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# GREEN BUILDING

## Federal Initiatives for the Nonfederal Sector Could Benefit from More Interagency Collaboration

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Highlights of [GAO-12-79](#), a report to the Subcommittee on Federal Financial Management, Government Information, Federal Services, and International Security, Committee on Homeland Security and Governmental Affairs, U.S. Senate

### Why GAO Did This Study

Economic, environmental, and health concerns have spurred interest in “green building”—construction and maintenance practices designed to make efficient use of resources, reduce environmental problems, and provide long-term financial and health benefits. Federal laws and executive orders direct agencies to meet green building standards in federal buildings and to foster green building in the nonfederal sector; the latter includes private, state, local, and tribal entities and accounts for the majority of the nation’s buildings.

GAO was asked to (1) identify current initiatives by federal agencies to foster green building in the nonfederal sector and (2) determine what is known about the results of these initiatives. As part of the review, GAO sent questionnaires to the 11 agencies implementing the initiatives identified, including the Departments of Energy (DOE) and Housing and Urban Development (HUD) and the Environmental Protection Agency (EPA); examined agency documents; and spoke with agency officials. GAO did not report funding data because officials stated that agencies do not track many green building funds separately.

### What GAO Recommends

GAO recommends that DOE, HUD, and EPA lead an effort to collaborate with other agencies on assessing the results of federal green building initiatives for the nonfederal sector. DOE, HUD, and EPA generally agreed with the recommendation, and HUD and other agencies provided technical clarifications, which GAO incorporated into the report as appropriate.

View [GAO-12-79](#) or key components. For more information, contact Frank Rusco at (202) 512-3841 or [ruscof@gao.gov](mailto:ruscof@gao.gov) or David J. Wise at (202) 512-2834 or [wised@gao.gov](mailto:wised@gao.gov).

## GREEN BUILDING

### Federal Initiatives for the Nonfederal Sector Could Benefit from More Interagency Collaboration

#### What GAO Found

GAO identified 94 federal initiatives—implemented by 11 agencies—that foster green building in the nonfederal sector. About two-thirds of these initiatives are implemented by HUD (29 initiatives), EPA (18), and DOE (17). According to GAO’s analysis of agency questionnaire responses, the initiatives vary in how they foster green building in the following ways:

- *Elements fostered.* All initiatives foster at least one of six green building elements GAO identified (see table). Three-quarters foster more than one element, and 21 initiatives across 7 agencies foster all six elements.
- *Direct or indirect fostering.* Over two-thirds (64) of the initiatives foster green building directly, and the rest foster green building as part of a broader effort that is focused not primarily on green building but on other purposes, such as expanding the supply of affordable housing for low-income elderly.
- *Type of assistance.* The initiatives provide multiple types of assistance, mostly through grants (47 initiatives) and technical assistance (45).
- *Recipients expected to benefit.* The direct beneficiaries identified by agencies range from individual property owners and renters to state governments.

About one-third of the initiatives have green building goals and performance measures; however, the overall results of most initiatives and their related investments are unknown. For example, according to HUD officials, to measure the results of the Green Retrofit Program for Multifamily Housing, HUD analyzes energy consumption data before and after retrofitting properties. Other agency officials reported various reasons for not having goals and measures, such as challenges in gathering reliable performance data. GAO identified some instances in which agencies have begun to collaborate to assess results but did not identify governmentwide collaboration on initiatives for the nonfederal sector. As GAO has reported, agencies and programs working collaboratively can often achieve more public value than when they work in isolation. Agencies with green building initiatives for the nonfederal sector may be missing opportunities to, among other things, reach agreement on governmentwide goals and measures for assessing the overall progress of their green building efforts.

**Federal Initiatives Fostering Green Building Elements in the Nonfederal Sector**

Green building element	Number of initiatives fostering each element
Energy conservation or efficiency	83
Indoor environmental quality	60
Water conservation or efficiency	51
Integrated design (collaborative planning at all stages of a building’s life)	48
Sustainable siting or location	43
Environmental impact of materials	39

Source: GAO analysis of questionnaire responses for 94 initiatives.

Note: Numbers total more than 94 because many initiatives foster more than one element.

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### Abbreviations

DOD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
ED	Department of Education
EPA	Environmental Protection Agency
GPRA	Government Performance and Results Act of 1993
HHS	Department of Health and Human Services
HUD	Department of Housing and Urban Development
IRS	Internal Revenue Service
LEED	Leadership in Energy and Environmental Design
NIST	National Institute of Standards and Technology
Recovery Act	American Recovery and Reinvestment Act of 2009
SBA	Small Business Administration
Treasury	Department of the Treasury
USDA	U.S. Department of Agriculture

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November 2, 2011

The Honorable Thomas R. Carper  
Chairman  
The Honorable Scott Brown  
Ranking Member  
Subcommittee on Federal Financial Management,  
Government Information, Federal Services,  
and International Security  
Committee on Homeland Security and Governmental Affairs  
United States Senate

Economic, environmental, and human health concerns have spurred interest in “green building”—construction and maintenance practices designed to make efficient use of resources, reduce environmental problems, and provide long-term financial and health benefits through lower annual operating costs and better indoor air quality. These practices are intended to help address issues posed by traditional commercial and residential construction and maintenance practices for buildings. According to the Department of Energy (DOE), in 2008, buildings in the United States consumed almost 40 percent of the nation’s energy and emitted about 39 percent of its carbon dioxide, a greenhouse gas recognized as a major contributor to climate change.<sup>1</sup> In addition, DOE reports that the approximately 30 million to 35 million tons of construction, renovation, and demolition waste produced annually in the nation accounts for about 24 percent of municipal solid waste, although as much as 95 percent of this waste could be recycled. Furthermore, according to the Environmental Protection Agency (EPA), exposure to indoor air pollutants, such as radon and formaldehyde, can lead to harmful health effects, from headaches to respiratory diseases.

In response to concerns about energy consumption, among other things, federal laws and executive orders have directed agencies to reduce energy consumption and meet other green building requirements in

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<sup>1</sup>Concentrations of greenhouse gases—including carbon dioxide, methane, nitrous oxide, and synthetic chemicals such as fluorinated gases—trap heat in the atmosphere and prevent it from returning to space.

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federally owned or leased buildings.<sup>2</sup> For buildings not subject to these requirements because they are owned or leased by private, state, local, or tribal entities, laws have also directed federal agencies to foster green building. In this report, we refer to these entities and their buildings as the “nonfederal sector,” which accounts for the majority of the nation’s buildings. For example, one provision of the Energy Independence and Security Act of 2007 created DOE’s Office of Commercial High-Performance Green Buildings to facilitate the development of green commercial buildings in partnership with other federal and nonfederal entities. In addition, agencies have initiated their own efforts to foster green building in the nonfederal sector. For example, as we reported in 2008, the Department of Housing and Urban Development (HUD) promotes green building in public housing and a small segment of multifamily properties by providing training and technical assistance; offering financial incentives to housing authorities for energy conservation measures; and leveraging resources through partnerships with DOE and EPA to expand the use of energy-efficient products in public and assisted housing.<sup>3</sup> In 2010, the U.S. Green Building Council and other sponsoring organizations in energy, housing, environment, and real estate identified existing federal authorities and programs they believed could be used to achieve green buildings for multifamily and commercial buildings.<sup>4</sup> In addition, a recent report by DOE’s Pacific Northwest National Laboratory

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<sup>2</sup>We have reported on agencies’ responses to these directives on several occasions. See GAO, *Federal Energy Management: Agencies Are Taking Steps to Meet High-Performance Federal Building Requirements, but Face Challenges*, [GAO-10-22](#) (Washington, D.C.: Oct. 30, 2009); *Status of GSA’s Implementation of Selected Green Building Provisions of the Energy Independence and Security Act of 2007*, [GAO-09-111R](#) (Washington, D.C.: Oct. 31, 2008); and *Federal Energy Management: Addressing Challenges through Better Plans and Clarifying the Greenhouse Gas Emission Measure Will Help Meet Long-term Goals for Buildings*, [GAO-08-977](#) (Washington, D.C.: Sept. 30, 2008).

<sup>3</sup>GAO, *Green Affordable Housing: HUD Has Made Progress in Promoting Green Building, but Expanding Efforts Could Help Reduce Energy Costs and Benefit Tenants*, [GAO-09-46](#) (Washington, D.C.: Oct. 7, 2008).

<sup>4</sup>The U.S. Green Building Council is a nonprofit organization that runs Leadership in Energy and Environmental Design (LEED), an internationally recognized green building certification system. Van Ness Feldman, P.C., et al., *Using Executive Authority to Achieve Greener Buildings: A Guide for Policymakers to Enhance Sustainability and Efficiency in Multifamily Housing and Commercial Buildings* (Washington, D.C.: Apr. 29, 2010).



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assessed agency programs related to one component of green building—energy efficiency—but not others.<sup>5</sup>

In this context, you asked us to review how the federal government is fostering green building in the nonfederal sector. Our objectives were to (1) identify current initiatives by federal agencies to foster green building in the nonfederal sector and (2) determine what is known about the results of these initiatives on fostering green building in the nonfederal sector.

To identify current initiatives by federal agencies to foster green building in the nonfederal sector, we reviewed (1) the Energy Independence and Security Act of 2007 requirements for a high-performance green building, (2) the U.S. Green Building Council's green building certification system, (3) the Green Globes assessment and rating system, (4) the Enterprise Community Partners green communities criteria, and (5) a 2006 memorandum of understanding signed by 19 federal agencies and offices to commit to leadership in the design, construction, and operation of high-performance and sustainable buildings.<sup>6,7</sup> From our review, we identified six generally recognized green building elements and a list of key terms based on these six elements. We searched federal documents, websites, and databases for initiatives with descriptions containing the terms and that were active during fiscal year 2011. On the basis of this search, we identified initiatives and the 11 agencies responsible for them. We spoke with officials at these agencies to confirm that the initiatives were current, and we asked the officials to identify other initiatives they were aware of

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<sup>5</sup>DOE, Pacific Northwest National Laboratory, *Federally Funded Programs Related to Building Energy Use: Overlaps, Challenges, and Opportunities for Collaboration* (Richland, Wash.: October 2010).

<sup>6</sup>Signatories include senior officials from the departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Homeland Security, Housing and Urban Development, the Interior, Justice, Labor, State, Transportation, and Veterans Affairs; the Environmental Protection Agency; the Executive Office of the President; the General Services Administration; the National Aeronautics and Space Administration; the Office of Personnel Management; and the Tennessee Valley Authority.

<sup>7</sup>We identified these five sources on the basis of background research and interviews with knowledgeable stakeholders from nonprofit groups and trade associations, who stated that these sources represent leading efforts to promote green building nationwide.

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that might fall within the scope of our objectives.<sup>8</sup> We then designed a questionnaire and submitted it to the agencies. For each initiative, the questionnaire asked agency officials to (1) confirm general information, (2) report funding, (3) identify goals and performance measures, and (4) provide other information to help understand the initiative. We received a questionnaire response for every initiative and conducted follow-up discussions with officials, as needed, to clarify responses and collect more data. To determine what is known about the results of these initiatives on fostering green building in the nonfederal sector, in addition to analyzing questionnaire data on goals and performance measures, we selected a subgroup of initiatives for which fostering green building is a primary goal. For this subgroup, we reviewed agency documents and interviewed officials about their progress on fostering green building in the nonfederal sector. We also visited projects receiving assistance from some of these initiatives and interviewed project managers, among others. During this review, we did not evaluate the effectiveness of green building initiatives, including the extent to which entities may or may not have received benefits, or the effectiveness of green building practices in general. We did not report questionnaire responses about funding because, during follow-up discussions, officials stated that, for many initiatives, green building funds are not tracked separately from other activities; therefore, we could not collect reliable funding data. We recognize that the initiatives may vary greatly in the scale of their funding or the number of entities expected to benefit, among other things; however, in this report, we do not discuss these differences or compare the scale of the initiatives we identified. A detailed description of our scope and methodology is presented in appendix I, and a copy of our questionnaire is presented in appendix IV.

We conducted this performance audit from September 2010 to November 2011 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe

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<sup>8</sup>The 11 agencies include the departments of Agriculture, Defense, Education, Energy, Health and Human Services, Housing and Urban Development, Transportation, and the Treasury; the Environmental Protection Agency; the National Institute of Standards and Technology; and the Small Business Administration.

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that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

Green building is the practice of designing, constructing, operating, maintaining, and removing buildings in ways that conserve natural resources and reduce pollution. There is no generally accepted definition for green building, but according to our analysis of various standards, it may incorporate one or more of the following six generally recognized elements:

- *energy conservation or efficiency measures*: the use of strategies to reduce energy consumption in a building or use renewable sources of energy;
- *indoor environmental quality measures*: the use of strategies to enhance indoor environmental quality through ventilation, control of pollution sources, and the use of low pollution-emitting materials;
- *water conservation or efficiency measures*: the use of strategies to reduce water consumption inside and outside the building;
- *integrated design principles*: the use of a collaborative planning and design process that involves a project team with a variety of stakeholders, such as architects, builders, and building engineers, who participate in all stages of a building's lifecycle, including planning, building, and operation;
- *sustainable siting or location measures*: the use of certain strategies when deciding on building location, including discouraging development on previously undeveloped land and minimizing a building's impact on the nearby ecosystem, among other things; and
- *measures to reduce the environmental impact of materials*: the use of strategies to reduce the environmental impact of materials, such as using sustainably grown materials and products with high recycled content, among other things.

Not having a generally accepted definition for green building has led to the development of several national and regional standards that builders and developers can use to certify whether a particular structure is a green building. These standards include the Leadership in Energy and Environmental Design (LEED) rating system—the most widely known

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standard—which was developed and is administered by the U.S. Green Building Council.<sup>9</sup> Many of these standards use a system that assigns points for a variety of practices and certifies a building at various levels of “green” depending on the number of points acquired.

The federal government has long shown an interest in promoting green building practices in buildings owned or leased by federal agencies. For example, the Energy Policy Act of 1992 contains efficiency requirements for the use of energy and water in federal buildings.<sup>10</sup> Furthermore, the federal Interagency Sustainability Working Group was formed under DOE’s Interagency Energy Management Task Force in 2001 in response to an executive order to, among other things, serve as a forum and develop policy and technical guidance to promote green building for federally owned, operated, and leased buildings. The group is coordinated by DOE and consists of approximately 60 active members, including at least one representative from every major federal department and agency.

More recently, the federal government has also focused on promoting green building practices in the nonfederal sector. For example, the Energy Policy Act of 2005 provided tax credits for home improvements that increase energy efficiency and tax deductions for commercial buildings that meet specific efficiency standards; the Energy Independence and Security Act of 2007 authorized \$1.52 billion over 10 years, starting in fiscal year 2008, for DOE’s efforts to promote commercial green building in partnership with other federal, as well as nonfederal, entities; and the American Recovery and Reinvestment Act of 2009 (Recovery Act) provided at least \$13 billion to foster green building in the nonfederal sector through various agency initiatives, such as DOE’s Weatherization Assistance Program—which is designed to make long-

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<sup>9</sup>In 2008, we identified several examples of national and regional green building standards for commercial, single-family, and multifamily properties. In addition to LEED, other examples of national green building standards include EPA’s Energy Star for Qualified Homes, Enterprise Community Partners’ Green Communities Criteria, and the National Association of Home Builders’ Model Green Home Building Guidelines. Examples of regional green building standards include the Greater Atlanta Home Builders Associations & Southface Energy Institute’s EarthCraft House, Washington Department of Economic Development and Trade’s Evergreen Sustainable Development Criteria, and the Seattle Office of Housing’s SeaGreen Guidelines. See [GAO-09-46](#).

<sup>10</sup>Pub. L. No. 102-486, § 152, 106 Stat. 2776, 2884 (1992).

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term energy-efficiency improvements to the homes of low-income families.<sup>11</sup> Weatherization includes installing high-efficiency boilers, insulation, and energy-efficient windows.<sup>12</sup>

The Government Performance and Results Act of 1993 (GPRA) provides tools that agencies can use to assess the results of their activities, including efforts that foster green building.<sup>13</sup> Under GPRA, federal agencies are required to develop strategic plans with long-term, outcome-oriented goals and objectives, annual goals linked to achieving the long-term goals, and annual reports on the results achieved. Principles of good governance also indicate that agencies should establish quantifiable performance measures to demonstrate how they intend to achieve their program goals and measure the extent to which they have done so.<sup>14</sup> These measures should allow agencies to compare their programs' actual results with desired results and should be linked to program goals. Moreover, as we have reported, GPRA, with its focus on strategic planning, the development of long-term goals, and accountability for results, provides a framework that Congress, the Office of Management and Budget, and executive branch agencies can use to consider the appropriate mix of long-term strategic goals and strategies needed to identify and address federal goals that cut across agency boundaries. For example, we have reported that the strategic and annual performance planning processes under GPRA provide opportunities for federal agencies to identify other agencies addressing related outcomes and coordinate with agencies across the government to ensure that program goals are complementary; strategies are mutually reinforcing; and, as appropriate, common performance measures are used.<sup>15</sup> To this end,

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<sup>11</sup>American Recovery and Reinvestment Act of 2009. Pub. L. No. 111-5, 123 Stat. 115 (2009).

<sup>12</sup>According to EPA information, the ability of insulation to resist heat is measured by its R-Value. The higher the R-Value, the better the insulation is designed to perform.

<sup>13</sup>Pub. L. No. 103-62, 107 Stat. 285 (1993).

<sup>14</sup>GAO, *Agencies' Annual Performance Plans under the Results Act: An Assessment Guide to Facilitate Congressional Decisionmaking*, [GAO/GGD/AIMD-10.1.18](#) (Washington, D.C.: February 1998); and *The Results Act: An Evaluator's Guide to Assessing Agency Annual Performance Plans*, [GAO/GGD-10.1.20](#) (Washington, D.C.: April 1998).

<sup>15</sup>GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.: Oct. 21, 2005).

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under the GPRA Modernization Act of 2010, agencies will be required to adopt a more coordinated and crosscutting approach to achieving common goals and will be required to describe in their fiscal year 2012 performance plans, and each fiscal year thereafter, how they are coordinating and collaborating with other agencies to achieve the plans' goals.<sup>16</sup>

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## Agencies Foster Green Building in the Nonfederal Sector through More Than 90 Initiatives, Primarily for Energy Conservation or Efficiency

We identified 94 federal initiatives that foster green building in the nonfederal sector; these initiatives, implemented by 11 agencies, vary in how they foster green building, including which elements of green building they foster, whether fostering green building is a primary purpose of the initiative, what types of assistance they provide, and what groups are expected to benefit. Furthermore, some of these initiatives are required by statute, while others are being implemented under agencies' discretionary authority. A description and other information for each initiative are presented in appendixes II and III.

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## Eleven Agencies Foster Green Building in the Nonfederal Sector, Most Commonly through Energy Conservation or Efficiency

Table 1 shows the 11 federal agencies implementing the 94 green building initiatives we identified. As table 1 indicates, 3 of the 11 agencies fostering green building in the nonfederal sector—HUD, EPA, and DOE—are implementing most (about two-thirds) of these initiatives.

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<sup>16</sup>Pub. L. No. 111-352, 124 Stat. 3866 (2011).

**Table 1: Number of Initiatives That Foster Green Building in the Nonfederal Sector, by Federal Agency**

Agency	Number of initiatives
HUD	29
EPA	18
DOE	17
U.S. Department of Agriculture	8
Department of the Treasury	8
Department of Transportation	5
National Institute of Standards and Technology	3
Department of Education	2
Small Business Administration	2
Department of Defense	1
Department of Health and Human Services	1
<b>Total</b>	<b>94</b>

Source: GAO analysis of agency information and questionnaire responses.

We examined the 94 initiatives by (1) the type of green building elements they foster, (2) whether they foster green building directly or indirectly as part of a broader effort, (3) the type of assistance they provide, and (4) the recipients expected to directly benefit from the assistance.

Type of Green Building Elements Fostered

Many of the initiatives we identified foster multiple elements of green building. Table 2—which shows the green building elements fostered by the 94 initiatives—indicates that energy conservation or efficiency is the most commonly fostered element of green building.

**Table 2: Initiatives Fostering Green Building Elements in the Nonfederal Sector**

Green building element	Number of initiatives fostering each element
Energy conservation or efficiency	83
Indoor environmental quality	60
Water conservation or efficiency	51
Integrated design	48
Sustainable siting or location	43
Environmental impact of materials	39

Source: GAO analysis of questionnaire responses.

Note: Numbers total more than 94 because many initiatives foster more than one element.

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All 11 agencies reported implementing initiatives that foster green building through the energy conservation or efficiency element. For example, DOE's Tribal Energy Program offers financial and technical assistance to Indian tribes to help them evaluate and develop methods to reduce their energy consumption through energy efficiency and weatherization of buildings. This program also provides education and training opportunities to develop and implement energy-efficiency and renewable-energy projects. In addition, the tax code offers the Energy Investment Tax Credit—implemented by the Department of the Treasury's (Treasury) Internal Revenue Service (IRS)—which provides tax credits to businesses for certain qualified renewable-energy and energy-efficiency technologies. This program includes incentives for combined heat and power investment and for fuel cells and microturbines. However, the agencies reported that most initiatives fostering green building through the energy conservation or efficiency element also foster green building through one or more additional elements. For example, the National Institute of Standards and Technology's (NIST) Improved Building Energy Performance Program is intended to develop better tools for accurately evaluating a building's energy consumption and indoor air quality after it is constructed.

According to our analysis of questionnaire responses, about three-quarters of the 94 initiatives foster green building through more than one element, including 21 initiatives across seven agencies that foster green building through all six green building elements. For example, through the Tribal Green Building Initiative, EPA is working with tribal and federal partners to advance tribes' efforts to adopt building codes related to green building and to address barriers associated with developing and implementing these codes. The initiative supports tribal building codes that reduce energy and water use, improve indoor air quality, use nontoxic building materials, and conserve other resources—all of which touch on the six elements of green building. In addition, HUD's Green Retrofit Program for Multifamily Housing makes loans and grants for retrofits (i.e., the addition of new technology or features to older systems) that foster any or all of the green building elements in certain HUD-assisted multifamily buildings.

## Direct or Indirect Fostering of Green Building

According to our analysis, over two-thirds (64) of the 94 initiatives foster green building directly—that is, one of their primary purposes is to foster green building through one or more green building elements. For example, EPA's Indoor Environments Program is intended to provide resources to promote and protect occupants' health while saving energy and money. These resources include Indoor Air Quality Tools for Schools, a program whose goal is to help schools establish and maintain a healthy



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environment in school buildings by providing guidance, training, checklists, and other resources to identify, correct, and prevent indoor air quality problems; and the Radon Program, which is intended to promote radon-resistant construction techniques for new homes and to educate the public on radon testing and mitigation technologies in existing homes.

The remaining 30 initiatives foster green building indirectly—that is, as part of a broader effort not primarily focused on green building. For example, HUD’s Supportive Housing for the Elderly (Section 202) program is intended to expand the supply of affordable housing with services for the low-income elderly by providing them with options for independent living in an environment with support activities, such as cleaning, cooking, and transportation. HUD seeks to accomplish this purpose by providing interest-free capital advances to private and nonprofit sponsors to finance development of the housing. To support HUD’s strategic goal of reducing energy consumption, however, HUD requires applicants seeking Section 202 funding for new construction and substantial rehabilitation projects to include energy efficiency and water conservation strategies. In addition, HUD requires pre- and post-construction energy audits for other types of rehabilitation projects funded through the Section 202 program.

#### Type of Assistance Provided

Agencies reported that many of the 94 initiatives foster green building by providing multiple types of assistance, most commonly through grants or technical assistance, as shown in table 3. Technical assistance can take many forms, including technical guidance and expert advice; tools to evaluate performance against green building metrics; education on the benefits of green building; and work with organizations and end users to develop strategies to achieve their green building goals.

**Table 3: Initiatives That Foster Green Building in the Nonfederal Sector, by Type of Assistance Provided**

Type of assistance provided	Number of initiatives providing each type
Grants	47
Technical assistance	45
Other <sup>a</sup>	22
Research and development	21
Contracts	16
Direct loans	9
Mortgage-related assistance	6
Tax credits	5
Rent subsidies	4
Tax deductions	3

Source: GAO analysis of questionnaire responses.

Notes: Numbers total more than 94 because many initiatives provide more than one type of assistance.

<sup>a</sup>Other types of assistance—as marked in questionnaire responses—include, for example, websites to disseminate information and direct-to-consumer rebates.

Agencies reported providing grants for different purposes related to green building. For example, DOE’s Energy Efficiency and Conservation Block Grant is intended to assist U.S. cities, counties, states, territories, and Indian tribes to develop, promote, implement, and manage energy efficiency and conservation projects for buildings, among other things. In addition, the Small Business Administration’s (SBA) Small Business Energy Audit and Energy Efficiency Program makes grants to Small Business Development Centers—partnerships primarily between the federal government and colleges and universities—to provide green building-related training to small businesses. Also, the Department of Transportation’s (DOT) Transit Investments for Greenhouse Gas and Energy Reduction Program is intended to provide grants to public transit agencies to implement new strategies to reduce greenhouse gas emissions or reduce energy usage from their operations.

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Recipients Expected to Directly Benefit

Agencies reported that the 94 initiatives are expected to directly benefit a variety of recipients and can directly benefit multiple recipients, as shown in table 4.

**Table 4: Recipients That Agencies Expect to Directly Benefit from Initiatives Fostering Green Building in the Nonfederal Sector**

Recipients expected to directly benefit	Number of initiatives expected to provide direct benefits
Individual property owners or renters	55
Local governments	49
Businesses	47
Nonprofit organizations	45
State governments	42
Other <sup>a</sup>	36
Public housing agencies	35

Source: GAO analysis of questionnaire responses.

Notes: Numbers total more than 94 because agencies expect some initiatives to benefit multiple recipients.

<sup>a</sup>Other recipients—marked Other in questionnaire responses—include, for example, tribal governments, metropolitan planning organizations, U.S. territories, public transit agencies, and water and wastewater utilities.

As table 4 indicates, the types of recipients that agencies reported expecting to directly benefit from these initiatives range widely. For example, under IRS’s Energy Efficient Commercial Buildings Deduction, businesses can claim a tax deduction for equipment that reduces energy costs in buildings associated with lighting systems; building envelopes;<sup>17</sup> and heating, cooling, ventilation, and hot water systems. In addition, through the Sustainable Community Challenge Planning Grants Program, HUD makes funds available to state and local governments, tribal governments, and other entities to, among other things, promote green building and revise their building codes to allow for more energy-efficient rehabilitation of older buildings. Furthermore, through the WaterSense program, EPA partners with local water utilities, local governments, product manufacturers, retailers, and consumers to promote water-efficient products and practices, which can benefit a wide variety of

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<sup>17</sup>According to DOE documentation, a building envelope includes a building’s walls, roofs, floors, windows, and doors.

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recipients—including individual property owners, state and local governments, public housing agencies, and businesses. Products and new homes can earn the WaterSense label by being independently certified to meet EPA’s criteria for efficiency and performance. For example, WaterSense-labeled plumbing fixtures reportedly use at least 20 percent less water and perform as well or better than standard models.

Recipients of some of these initiatives told us that these initiatives provide indirect benefits as a result of the money saved through green building retrofits. For example, officials representing two apartment complexes we visited said they are able to use the money saved to offer additional services to their tenants that improve their quality of life. One official stated these additional services include after-school programs and dental services.

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### Some Agency Efforts to Foster Green Building Are Required by Statute

According to our analysis of questionnaire responses, agencies are implementing many of the initiatives we identified because they are required to by statute. For example, the Energy Independence and Security Act of 2007 directed DOE to conduct outreach activities to inform the public about education resources, technical assistance, or other forms of assistance useful in planning and constructing high-performance green building. DOE officials stated that they are implementing the Commercial Building Initiative because of this requirement. According to DOE, this initiative is intended to improve the energy efficiency of new and existing commercial buildings by researching technologies, strategies, and tools that improve energy savings and by working with commercial building owners and operators to ensure these technologies are market ready.

In addition, EPA’s Brownfields Program—required by the Small Business Liability Relief and Brownfields Revitalization Act—provides financial and technical assistance intended to encourage states, communities, and other stakeholders to prevent, assess, safely clean up, and reuse brownfields, which are properties where reuse may be complicated by the potential presence of a hazardous substance, pollutant, or contaminant. By reusing brownfields, this program, among other things, is attempting to encourage economic activity on previously developed land rather than on undeveloped land, according to an EPA official.

Furthermore, USDA’s Rural Energy for America Program—required by the Food, Conservation, and Energy Act of 2008—promotes energy efficiency and renewable energy for agricultural producers and rural small businesses through the use of (1) grants and loan guarantees for energy-

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efficiency improvements and renewable-energy systems and (2) grants for energy audits and renewable energy development assistance.

According to our analysis of questionnaire responses, agencies are also using their discretionary authority to implement some of the initiatives we identified. For example, EPA's Green Infrastructure Program is intended to promote cost-effective strategies for storm-water management, including using rain gardens, porous pavements, green roofs, trees and tree boxes, and rainwater harvesting for nonpotable uses such as landscape irrigation. In addition, DOE's Superior Energy Performance Program is a certification program intended to provide managers of industrial and commercial buildings with guidance on how to achieve continual improvement in energy efficiency while maintaining competitiveness. The program is intended to provide a transparent, globally accepted system for verifying energy performance improvements and management practices.

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## The Overall Results of Federal Green Building Initiatives in the Nonfederal Sector Are Unknown

About one-third of the federal initiatives we identified have green building goals and performance measures; therefore, the overall results of most initiatives and their related investments are unknown. Agency officials provided several reasons for not having performance information on the results of most green building initiatives for the nonfederal sector. To assess initiatives' results, some agencies have begun to collaborate, but we did not identify any broader, or governmentwide, efforts to collaborate on assessing the results of these initiatives in the nonfederal sector.

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## Some Initiatives Have Green Building Goals and Performance Measures

According to our analysis of questionnaire responses, about one-third of the 94 federal initiatives we identified that foster green building in the nonfederal sector had goals and performance measures specific to green building. Following are two examples:

- Under the Recovery Act, HUD established the Green Retrofit Program for Multifamily Housing, which makes grants or loans to owners of residential assisted housing for energy retrofit or other green investments.<sup>18</sup> According to HUD officials and our review of program

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<sup>18</sup>Public housing under HUD's purview is commonly considered to be in the federal sector, but for the purposes of this review, because the buildings are privately owned and not subject to the same energy efficiency and other green building requirements that federal buildings face, we have included them in the nonfederal sector.

### Energy Retrofit at Castle Square Apartments



Source: Pinck & Co., Inc.

Energy-efficiency improvements, including the exterior shell, being made to Castle Square Apartments.

The owners of Castle Square Apartments in Boston secured a mix of federal, private, and Recovery Act funds to retrofit 500 low-income family apartments—a mixture of 192 midrise and 308 garden apartments—with energy-efficiency improvements. The owners received a \$6.7 million loan under HUD's Green Retrofit Program and a \$4.4 million grant from the state under DOE's State Energy Program. The midrise apartment retrofits will include an insulated exterior shell (R-40), an insulated reflective roof (R-40), and high-efficiency windows (R-5); together, the retrofits are expected to increase the insulation value of the midrise buildings by about 600 percent, according to the private development official we spoke with. According to the official, the funds committed by DOE were used for the exterior shell, which made possible additional energy improvements—such as the use of smaller boilers that consume less energy to heat the apartments—that would not have been possible without the shell improvements. Other retrofits include high-efficiency air conditioning units, solar thermal panels to preheat boiler water, and bathroom and kitchen exterior exhaust systems for improved indoor air quality.

For the 308 garden apartments without the exterior shell, the majority owner of the apartments expects energy savings of 48 percent. In their Green Retrofit Plan agreement with HUD, the owners committed to provide tenant release forms that authorize HUD to collect utility consumption data from utility providers, which HUD may request to assess results through postrehabilitation studies. According to our review of questionnaire responses, HUD is collecting utility consumption data for each participating property before and after the retrofits to compare the data, calculate savings, and evaluate the effectiveness of the program.

requirements and documents, HUD measures this initiative's progress toward green building goals by collecting energy consumption data for participating properties before and after they are retrofitted and plans to compare these data to calculate savings and evaluate effectiveness. The Castle Square Apartments in Boston received assistance under this initiative. Once completed, the project's 192 midrise apartments will reduce energy consumption by 72 percent, according to estimates by HUD officials and the private developer.

- DOE's Energy Efficiency and Conservation Block Grant Program is a \$3.2 billion Recovery Act program that makes grants to cities, counties, states, territories, and Indian tribes to develop and implement energy efficiency and conservation projects for buildings, among other things. DOE officials stated that the program has implemented projects in more than 16,000 buildings. For example, according to DOE's response to our questionnaire, the city of San Francisco used these funds to help multifamily residential property owners replace aging, inefficient boiler systems. Also, according to its response, DOE has established project management milestones and goals for the program that measure overall progress. DOE officials told us the program has no official green building targets, and grant recipients determine their own green building goals, such as the amount of building space they want to retrofit. According to its questionnaire response, DOE strongly encourages, but does not require, grant recipients conducting green building activities to perform industry-standard measurement and verification of their projects to track performance on key metrics such as energy savings and emissions reductions. To accomplish this purpose, DOE has issued optional guidance for grant recipients on program evaluation and has provided resources and training on suggested methods for recipients to estimate energy savings and collect data.

As we have reported, leading organizations commonly define clear goals and related outcomes, measure performance to gauge progress, and use performance information to assess the results of their efforts and the related investment.<sup>19</sup> Leading organizations recognize, as well, that performance measures can create powerful incentives to influence

<sup>19</sup>GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, GAO/GGD-96-118 (Washington, D.C.: June 1996).

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organizational and individual behavior. When resources are limited and public demands are high, it is particularly important that agencies are accountable to Congress, the executive branch, and the public for the results of their activities and investments. In the federal sector, agencies are required to meet green building goals for energy and water efficiency, among other things. Federal agencies are also required to measure and report to DOE the progress they have made meeting federal green building goals. DOE, in turn, uses this information to report annually to Congress on agencies' energy use and progress toward meeting federal green building goals.

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### Agency Officials Provided Reasons for Not Having Performance Information on the Results of Green Building

Agency officials provided various reasons for not having performance information on the results of green building initiatives for the nonfederal sector. For example, some agency officials said that many of the initiatives we identified have a broader focus than green building and may have performance goals and measures but not ones specific to green building. Therefore, key performance information related to green building is often not available. For instance, the HUD Supportive Housing for the Elderly (Section 202) program is designed to help expand the supply of affordable housing with services for the low-income elderly by providing them with options for independent living in a supportive environment. According to our analysis of questionnaire responses and program documents supplied by HUD, in fiscal year 2010, HUD incorporated green building into this program by establishing both minimum requirements as well as incentives for, among other things, energy efficiency and water conservation practices for these properties. In addition, Department of Defense (DOD) officials told us that the main goal of DOD's Environmental Security Technology Certification Program is to evaluate the cost-effectiveness and suitability of energy technologies that could help DOD meet mandated reductions in energy use. DOD officials said that the program has no overall goals specific to green building; instead, individual demonstration projects under the program use goals and performance measures specific to those projects. The officials stated that it would not be appropriate for DOD to expend the funds needed to assess the extent to which any of the technologies developed affect green building.

In addition, agencies reported that they may not have information on the results of green building initiatives for the nonfederal sector, in part, because they face several challenges in gathering and analyzing appropriate and reliable performance data. A 2011 industry report identified several challenges in gathering utility usage data for multifamily properties, including difficulty in obtaining the resources necessary to develop systems

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for accurate data collection, a lack of industry standards for performance data collection, and utility companies' diverse policies governing data sharing, as well as their wide-ranging capacities to collect data.<sup>20</sup> HUD officials told us the quality of utility data can vary by utility, especially for water consumption data—which can be incomplete and inaccurate and is often not available in electronic form. In addition, the results of some green building elements are more easily measured than others. For example, a General Services Administration official we interviewed testified before Congress in 2010 that it is easier to compare before and after utility consumption data (water or energy conservation or efficiency) than to measure indoor environmental air quality or the impact a building's siting has on transportation.<sup>21</sup> However, several federal and local agencies and entities we reviewed reported making progress toward overcoming data gathering and reporting challenges through better use of technology. For example, officials at the Cambridge Housing Authority in Massachusetts told us that they are developing an electronic billing system and installing the technology necessary to collect and track utility usage.<sup>22</sup> They said they anticipate being able to use the system to generate quantitative energy reports—a major step toward accurately measuring, analyzing, and reporting energy consumption in the housing authority's buildings.

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<sup>20</sup>Todd Trehubenko and Deidre Schmidt, *Multifamily Utility Usage Data: Issues and Opportunities* (Boston, Mass., June 16, 2011), prepared for Living Cities.

<sup>21</sup>*Green Building Practices in the Federal Sector: Progress and Challenges to Date*, 111th Cong. 16 (2010) (statement of Kevin Kampschroer, Director, Office of Federal High-Performance Green Buildings, U.S. General Services Administration).

<sup>22</sup>Cambridge Housing Authority participates in HUD's Moving to Work demonstration program, which allows public housing authorities to design and test innovative, locally designed housing strategies for low-income residents. Cambridge Housing Authority is one of about 12 housing authorities that, under the program, can seek exemptions from existing rules and provide utility subsidies to residents based on utility consumption levels "frozen" when they signed their agreement with HUD. If resident utility consumption drops due to energy savings investments made by the housing authority, HUD's subsidy will not decrease, and housing authorities can retain any of the difference between the "frozen" subsidy and residents' lower utility consumption costs.



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Agencies Have Begun to Collaborate to Assess Results for Some Initiatives, but without Apparent Governmentwide Collaboration to Assess Overall Results

We identified some instances in which agencies are collaborating on specific initiatives, including establishing compatible procedures and adopting common performance measures for assessing results. As we have previously reported, achieving results for the nation increasingly requires that federal agencies work together to identify ways to deliver results more efficiently and in a way that is consistent with their multiple demands and limited resources.<sup>23</sup> Agencies and programs working collaboratively can often achieve more public value than when they work in isolation. We have also identified key practices that can help enhance and sustain such federal agency collaboration.<sup>24</sup>

We found instances in which agencies used some of these key practices, including establishing compatible procedures and adopting common performance measures for assessing results, when working together on specific initiatives that cut across agencies. For example, under the Partnership for Sustainable Communities, DOT, EPA, and HUD collaborated on a number of grant and technical assistance initiatives, including recently developing guidance for HUD's Community Challenge Planning Grants Program. This program makes funds available to state and local governments, tribal governments, and other entities to promote affordable, economically vital, and sustainable communities through green building and a variety of other eligible activities, including developing building codes that promote the energy-efficient rehabilitation of older buildings to create affordable and healthy housing. According to earlier guidance, the agencies plan to adopt a common set of performance measures for this and other related initiatives, but the more recent guidance does not define these measures.<sup>25</sup> Also, through the

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<sup>23</sup>[GAO-06-15](#).

<sup>24</sup>Such practices include (1) define and articulate a common outcome; (2) establish mutually reinforcing or joint strategies; (3) identify and address needs by leveraging resources; (4) agree on roles and responsibilities; (5) establish compatible policies, procedures, and other means to operate across agency boundaries; (6) develop mechanisms to monitor, evaluate, and report on results; (7) reinforce agency accountability for collaborative efforts through agency plans and reports; and (8) reinforce individual accountability for collaborative efforts through performance management systems. See [GAO-06-15](#).

<sup>25</sup>The 2009 DOT-EPA-HUD partnership established a framework of principles that the agencies can use to coordinate federal housing, transportation, and environmental investments, as well as promote public health and the environment.

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Partnership for Sustainable Communities, DOT and HUD coordinated to accept a single application for their respective transportation and community planning grant programs that, according to agency documents, made it easier for communities to apply to both programs simultaneously.<sup>26</sup> HUD officials told us that, other than through the Partnership for Sustainable Communities, they typically coordinate on green building on a targeted basis with DOE and EPA. According to these officials, HUD has collaborated with EPA on the adoption of the Energy Star standard in HUD programs.<sup>27</sup> In addition, according to these officials, HUD established an active partnership with DOE on the implementation of the Recovery Act-funded Weatherization Assistance Program, as well as on elements of the Energy Efficiency and Conservation Block Grant Program.

Furthermore, DOE chairs the Interagency Energy Management Task Force, a group of agency headquarters energy managers who, among other things, address energy issues affecting federal buildings and operations. The task force includes 10 of the 11 agencies implementing the initiatives in our review and establishes working groups for specific issues—including green building—across federal agencies. Since 1988, this task force has served as the interagency group for collaborating on green building in the federal sector, measuring progress, and acting as a forum for addressing challenges to green building and developing common solutions for the federal sector. For example, one of the task force's working groups sought EPA's expertise in storm-water management to respond to new requirements in the Energy Independence and Security Act of 2007. EPA developed and provided guidance that other agencies could use in meeting the new requirements.

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<sup>26</sup>These programs include DOT's Transportation Investment Generating Economic Recovery Discretionary Grant Program and HUD's Community Challenge Planning Grants.

<sup>27</sup>Energy Star is a voluntary program that EPA began in 1992 to encourage the purchase of energy-efficient computers and monitors as part of the agency's broader efforts to reduce greenhouse gas emissions. Since 1996, EPA has shared management responsibilities for the program with DOE. The program is designed to identify appliances and other products that deliver the same or better performance as comparable models while using less energy.

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However, we did not identify a governmentwide effort to collaborate on green building issues, including shared goals and common performance measures, for the nonfederal sector that is comparable to the task force's efforts for the federal sector. Without such an effort, agencies may be missing opportunities to, among other things, reach agreement on governmentwide goals and measures for assessing the overall progress of their efforts to foster green building in the nonfederal sector.

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## Conclusions

The federal government has launched a variety of initiatives to promote green building in the nonfederal sector—the vast majority of the nation's building stock. These initiatives are intended to reach many types of beneficiaries, ranging from individual renters and homeowners to state governments. In some cases, agencies have measured progress for individual initiatives and have collaborated on initiatives across agencies, including identifying shared goals and adopting common performance measures for assessing results. However, the overall effect of these initiatives on the nation's nonfederal buildings is unknown because agencies have largely not assessed either the individual or the combined results of green building initiatives in the nonfederal sector or the related investments. In contrast, the federal government has been measuring, and reporting on, its progress in making federal buildings greener. Because federal agencies have experience with measuring progress in the federal sector, they are well-positioned to apply this experience to measuring such progress in the nonfederal sector, as well. In addition, DOE's Interagency Energy Management Task Force has served as an agency forum for 10 of the 11 agencies implementing the initiatives to discuss challenges to green building and develop common solutions for the federal sector. However, we did not identify a similar governmentwide effort among the 11 agencies to collaborate on green building in the nonfederal sector. Without comprehensive information about individual initiatives' effects on fostering green building, and without collaboration across federal agencies to establish green building goals and ways to measure progress, Congress, agency heads, and the public—including potential beneficiaries of federal initiatives—have incomplete information about the effectiveness of individual and overall federal efforts to foster green building in the nonfederal sector.

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## Recommendation for Executive Action

To help assess the results of investments in individual federal initiatives to foster green building in the nonfederal sector, as well as their combined results, we recommend that the Secretaries of Energy and of Housing and Urban Development work with the Administrator of EPA in leading an effort with other agencies that are implementing green building initiatives

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to collaborate on identifying performance information, such as shared goals and common performance measures, for green building initiatives for the nonfederal sector. This effort should include, if necessary, an exploration of the need for additional legislative or executive authority, such as the authority to establish a coordinating entity (e.g., an interagency working group).

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## Agency Comments

We provided a draft of this report for review and comment to the U.S. Department of Agriculture (USDA), DOD, the Department of Education (ED), DOE, the Department of Health and Human Services (HHS), HUD, and DOT, as well as EPA, IRS, NIST, and SBA. In written comments, reproduced in appendix V, DOE generally agreed with our recommendation. In written comments, reproduced in appendix VI, HUD stated that it welcomes our recommendation and provided technical clarifications, which we incorporated into the report as appropriate. On October 17, 2011, USDA provided comments in an e-mail message, stating that it generally concurred with the information applicable to its Rural Development programs. USDA also provided technical clarifications, which we incorporated into the report as appropriate. On October 20, 2011, DOD provided comments in an e-mail message, stating that it concurred with the draft report as written. On October 21, 2011, EPA provided comments in an e-mail message, stating that it generally agreed with our findings, conclusions, and recommendation. In particular, EPA stated that it believes significant benefits could be achieved by identifying information on performance for green building efforts in the nonfederal sector across federal agencies and that our recommendation supports the GPRA Modernization Act of 2010. DOT, ED, IRS, and SBA did not provide formal written comments but provided technical clarifications, which we incorporated into the report as appropriate. In its technical clarifications, ED noted the announcement of its new Green Ribbon Schools Initiative, which is being implemented in fiscal year 2012. According to ED, the initiative resulted from cooperative efforts made with other federal agencies, state and local school officials, and other potential stakeholders. ED also stated that the initiative's preparation work and announcement is already having a positive impact on the "efforts of state and local officials to recognize the exemplary efforts of schools and communities to be energy conscious, promote healthy and sustainable environments, and educate students to become environmentally literate citizens." HHS and NIST stated that they did not have any comments on the draft report.

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As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the Secretaries of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, Housing and Urban Development, and Transportation; the Administrators of EPA and SBA; the Commissioner of Internal Revenue; the appropriate congressional committees; and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact Frank Rusco at (202) 512-3841 or [ruscof@gao.gov](mailto:ruscof@gao.gov) or David J. Wise at (202) 512-2834 or [wised@gao.gov](mailto:wised@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix VII.



Frank Rusco  
Director  
Natural Resources and Environment



David J. Wise  
Director  
Physical Infrastructure

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# Appendix I: Scope and Methodology

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Our objectives were to (1) identify current initiatives by federal agencies to foster green building in the nonfederal sector and (2) determine what is known about the results of these initiatives on fostering green building in the nonfederal sector. For the purposes of this review, the nonfederal sector includes private, state, local, and tribal entities.

To identify current initiatives by federal agencies to foster green building in the nonfederal sector, we first developed a working definition of green building, which often varies, depending on the stakeholder. To develop the definition, we reviewed and analyzed five sources for key elements of a green building: (1) the requirements for a high-performance green building in the Energy Independence and Security Act of 2007, (2) the U.S. Green Building Council's green building certification system,<sup>1</sup> (3) the Green Globes assessment and rating system,<sup>2</sup> (4) the Enterprise Community Partners green communities criteria,<sup>3</sup> and (5) a memorandum of understanding signed by many federal agencies to commit to federal leadership in the design, construction, and operation of high-performance and sustainable buildings.<sup>4</sup> We identified these five sources on the basis of background research and interviews with knowledgeable stakeholders from the following nonprofit groups and trade associations: the Building Owners and Managers Association International, the Housing Assistance

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<sup>1</sup>The U.S. Green Building Council is a nonprofit organization that developed and runs Leadership in Energy and Environmental Design (LEED)—an internationally recognized green building certification system.

<sup>2</sup>The Green Globes assessment and rating system is used in Canada and the United States. In the United States, the license to promote and further develop the Green Globes system is owned by the Green Building Initiative, which is an accredited standards developer under the American National Standards Institute—the only accreditor of U.S. voluntary consensus standards developing organizations.

<sup>3</sup>Enterprise Community Partners is a nonprofit organization that provides development capital and expertise to create affordable homes and rebuild communities through public-private partnerships with financial institutions, governments, community organizations, and others.

<sup>4</sup>*Federal Leadership in High Performance and Sustainable Buildings, Memorandum of Understanding* (January 2006). Signatories include senior officials from the Departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Homeland Security, Housing and Urban Development, the Interior, Justice, Labor, State, Transportation, and Veterans Affairs; the Environmental Protection Agency; the Executive Office of the President; the General Services Administration; the National Aeronautics and Space Administration; the Office of Personnel Management; and the Tennessee Valley Authority.

Council, the International Facility Management Association, the National Housing Trust, the National Institute of Building Sciences' High Performance Building Council, Neighborworks America, the Public Housing Authorities Directors Association, and the U.S. Green Building Council. Knowledgeable stakeholders from these organizations stated that these sources represent leading efforts to promote green building nationwide. From our analysis of these sources, we determined that, for the purposes of this report, a "green building" is a building that, through its design, construction, rehabilitation, operation, or maintenance, incorporates one or more of the following six elements: (1) integrated design principles, (2) energy conservation or efficiency measures, (3) water conservation or efficiency measures, (4) indoor environmental quality measures, (5) measures to reduce the environmental impact of materials, and (6) sustainable siting or location measures.<sup>5</sup>

With this definition of a green building, we then developed a list of key terms and used them to search a broad range of sources for federal initiatives with descriptions containing any of the terms. The sources we searched primarily included federal agency budget justifications, program websites, and databases. We also searched *Federal Register* announcements, agencies' news releases, and strategic planning documents. We analyzed each initiative identified through this process to determine whether it fell within the scope of our objectives, including whether it was active anytime during fiscal year 2011, and through this analysis, we developed a list of initiatives organized by agency.<sup>6</sup> We confirmed these initiatives with officials at the federal agencies with roles in implementing the initiatives, and we asked the officials to identify other initiatives they were aware of that might fall within the scope of our

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<sup>5</sup>During this review, we did not evaluate the overall effectiveness of green building practices in general or the effectiveness of any of the six green building elements that we identified.

<sup>6</sup>We defined federal initiatives that could foster green building to include those that provide direct financial support, research and development, technical assistance, or other types of federal assistance to nonfederal entities for promoting green building. Our review does not include federal initiatives, such as the Low Income Housing Tax Credit implemented by the Internal Revenue Service, through which state or local authorities have the flexibility to support green building practices, even though the initiatives have no specific green building incentives or requirements.

objectives.<sup>7</sup> We identified at least one initiative at each of the following 11 agencies: the Departments of Agriculture, Defense, Education, Energy (DOE), Health and Human Services, Housing and Urban Development (HUD), Transportation (DOT), and the Treasury (Treasury); the Environmental Protection Agency (EPA); the National Institute of Standards and Technology; and the Small Business Administration. Although we attempted to ensure that we had a complete list of federal green building initiatives, our list is not intended to be comprehensive because, in part, of differences in definitions of a green building across agencies.

We then developed a questionnaire to collect information on the green building initiatives we identified at the 11 agencies. To identify officials who were most knowledgeable about each initiative, and thus the most appropriate person to complete the questionnaire, we used information from our initial meetings with agency officials and information gathered by each agency's audit liaisons. Working with an independent GAO survey expert, we conducted, in person, pretests of draft questionnaires with officials we had identified at three agencies. The pretests took place with officials with expertise in green building at HUD's Office of Public and Indian Housing, officials with tax credit expertise at Treasury's Internal Revenue Service, and commercial and residential building program officials at DOE. We conducted pretests to check that (1) the questions were clear and unambiguous, (2) terminology was used correctly, (3) the questionnaire did not place an undue burden on agency officials, (4) the information could feasibly be obtained, and (5) the questionnaire was comprehensive and unbiased. Using the feedback we received, we made changes to the content and format of the questionnaire. After deciding on the final questionnaire, we sent it to the appropriate agency officials by e-mail in an attached Microsoft Word form. For each initiative, the questionnaire asked officials to (1) confirm general information, (2) report funding for green building, (3) identify goals and performance measures for green building, and (4) provide additional information that would help

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<sup>7</sup>Based on feedback from agency officials, some initiatives that we initially identified were excluded from our review for several reasons, such as not being current (as of fiscal year 2011) or having only proposed green building requirements or incentives that were not yet implemented. Such programs include the Department of Housing and Urban Development's Tax Credit Assistance Program and the Department of Transportation's Capital Investment Grants New and Small Starts Program.



us further understand the initiative. We received a questionnaire response for each initiative and, thus, had a response rate of 100 percent. After analyzing the responses, we conducted follow-up interviews, e-mail exchanges, or telephone discussions with agency officials when responses were unclear or conflicting, such as when both “Yes” and “No” boxes were checked or boxes were left completely unchecked. When necessary, we used the clarifying information provided by agency officials to update answers to questions to improve the accuracy and completeness of the data. During our follow-up conversations, agency officials stated that, for many initiatives, green building funds are not tracked separately from other related activities; therefore, we could not determine governmentwide funding for green building in the nonfederal sector because we could not collect complete or reliable funding data. As a result, we did not report the responses about funding for green building. In addition, the questionnaire asked agency officials to identify entities expected to directly benefit from the initiatives. However, we did not evaluate the effectiveness of the initiatives, including the extent to which the entities identified may or may not have received benefits. The initiatives we identified may vary in the scale of their funding or the number of entities expected to benefit from them, among other things; however, in this report, we do not discuss these differences or compare the scale of the initiatives we identified. A copy of our questionnaire is presented in appendix IV.

Because this effort was not a sample survey, it has no sampling errors. However, the practical difficulties of conducting any survey may introduce errors, commonly referred to as nonsampling errors. For example, difficulties in interpreting a particular question, sources of information available to respondents, or entering data into a database or analyzing them can introduce unwanted variability into the survey results. We took steps in developing the questionnaire and collecting and analyzing the data to minimize such nonsampling errors. For example, social science survey specialists designed the questionnaire in collaboration with GAO staff who had subject matter expertise. We pretested the draft questionnaire to ensure that the questions were relevant, clearly stated, and easy to understand. When we analyzed the data using computer programs, an independent analyst checked the results from all the computer programs. Finally, we verified the accuracy of a small sample of keypunched records by comparing them with their corresponding questionnaires, and we corrected the errors we found. Less than 0.5 percent of the data items we checked had random keypunch errors that would not have been corrected during data processing.

To determine what is known about the results of these initiatives on fostering green building in the nonfederal sector, in addition to analyzing questionnaire data on goals and performance measures, we conducted follow-up interviews with officials representing initiatives for which fostering green building is a primary purpose. We identified this subgroup of initiatives by conducting a content analysis of the initiative descriptions each agency had confirmed or updated in its questionnaire responses. More specifically, based on the research we conducted to develop our full list of initiatives, we had prepopulated each questionnaire with a description of the initiative and then asked respondents to confirm the description or edit it, as appropriate. Using these confirmed or edited descriptions, we categorized initiatives into two groups: those where a primary purpose of the initiative was to foster the use of one or more green building elements by nonfederal entities, and those where it was a secondary or other purpose. Our content analysis results indicated that 64 of the 94 initiatives had green building as a primary purpose. In consideration of resource constraints, to limit the number of follow-up interviews, we listed the initiatives in the primary purpose subgroup by agency to identify the agencies with the most initiatives. On the basis of this analysis, we determined that HUD, DOE, and EPA were the three agencies that had the most initiatives with green building as a primary purpose, accounting for about 67 percent of the initiatives in our subgroup. We then conducted follow-up interviews with officials from the offices chiefly responsible for implementing the three agencies' initiatives, based on the number of initiatives, general mission of the office, or both. During these interviews, we asked officials about their progress and the challenges they face, if any, in implementing the pertinent initiatives, including the extent to which the agency collects performance data and coordinates—internally and with other agencies—on similar initiatives. We also asked the officials to provide related documents, and we reviewed these and other relevant documents from their offices.

Finally, we conducted site visits to green building projects that have received support from some of the initiatives we identified. During these site visits, we interviewed officials connected to the projects—including developers, resident groups, and property managers; local housing authority officials implementing green building projects; and regional federal officials with expertise in fostering green building through some of the initiatives. We identified sites to visit from examples provided in agency responses to our questionnaire, and we selected locations that had several projects that could be visited, covered a range of agencies and building types, and were convenient to GAO offices. During these visits, we toured projects at varying stages of completion. Specifically, we

toured projects funded by the HUD Green Retrofit Program at Castle Square Apartments in Boston and Eden Issei Terrace Apartments in Hayward, California. In addition, we toured a project being conducted by the Cambridge Housing Authority in Massachusetts that participates in the HUD Moving to Work program. We toured projects funded by the DOT Transit Investments for Greenhouse Gas and Energy Reduction program at Alameda-Contra Costa Transit District facilities in Oakland, California. We also toured two Energy Star hotels in Boston and San Francisco. We interviewed officials responsible for overseeing the projects and asked them to discuss, among other things, the progress and challenges they faced, if any, in implementing the projects. The findings from our site visit interviews cannot be generalized to sites or projects not included in this nonprobability sample.

We conducted this performance audit from September 2010 to November 2011 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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# Appendix II: Federal Initiatives Identified That Foster Green Building in the Nonfederal Sector

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We identified 11 federal agencies with 94 initiatives that foster green building in the nonfederal sector, which includes private, state, local, and tribal entities. The following tables provide summaries, based on the questionnaire responses, of each of these initiatives by agency, and whether—according to our analysis—they foster green building directly or indirectly. A primary purpose of direct initiatives is to foster green building (or any element thereof); thus, they foster one or more green building elements directly. Indirect initiatives are part of broader efforts not focused primarily on green building (or any element thereof); thus, they foster green building elements indirectly.

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**Table 5: U.S. Department of Agriculture (USDA) Initiatives Identified That Foster Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

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**Direct initiatives**

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**High Energy Cost Grant Program:** This program provides financial assistance for a broad range of energy facilities, equipment, and related activities to offset the impacts of extremely high residential energy costs on eligible communities. Grant funds may be used for on-grid and off-grid renewable energy systems and for the implementation of cost-effective demand-side management and energy conservation programs that benefit eligible communities.

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**Rural Energy for America:** This program promotes energy efficiency and renewable energy for agricultural producers and rural small businesses through the use of grants and loan guarantees for energy-efficiency improvements and renewable-energy systems, and grants for energy audits and renewable-energy development assistance.

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**Rural Housing Service Section 502 Direct and Guaranteed Loan Assistance and Section 504 Loan and Grant Assistance for the Rural Economic Development Energy Efficiency Initiative:** This initiative is a USDA-Department of Energy partnership as part of a governmentwide “Recovery Through Retrofit” initiative. Section 502 and Section 504 funding will be used through the Rural Economic Development Energy Efficiency program to improve the energy efficiency of single and multifamily housing and businesses.

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**Rural Housing Service Section 514 and Section 516 Assistance for Farm Labor Housing:** These programs provide direct loans and grants for new construction of housing for farm laborers. Under Notices of Funding Availability for the programs, USDA promotes the use of energy saving design, materials, construction, and operation for newly constructed or substantially rehabilitated residential housing and for the rehabilitation of existing portfolio properties.

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**Rural Housing Service Section 515 Assistance for Low-income, Elderly, and Handicapped Housing:** This program provides direct loans for the construction of rural rental housing for low-income eligible tenants. Under Notices of Funding Availability for the program, USDA promotes the use of energy saving design, materials, construction, and operation for newly constructed or substantially rehabilitated residential housing and for the rehabilitation of existing portfolio properties.

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**Rural Utilities Service Electric Loan Programs:** USDA’s Rural Utilities Service is authorized to provide direct loans to provide and improve electric generation, transmission, and distribution service in rural areas and to assist electric borrowers in implementing demand-side management, efficiency and conservation programs, and on-grid and off-grid renewable-energy systems. In addition, USDA may provide loan guarantees to not-for-profit lenders that may be used to make loans for a full range of eligible electric and telephone purposes, which may include borrower energy efficiency and conservation programs.

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**Section 538 Guaranteed Rural Rental Housing Program:** This program helps increase the supply of affordable rental housing in rural areas and ensures that housing is affordable to certain rural residents, among other things. Under the program, all new multifamily housing projects financed in whole or in part by USDA will be encouraged to use green building practices, emphasizing energy efficiency and conservation.

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**Appendix II: Federal Initiatives Identified That Foster Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

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**Indirect initiative**

**Rural Housing Service Section 502 Direct and Guaranteed Loan Assistance for the Rural Energy Plus Program:** This program provides loans primarily to help low-income individuals or households purchase homes in rural areas. Under the program, eligible applicants may be able to increase qualifying ratios used to determine an applicant's ability to repay a home loan by up to 2 percentage points if they are purchasing a newer home that is energy efficient.

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Source: GAO analysis of questionnaire responses and USDA information.

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**Table 6: Department of Commerce's National Institute of Standards and Technology (NIST) Initiatives Identified That Foster Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

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**Direct initiatives**

**Advanced Building Energy Technologies Program:** This program develops the measurement science needed to deploy renewable and emerging energy-efficient technologies to help achieve net-zero energy use in residential and commercial buildings.

**Embedded Intelligence in Buildings Program:** This program develops the measurement science needed to promote the use of embedded intelligence systems in buildings that enable more energy-efficient building operations, new integrated functionality for building systems, and improved occupant comfort and safety.

**Improved Building Energy Performance Program:** This program develops the measurement science needed to evaluate how buildings perform, covering carbon dioxide emissions, indoor air quality, and other metrics, in order to better evaluate overall building performance compared to other approaches that rely on modeling or other inexact assessment methods.

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Source: GAO analysis of questionnaire responses and NIST information.

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**Table 7: Department of Defense (DOD) Initiative Identified That Fosters Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

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**Indirect initiative**

**Environmental Security Technology Certification Program:** This program identifies and demonstrates cost-effective technologies that address the agency's highest priority environmental requirements, including green building, although the effort is broadly focused on issues related to managing the agency's energy needs.

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Source: GAO analysis of questionnaire responses and DOD information.

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**Table 8: Department of Education (ED) Initiatives Identified That Foster Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

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**Indirect initiatives**

**Impact Aid Construction Program:** Through this program, ED allows local school districts to use competitive grant funds to support emergency repairs and modernization efforts of school and college facilities, including green building efforts. This program's green building authority applied only to the one-time funding provided by the American Recovery and Reinvestment Act of 2009.

**State Fiscal Stabilization Fund:** This fund provides funding to states, local educational agencies, and public institutions of higher education for, among other things, modernization, renovation, and repair of public school and college facilities. States and local educational agencies may use program funds for construction, but public institutions of higher education may not.

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Source: GAO analysis of questionnaire responses and ED information.

Table 9: Department of Energy (DOE) Initiatives Identified That Foster Green Building in the Nonfederal Sector

Type of initiative/name and description of initiative
<b>Direct initiatives</b>
<b>Building Technologies Program/Commercial Building Integration/Commercial Building Initiative:</b> This initiative aims to improve the energy efficiency of new and existing commercial buildings by researching technologies, strategies, and tools to improve energy savings over current building codes; help guide DOE research; encourage industry to move toward energy-efficient design and strategies; and provide technical assistance for specific commercial-sector projects that will demonstrate possibilities in energy reduction.
<b>Building Technologies Program/Emerging Technologies:</b> The Emerging Technologies subprogram conducts research and development and technology transfer activities associated with energy-efficient products and technologies for both residential and commercial buildings. These efforts address opportunities within building components, such as lighting, building envelope technologies (including advanced windows), space conditioning (including low Global Warming Potential refrigerant research), water heating, appliances, solar heating and cooling, and analysis tools.
<b>Building Technologies Program/Home Energy Score Pilot Program:</b> Under the Home Energy Score Pilot subprogram, trained and certified contractors use a standardized assessment tool developed by DOE and Lawrence Berkeley National Laboratory to evaluate a home's energy assets, such as its heating and cooling systems and insulation levels. It was launched in November 2010 and is currently being tested with local government, utility, and nonprofit partners in nine pilot communities across the country, located in both urban and rural areas that cover a wide range of climates.
<b>Building Technologies Program/Residential Buildings Integration:</b> The Residential Buildings Integration subprogram focuses on improving the efficiency of new and existing homes through research, development, deployment, and technology transfer activities.
<b>Building Technologies Program/Residential Buildings Integration/Solar Decathlon:</b> The Solar Decathlon subprogram focuses on educating students and the public about the money-saving opportunities and environmental benefits presented by clean energy products and design solutions. It is intended to demonstrate the comfort and affordability of homes that combine energy-efficient construction and appliances with renewable-energy systems currently available.
<b>Building Technologies Program/Technology Validation and Market Introduction/Building Energy Codes:</b> The Building Energy Codes subprogram assists in the development, adoption, and enforcement of energy codes in the states. It develops and maintains free software and tools to support those codes and standards, as well as conducts outreach and deployment activities related to energy codes and high-performance sustainably designed buildings.
<b>Energy Efficient Building Systems Regional Innovation Cluster Initiative:</b> This initiative is a multiagency pilot intended to spur regional economic growth while developing innovative energy-efficient building technologies, designs, and systems.
<b>Energy Transformation Acceleration Fund/Advanced Research Projects Agency/Building Energy Efficiency Through Innovative Thermodevices:</b> This subprogram seeks to develop energy-efficient building cooling technologies that will reduce energy consumption and greenhouse gas emissions from overall cooling and refrigerants used in vapor compression systems.
<b>State Energy Efficient Appliance Rebate Program:</b> This program makes funds available to states and territories to promote the purchase of Energy Star-qualified appliances. Under this program, consumers can receive rebates to purchase new energy-efficient appliances when they replace used appliances.
<b>Superior Energy Performance Program:</b> This program is a certification program that is intended to provide managers of industrial and commercial buildings with a road map for achieving continual improvement in energy efficiency while maintaining competitiveness. The program is intended to provide a transparent, globally accepted system for verifying energy performance improvements and management practices.
<b>Weatherization and Intergovernmental Activities/Energy Efficiency and Conservation Block Grant:</b> This subprogram is intended to help U.S. cities, counties, states, territories, and Indian tribes develop, promote, implement, and manage energy-efficiency and conservation projects and programs designed to improve energy efficiency in buildings, transportation, and other sectors. Grants can be used for energy-efficiency and conservation programs and projects communitywide, as well as renewable-energy installations on government buildings.

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**Appendix II: Federal Initiatives Identified That Foster Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

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**Weatherization and Intergovernmental Activities/State Energy Program:** The goal of this subprogram is to provide financial and technical assistance to states through formula and competitive grants. States use their formula grants to develop strategies and goals to address their energy priorities, including developing energy projects focused on buildings.

**Weatherization and Intergovernmental Activities/Tribal Energy Program:** This program is intended to provide financial and technical assistance to Indian tribes to help them evaluate and develop their renewable-energy resources and reduce their energy consumption through efficiency and weatherization. The program also provides education and training opportunities to build knowledge and skills essential to developing, implementing, and sustaining energy-efficiency and renewable-energy projects.

**Weatherization and Intergovernmental Activities/Weatherization Assistance Program:** The goal of this program is to enable low-income families to permanently reduce their energy bills by making their homes more energy efficient. DOE provides funding to states, U.S. territories, and Indian tribal governments, each which manages the program's day-to-day details. These governments, in turn, fund a network of local community action agencies, nonprofit organizations, and local governments that provide these weatherization services.

**Weatherization Innovation Pilot Program:** This program aims to accelerate innovations in whole-house weatherization for low-income families. Projects include using new and nontraditional partners and weatherization service providers leveraging nonfederal financial resources in addition to federal funds and aiming to improve the effectiveness of low-income weatherization through the use of new materials, technologies, behavior-change models, and processes.

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**Indirect initiatives**

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**Small Business Innovation Research and Small Business Technology Transfer programs:** These programs allow federal agencies with large research and development budgets to set aside a small fraction of their funding for competitions among small businesses. Small businesses that win awards in these programs keep the rights to any technology developed and are encouraged to commercialize the technology. These competitions include multiple research areas, including energy use in buildings.

**Title 17 Loan Guarantee Program:** This program, authorized under the Energy Policy Act of 2005, guarantees loans for projects that (1) use new or significantly improved technologies, as compared with commercial technologies already in service in the United States, and (2) avoid, reduce, or sequester emissions of air pollutants or man-made greenhouse gases.

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Source: GAO analysis of questionnaire responses and DOE information.

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**Table 10: Department of Health and Human Services (HHS) Initiative Identified That Fosters Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

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**Indirect initiative**

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**Low Income Home Energy Assistance Program:** This program is a block grant to assist low-income households, particularly those with the lowest incomes, in meeting their immediate home energy needs. Under this program, grantees, including states, territories, and Indian tribes and tribal organizations, may use a portion of the funds for weatherization and other energy-related home repair.

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Source: GAO analysis of questionnaire responses and HHS information.

Table 11: Department of Housing and Urban Development (HUD) Initiatives Identified That Foster Green Building in the Nonfederal Sector

Type of initiative/name and description of initiative
<b>Direct initiatives</b>
<b>Capital Fund Recovery Act Competitive Grant Program:</b> This program was included in the Recovery Act. One component was the “Creation of Energy Efficient Green Communities” grant competition, which provided competitive grants to public housing agencies for either new construction or energy retrofit projects that increase the energy efficiency and environmental performance of public housing properties.
<b>Green Retrofit Program for Multifamily Housing:</b> The American Recovery and Reinvestment Act of 2009 included authority for HUD to make loans or award grants for utility-saving retrofits and other retrofits that produce environmental benefits in existing HUD-assisted multifamily housing, subject to agreement between HUD and the owner. HUD offered Green Retrofit Grants and Green Retrofit Loans of up to \$15,000 per unit that can be used to finance projects that, among other things, lower electricity use, lower the use of raw materials, and increase the amount of recycled content.
<b>Healthy Homes Program:</b> This program awards grants to mostly local government agencies to create healthier and greener homes through a number of subprograms: (1) the Coordinated Housing Hazard Intervention Grant Program, (2) Healthy Homes Production Grants, (3) Asthma Interventions in Multifamily Housing Grant Program, (4) Healthy Homes Technical Studies Grant Program, and (5) contracts and interagency agreements.
<b>Mark to Market Green Initiative:</b> This initiative is a nationwide pilot program to encourage owners and purchasers of affordable, multifamily properties to rehabilitate and operate their properties using sustainable building principles. When property owners and purchasers refinance their properties under HUD’s Mark to Market financial restructuring program and incorporate environmentally sustainable or energy-efficient improvements, HUD will reduce their required contribution toward the improvements, allowing those costs to be financed rather than paid out of pocket by the owner up front. The initiative uses a property assessment and energy audit to determine the best energy and green retrofit needs and opportunities for specific properties.
<b>Multifamily Energy Innovation Fund:</b> This fund is directed at the multifamily rental market and is designed to help catalyze a home energy retrofit market in the United States by providing competitive grants to accelerate private investment in cost-saving energy-efficiency retrofits in the multifamily residential sector.
<b>PowerSaver Pilot Program:</b> This program offers homeowners low-cost loans to make energy-saving improvements to their homes. Backed by the Federal Housing Administration, these loans provide single-family homeowners with up to \$25,000 to make energy-efficient improvements, such as the installation of insulation, duct sealing, doors and windows, HVAC systems, water heaters, as well as solar panels or geothermal systems. The PowerSaver initiative is based on the Federal Housing Administration’s Title I program and is specifically designed and promoted as a green initiative.
<b>Public Housing Environmental and Conservation Clearinghouse:</b> Through this initiative, HUD’s Office of Public and Indian Housing, among other things, provides energy consumption and water consumption benchmarking tools for residential public housing buildings. The tools are based on energy and water consumption data voluntarily submitted for over 9,100 buildings by almost 350 public housing authorities.
<b>Public Housing Operating Fund, Energy Performance Contract Incentives:</b> This initiative provides incentives for public housing authorities to secure third-party financing for energy projects implemented with an Energy Services Company through an energy performance contract. Incentives include an “add-on” subsidy, or a “frozen rolling base” incentive. HUD project approval is based on a determination that payments under the contract can be funded from reasonably anticipated energy savings.
<b>Public Housing Operating Fund, Streamlining Energy Performance Contracting:</b> This initiative is designed to help small public housing authorities increase their use of energy performance contracting—the use of third-party financing for energy projects. Small public housing authorities have been traditionally underserved by the energy industry and HUD’s utility incentives, and by helping public housing authorities adopt the best energy-improvement practices through a simplified submission and approval process, HUD hopes to reduce their utility consumption and carbon emissions.
<b>Section 203(b) Mortgage Insurance, Energy Efficient Mortgage:</b> The Energy Efficient Mortgage is designed to help homebuyers or homeowners finance the cost of adding energy-efficiency features to new or existing housing as part of a Federal Housing Administration-insured home purchase or refinancing mortgage.



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**Appendix II: Federal Initiatives Identified That  
Foster Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

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**Section 203(b) Mortgage Insurance, Weatherization:** This initiative allows borrowers to include up to \$3,500 in a Federal Housing Administration mortgage to pay for basic weatherization items such as thermostats, insulation, storm windows, or similar building envelope improvements.

**Sustainable Communities Initiative, Housing-Transportation Integration Research:** This initiative is a research and development effort designed to support location efficient transportation planning and housing development for local communities wishing to learn more about the combined cost of housing and transportation. The initiative is administered by HUD, in partnership with DOT and EPA.

**Sustainable Communities Initiative, Sustainable Community Challenge Grants:** This initiative is designed to create incentives for state, metropolitan, and local organizations to change zoning and land-use ordinances in ways that encourage sustainable growth. The grants leverage local and federal funds for a variety of eligible activities, including revisions to building codes that promote energy-efficient rehabilitations of older buildings to create affordable and healthy housing.

**Transformation Initiative, Energy Efficiency and Green Building Across Affordable Housing Program:** This is a coordinated technical assistance and capacity building program for HUD partners and grantees to incorporate energy-efficient and green activities in their properties or programs through energy training and technical assistance to state and local housing agencies and other affordable housing organizations.

**Transformation Initiative, Green and Healthy Homes:** This initiative is designed to reduce the number of homes with health and safety hazards in low- and moderate-income homes through targeted physical interventions. Projects incorporate green building elements such as integrated design, energy conservation and efficiency, water conservation and efficiency, and indoor air quality. HUD provides a limited amount of technical assistance to some localities where projects are active and makes relevant grant programs available to initiative participants.

**Transformation Initiative, Sustainable Building Practice:** This initiative facilitates sustainable construction in Indian country by providing technical assistance to tribes, documenting activities, and disseminating results. The initiative builds on efforts already performed by HUD's Office of Native American Programs to help tribes improve their housing, but it focuses on sustainable construction and incorporates enhanced communication and information dissemination plans.

**Transformation Initiative, Sustainable Communities Grant Program:** This is a research grant program operated by HUD's Office of Policy Development and Research that funds proposals, many of which relate to green building principles. It is designed to fill data and information gaps regarding sustainability; increase understanding of incentives, strategies, and approaches that encourage integrated planning and promote sustainable green and energy-efficient practices; and encourage strategic thinking about a broad, sustainable agenda for urban areas beyond current program priorities.

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**Indirect initiatives**

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**Choice Neighborhoods:** This initiative seeks to transform distressed neighborhoods and public and assisted housing projects into sustainable mixed-income neighborhoods by linking housing improvements with appropriate schools, public assets, transportation, and access to jobs. Planning grants enable communities to develop a comprehensive transformation plan. Implementation grants include, but are not limited to, construction, acquisition or rehabilitation of public, assisted and privately owned housing that incorporate sustainable design principles, including energy efficiency.

**HOME Investment Partnerships Program:** HUD uses this initiative to allocate funds by formula to eligible state and local governments to expand the supply of decent, safe, sanitary, and affordable housing for very low-income and low-income families, with primary attention to rental housing. State and local governments use HOME funds to carry out multiyear housing strategies through acquisition, rehabilitation, and new construction of housing, as well as tenant-based rental assistance. Local housing organizations can encourage or require green building elements, including energy efficiency, and must report the number of units that meet the Energy Star standard. HUD has developed an Energy Star training module and encourages grantees to incorporate energy efficiency in their projects.

**HOPE VI Revitalization Grant Program:** This program awards funds to public housing authorities with severely distressed public housing. Grant applicants are awarded points for meeting various criteria for physical revitalization projects, including green development and energy-efficiency strategies.

**Indian Community Development Block Grant Program:** This program, created by the Recovery Act, provides funds to low- and moderate-income individuals residing in Indian and Alaska native communities for improvements to housing, living environments, and economic opportunities. Funds may be used for energy-efficient housing rehabilitation and new construction under limited circumstances.

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**Appendix II: Federal Initiatives Identified That  
Foster Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

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**Indian Housing Block Grant Program:** HUD received a \$510 million appropriation under the Recovery Act for this program, also known as the Native American Housing Block Grant Program. These funds were allocated for new residential construction, acquisition, and rehabilitation projects, some of which include energy-efficiency and conservation measures.

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**Moving to Work Demonstration Program:** This program allows public housing authorities to design and test innovative, locally designed housing and self-sufficiency strategies for low-income families by permitting public housing authorities to combine certain housing funds into a single source and exempting them from existing public housing and Housing Choice Voucher program rules. In addition to other activities, it also allows public housing authorities to retain monetary savings from projects to reduce energy consumption.

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**Section 203(k) Mortgage Insurance, Section 203(k) Streamlined Mortgage Insurance:** This initiative enables homebuyers and homeowners to finance both the purchase (or refinancing) of a house and the cost of its rehabilitation through a single mortgage, or to finance the rehabilitation of their existing home. HUD's Federal Housing Administration insures these mortgages against default. Eligible upgrades include making energy-conservation improvements.

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**Supportive Housing for Persons with Disabilities (Section 811):** In fiscal year 2010, HUD began requiring applicants seeking Section 811 funding to increase energy and water conservation and offered incentives to applicants who incorporate green building features into their projects. Specific requirements and incentives depend on the type of development proposed by applicants. For new construction and substantial rehabilitation projects, sponsors and owners are required to incorporate energy efficiency and water conservation strategies; for acquisition and moderate or modest rehabilitation projects, pre- and post-construction energy audits and incorporation of conservation techniques are required; and for all applicants, incentives in the form of additional scoring points are available to applications that meet certain criteria concerning green development, sustainable design, solar orientation principles, and operations and maintenance manuals.

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**Supportive Housing for the Elderly (Section 202):** This program is intended to help expand the supply of affordable housing with services for the low-income elderly by providing them with options for independent living in a supportive environment. In fiscal year 2010, HUD began requiring applicants seeking Section 202 funding to increase energy and water conservation and offered incentives to applicants who incorporate green building features into their projects. Specific requirements and incentives depend on the type of development proposed by applicants. For new construction and substantial rehabilitation projects, sponsors and owners are required to incorporate energy efficiency and water conservation strategies; for acquisition and moderate or modest rehabilitation projects, pre- and post-construction energy audits and incorporation of conservation techniques are required; and for all applicants, incentives in the form of additional scoring points are available to applications that meet certain criteria concerning green development, sustainable design, solar orientation principles, and operations and maintenance manuals.

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**Sustainable Communities Initiative, Capacity-building Program and Tools Clearinghouse:** This grant program provides tools, skills, and best practices to educate and assist local or tribal governments, metropolitan areas and regional partnerships in adopting integrated plans, strategies, and management tools designed to help them become more sustainable. The program uses funds from HUD's Sustainable Communities Initiative and EPA's Offices of Sustainable Communities, Brownfields and Land Revitalization, and Water.

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**Sustainable Communities Initiative, Sustainable Communities Regional Planning Grants:** This initiative is designed to improve regional planning efforts that integrate housing and transportation decisions, including the challenges of energy use and climate change. Eligible activities include developing a comprehensive regional plan for sustainable development that will guide local, regional, and state governments as they consider a variety of issues, including energy reduction strategies.

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**Title I Property Improvement Loan Insurance Program (Title I Program):** This is a home improvement loan initiative that can be used to improve a home's energy efficiency. Through the program, the Federal Housing Administration insures secured and unsecured loans made by private lenders, offering consumers the opportunity to obtain more affordable home improvement loans. While the loans are primarily used to make needed repairs or improvements to residential properties, they can also be used for weatherization or other energy-conservation improvements. Title I loans are usually second loans, and the maximum loan amount is \$25,000. The Federal Housing Administration insures private lenders against the risk of default for up to 90 percent of any single loan.

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Source: GAO analysis of questionnaire responses and HUD information.

**Appendix II: Federal Initiatives Identified That Foster Green Building in the Nonfederal Sector**

**Table 12: Department of Transportation (DOT) Initiatives Identified That Foster Green Building in the Nonfederal Sector**

Type of initiative/name and description of initiative
<b>Direct initiatives</b>
<b>Federal Transit Administration Environmental Management Systems Training and Technical Assistance:</b> This program is designed to help transit agencies develop and implement environmental management systems, using the 14001 Standard of the International Organization for Standardization. An environmental management system sets procedures that ensure an organization's daily operations comply with environmental regulations and support environmental stewardship objectives to minimize impact to the environment and increase efficiency.
<b>Federal Transit Administration Transit Investments for Greenhouse Gas and Energy Reduction:</b> This program offers capital assistance to public transit agencies to implement new strategies for reducing greenhouse gas emissions or reduce energy usage from their operations, including for transit facilities.
<b>Indirect initiatives</b>
<b>Federal Transit Administration Bus and Bus Facilities Program:</b> This program provides capital assistance for new and replacement buses, related equipment, and facilities. If funds are not earmarked, then project selections for funding may be determined when green building certification is specified as funding criteria in a notice of funding availability.
<b>Federal Transit Administration Urbanized Area Formula Program:</b> This program makes federal resources available to urbanized areas and to governors, or their designee, for transit capital and operating assistance in urbanized areas and for transportation-related planning. Eligible projects that may be funded include capital investments in bus and bus-related activities such as construction of maintenance and passenger facilities.
<b>Formula Grants for Other than Urbanized Areas:</b> This formula-based program provides funding to states to support public transportation in rural areas with a population of less than 50,000. Eligible projects that may be funded include capital investments and operating costs associated with public transportation facilities that meet green building standards.

Source: GAO analysis of questionnaire responses and DOT information.

**Table 13: Department of the Treasury Initiatives Identified That Foster Green Building in the Nonfederal Sector**

Type of initiative/name and description of initiative
<b>Direct initiatives</b>
<b>Accelerated Depreciation Deduction for Specified Energy Property:</b> Under the Modified Accelerated Cost Recovery System, businesses may deduct depreciation on certain energy property eligible for the Energy Production Tax Credit or the Energy Investment Tax Credit under a shorter 5-year recovery period than otherwise is permitted under the general depreciation system. This property includes equipment that uses solar energy to heat or cool (or to provide hot water for use in) a building.
<b>Energy Efficient Commercial Buildings Deduction:</b> This program allows businesses to take a tax deduction on the cost of energy-efficient property for new or renovated buildings by reducing the energy costs associated with three components—lighting systems; building envelope; and heating, cooling, ventilation, and hot water systems.
<b>Energy Investment Tax Credit:</b> This program provides tax credits to businesses for certain qualified renewable energy and energy-efficiency technologies. For example, this program offers a 10 percent investment tax credit for small (50 megawatts or less) combined heat and power systems that have an energy efficiency of greater than 60 percent (or a lesser efficiency with a reduced credit for biomass facilities), produce at least 20 percent of their useful energy as useful thermal energy, and produce at least 20 percent of their useful energy as either electrical or mechanical energy (or as a combination of the electrical and mechanical energy). This program also offers investment tax credits for fuel cell and microturbine property.
<b>New Energy Efficient Home Credit:</b> This program offers tax credits of either \$1,000 or \$2,000 for each new home that meets energy-efficiency requirements in the law.

**Appendix II: Federal Initiatives Identified That Foster Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

**Nonbusiness Energy Property Tax Credit:** This program provides a personal tax credit for nonbusiness energy property. Generally, there are two categories of nonbusiness energy property: eligible building envelope components, such as qualifying insulation and exterior windows; and residential energy property, such as qualifying air conditioners and electric heat pumps.

**Payments for Specified Energy Property in Lieu of Tax Credits:** Section 1603 of the American Recovery and Reinvestment Act of 2009 established this renewable energy grant program for certain qualified renewable-energy technologies. Cash payments under this program may be taken in lieu of the Energy Investment Tax Credit or the Energy Production Tax Credit.

**Residential Energy Conservation Subsidy Exclusion:** This program makes nontaxable certain energy conservation subsidies provided to customers by public utilities, either directly or indirectly. Eligible dwellings include houses, apartments, condominiums, and mobile homes; and energy-conservation measures may include installations or modifications made that are designed to reduce consumption of electricity or natural gas or improve the management of energy demand.

**Residential Energy Efficient Property Credit:** This program provides a tax credit for homeowners of up to 30 percent of the costs for eligible solar electric property, solar water heating property, small wind energy property, fuel cell property, and geothermal heat pump property.

Source: GAO analysis of questionnaire responses and Department of the Treasury information.

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**Table 14: Environmental Protection Agency (EPA) Initiatives Identified That Foster Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

**Direct initiatives**

**Energy Star Program:** The Energy Star Program offers labels for products that are more energy efficient than required by current standards, works with homebuilders, home energy raters, and other stakeholders and organizations to promote energy-efficient homes and also promotes guidance, tools, and other resources to help businesses and organizations reduce their energy use.

**Green Communities Program:** This program is intended to provide a web-based toolkit and planning guide designed to help communities access the tools and information needed to help them become more sustainable and livable communities.

**Green Infrastructure Program:** This program is intended to promote a new approach to storm-water management that is cost-effective, sustainable, and environmentally friendly. Practices promoted through the program include rain gardens, porous pavement, green roofs, and rainwater harvesting.

**Green Power Partnership:** This voluntary program is intended to build organizational demand for newer sources of green power generation by offering expert advice, technical support, tools, and resources. Green power is electricity produced from a subset of renewable resources, such as solar, wind, geothermal, and biomass.

**Healthy Communities—Clean, Green, and Healthy Schools:** This initiative is designed to support states and communities in promoting healthier school environments and to broaden the implementation of EPA’s existing school environmental health programs, including those for asthma, indoor air quality, and integrated pest management.

**Indoor Environments Program:** This program promotes the use of integrated, whole-building approaches to protect occupant health while saving energy, resources, and money. These resources include Indoor Air Quality Tools for Schools, a program whose goal is to help schools establish and maintain a healthy environment in school buildings by providing guidance, training, checklists, and other resources to identify, correct, and prevent indoor air quality problems; and the Radon Program, which is intended to promote radon-resistant construction techniques for new homes and to educate the public on radon testing and mitigation technologies in existing homes.

**Industrial Materials Recycling Program:** This program provides information on how industrial materials, such as coal combustion products, foundry sand, and construction and demolition debris, can be recycled to meet the material needs of the nation’s construction industry.

**Pesticide Environmental Stewardship Program:** This voluntary membership program works with the nation’s pesticide-user community to reduce the human health and environmental risks associated with both pest and pesticide use, promoting the use of Integrated Pest Management, including in schools.

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**Appendix II: Federal Initiatives Identified That Foster Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

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**Smart Growth Program:** This program is a key component of EPA's Office of Sustainable Communities, which serves as the lead office for EPA's involvement in the Partnership for Sustainable Communities with HUD and DOT. The office is intended to help communities improve the environmental and health outcomes from development by conducting research and developing tools, providing information and outreach to communities, delivering technical assistance, and engaging other federal partners.

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**Tribal Green Building Initiative:** Through this initiative, EPA works with tribes and other federal agencies to advance tribes' efforts to adopt building codes related to green building and to address barriers associated with developing and implementing these codes. The initiative supports tribal building codes that reduce energy and water use, improve indoor air quality, use nontoxic building materials, and conserve other resources.

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**WaterSense:** Through this program, EPA partners with local water utilities and governments, product manufacturers, retailers, and consumers to promote water-efficient products and practices that can benefit a wide variety of recipients, including individual property owners, state and local governments, public housing agencies, and businesses.

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**Indirect initiatives**

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**Brownfields Program:** This program is intended to provide financial and technical assistance by encouraging states, communities, and other stakeholders to prevent, assess, safely clean up, and reuse brownfields, which are properties where reuse may be complicated by the potential presence of a hazardous substance, pollutant, or contaminant.

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**Design for the Environment Program:** Through this program, EPA works in partnership with industry, environmental groups, local and state governments, the federal government, and academia to reduce risk to people and the environment by finding ways to prevent pollution.

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**Environmentally Preferable Purchasing Program:** This program is intended to help the federal government "buy green" and, in doing so, uses the federal government's buying power to stimulate market demand for green products and services.

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**Environmentally Responsible Redevelopment and Reuse:** The goal of this program is to use enforcement and other agencywide incentives to promote sustainable cleanup and redevelopment of contaminated sites.

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**Heat Island Reduction Program:** This program focuses on translating urban heat island research into outreach materials, tools, and guidance to provide communities with information needed to develop urban heat island projects, programs, and policies.

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**Small Business Innovation Research Program:** This program is a multiagency effort to support research, development, and commercialization of technologies by small businesses. EPA focuses on the development of green building technologies through the program.

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**WasteWise:** This voluntary program is intended to help organizations eliminate municipal solid waste and select industrial wastes. The program is part of EPA's overall efforts to promote resource conservation and sustainable materials management through waste prevention and recycling. WasteWise's green building-related activities have focused on providing tools, information and resources to businesses, local governments, state governments, and nonprofit organizations to increase municipal solid waste recycling as part of greening the operations of buildings.

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Source: GAO analysis of questionnaire responses and EPA information.

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**Table 15: Small Business Administration (SBA) Initiatives Identified That Foster Green Building in the Nonfederal Sector**

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**Type of initiative/name and description of initiative**

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**Direct initiative**

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**Small Business Energy Audit and Energy Efficiency Program:** This program provides energy-efficiency assistance to small businesses through small business development centers. Assistance may include, among other things, access to information and resources on energy-efficiency practices and financing options, training and educational activities, and free energy audits.

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**Indirect initiative**

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**Certified Development Company 504 Loan Program:** This program provides small business with long-term, fixed-rate financing for the purchase of land, buildings, and long-life capital equipment. The program is for the purposes of, among other things, helping businesses reduce energy consumption by at least 10 percent; increase the use of sustainable or low-impact design; and promote the use of renewable fuel sources.

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Source: GAO analysis of questionnaire responses and SBA information.

# Appendix III: Selected Questionnaire Responses for Federal Initiatives That Foster Green Building in the Nonfederal Sector

We identified 11 federal agencies with 94 initiatives that foster green building in the nonfederal sector, which includes private, state, local, and tribal entities. We developed a questionnaire about the initiatives and submitted it to the agencies. The following tables provide selected questionnaire responses for each of the initiatives, by agency. We are reporting responses that elaborate on our report findings and for which agencies provided the most complete information.

**Table 16: Department of Agriculture (USDA) Selected Questionnaire Responses for Initiatives That Foster Green Building in the Nonfederal Sector**

Key																							
1. Integrated design	7. Contracts	17. Businesses																					
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																					
3. Water conservation or efficiency	9. Grants	19. Local governments																					
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																					
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																					
6. Sustainable siting or location	12. Research and development	22. State governments																					
	13. Tax credits	23. Other																					
	14. Tax deductions																						
	15. Technical assistance																						
	16. Other																						
Initiative	Green building elements fostered						Types of assistance provided										Recipients expected to directly benefit						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
High Energy Cost Grant Program		✓							✓								✓	✓	✓	✓	✓	✓	
Rural Energy for America	✓	✓			✓	✓			✓						✓	✓	✓		✓			✓	✓
Rural Housing Service Section 502 Direct and Guaranteed Loan Assistance and Section 504 Loan and Grant Assistance for the Rural Economic Development Energy Efficiency initiative	✓	✓	✓	✓			✓	✓	✓	✓				✓			✓	✓					
Rural Housing Service Section 502 Direct and Guaranteed Loan Assistance for the Rural Energy Plus Program	✓	✓	✓	✓			✓	✓	✓	✓				✓					✓				
Rural Housing Service Section 514 and Section 516 Assistance for Farm Labor Housing	✓	✓	✓	✓	✓	✓		✓	✓								✓	✓	✓	✓	✓	✓	✓
Rural Housing Service Section 515 Assistance for Low-income, Elderly, and Handicapped Housing	✓	✓	✓	✓	✓	✓		✓									✓	✓	✓	✓	✓	✓	✓
Rural Utilities Service Electric Loan Programs		✓						✓									✓		✓	✓		✓	✓
Section 538 Guaranteed Rural Rental Housing Program	✓	✓	✓	✓	✓	✓									✓		✓	✓	✓	✓	✓	✓	✓
<b>Total</b>	<b>6</b>	<b>8</b>	<b>5</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>5</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>6</b>	<b>5</b>

Source: GAO analysis of questionnaire responses.

**Appendix III: Selected Questionnaire Responses for Federal Initiatives That Foster Green Building in the Nonfederal Sector**

**Table 17: Department of Commerce’s National Institute of Standards and Technology (NIST) Selected Questionnaire Responses for Initiatives That Foster Green Building in the Nonfederal Sector**

<b>Key</b>																						
1. Integrated design	7. Contracts	17. Businesses																				
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																				
3. Water conservation or efficiency	9. Grants	19. Local governments																				
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																				
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																				
6. Sustainable siting or location	12. Research and development	22. State governments																				
	13. Tax credits	23. Other																				
	14. Tax deductions																					
	15. Technical assistance																					
	16. Other																					

  

Initiative	Green building elements fostered						Types of assistance provided										Recipients expected to directly benefit						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Advanced Building Energy Technologies Program	✓	✓		✓	✓				✓			✓			✓								✓
Embedded Intelligence in Buildings Program	✓	✓		✓	✓				✓			✓			✓								✓
Improved Building Energy Performance Program	✓	✓		✓	✓				✓			✓			✓								✓
<b>Total</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>

Source: GAO analysis of questionnaire responses.

**Table 18: Department of Defense (DOD) Selected Questionnaire Responses for Initiative That Fosters Green Building in the Nonfederal Sector**

<b>Key</b>																						
1. Integrated design	7. Contracts	17. Businesses																				
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																				
3. Water conservation or efficiency	9. Grants	19. Local governments																				
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																				
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																				
6. Sustainable siting or location	12. Research and development	22. State governments																				
	13. Tax credits	23. Other																				
	14. Tax deductions																					
	15. Technical assistance																					
	16. Other																					

  

Initiative	Green building elements fostered						Types of assistance provided										Recipients expected to directly benefit						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Environmental Security Technology Certification Program	✓	✓	✓	✓								✓					✓			✓			✓
<b>Total</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>

Source: GAO analysis of questionnaire responses.

**Appendix III: Selected Questionnaire Responses for Federal Initiatives That Foster Green Building in the Nonfederal Sector**

**Table 19: Department of Education (ED) Selected Questionnaire Responses for Initiatives That Foster Green Building in the Nonfederal Sector**

<b>Key</b>																						
1. Integrated design	7. Contracts	17. Businesses																				
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																				
3. Water conservation or efficiency	9. Grants	19. Local governments																				
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																				
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																				
6. Sustainable siting or location	12. Research and development	22. State governments																				
	13. Tax credits	23. Other																				
	14. Tax deductions																					
	15. Technical assistance																					
	16. Other																					

  

Initiative	Green building elements fostered						Types of assistance provided										Recipients expected to directly benefit						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Impact Aid Construction Program	✓	✓	✓	✓	✓	✓				✓									✓				✓
State Fiscal Stabilization Fund	✓	✓	✓	✓	✓	✓				✓									✓			✓	✓
<b>Total</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	

Source: GAO analysis of questionnaire responses.

**Table 20: Department of Energy (DOE) Selected Questionnaire Responses for Initiatives That Foster Green Building in the Nonfederal Sector**

<b>Key</b>																						
1. Integrated design	7. Contracts	17. Businesses																				
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																				
3. Water conservation or efficiency	9. Grants	19. Local governments																				
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																				
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																				
6. Sustainable siting or location	12. Research and development	22. State governments																				
	13. Tax credits	23. Other																				
	14. Tax deductions																					
	15. Technical assistance																					
	16. Other																					

  

Initiative	Green building elements fostered						Types of assistance provided										Recipients expected to directly benefit						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Building Technologies Program/Commercial Building Integration/Commercial Building Initiative	✓	✓	✓	✓	✓						✓			✓			✓	✓	✓	✓	✓	✓	
Building Technologies Program/Emerging Technologies	✓	✓	✓	✓	✓	✓					✓			✓			✓	✓	✓	✓	✓	✓	✓



**Appendix III: Selected Questionnaire  
Responses for Federal Initiatives That Foster  
Green Building in the Nonfederal Sector**

<b>Key</b>		
1. Integrated design	7. Contracts	17. Businesses
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters
3. Water conservation or efficiency	9. Grants	19. Local governments
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies
6. Sustainable siting or location	12. Research and development	22. State governments
	13. Tax credits	23. Other
	14. Tax deductions	
	15. Technical assistance	
	16. Other	

<b>Initiative</b>	<b>Green building elements fostered</b>						<b>Types of assistance provided</b>										<b>Recipients expected to directly benefit</b>						
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>
Building Technologies Program/Home Energy Score Pilot Program		✓													✓		✓	✓	✓	✓	✓	✓	✓
Building Technologies Program/Residential Buildings Integration	✓	✓		✓			✓		✓		✓				✓		✓	✓	✓	✓	✓	✓	
Building Technologies Program/Residential Buildings Integration/Solar Decathlon	✓	✓	✓	✓	✓		✓				✓				✓	✓	✓	✓		✓			✓
Building Technologies Program/Technology Validation and Market Introduction/Building Energy Codes		✓	✓								✓				✓			✓	✓	✓	✓	✓	✓
Energy Efficient Building Systems Regional Innovation Cluster Initiative	✓	✓	✓	✓	✓		✓				✓				✓		✓	✓	✓	✓			✓
Energy Transformation Acceleration Fund/Advanced Research Projects Agency/Building Energy Efficiency Through Innovative Thermodevices			✓	✓	✓	✓				✓		✓					✓	✓	✓	✓	✓	✓	✓
Small Business Innovation Research and Small Business Technology Transfer programs	✓	✓	✓	✓	✓					✓							✓						
State Energy Efficient Appliance Rebate Program		✓	✓												✓			✓					
Superior Energy Performance Program		✓													✓		✓						
Title 17 Loan Guarantee Program		✓		✓											✓		✓						

**Appendix III: Selected Questionnaire Responses for Federal Initiatives That Foster Green Building in the Nonfederal Sector**

**Key**

- |                                      |                                 |   |
|--------------------------------------|---------------------------------|---|
| 1. Integrated design                 | 7. Contracts                    | 17. Businesses                            |
| 2. Energy conservation or efficiency | 8. Direct loans                 | 18. Individual property owners or renters |
| 3. Water conservation or efficiency  | 9. Grants                       | 19. Local governments                     |
| 4. Indoor environmental quality      | 10. Mortgage-related assistance | 20. Nonprofit organizations               |
| 5. Environmental impact of materials | 11. Rent subsidies              | 21. Public housing agencies               |
| 6. Sustainable siting or location    | 12. Research and development    | 22. State governments                     |
|                                      | 13. Tax credits                 | 23. Other                                 |
|                                      | 14. Tax deductions              |   |
|                                      | 15. Technical assistance        |   |
|                                      | 16. Other                       |   |

Initiative	Green building elements fostered						Types of assistance provided										Recipients expected to directly benefit						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Weatherization and Intergovernmental Activities/Energy Efficiency and Conservation Block Grant	✓	✓	✓	✓		✓	✓	✓	✓						✓		✓	✓	✓	✓	✓	✓	✓
Weatherization and Intergovernmental Activities/State Energy Program	✓	✓	✓	✓	✓	✓			✓						✓		✓	✓	✓	✓	✓	✓	✓
Weatherization and Intergovernmental Activities/Tribal Energy Program		✓							✓						✓	✓		✓	✓		✓		✓
Weatherization and Intergovernmental Activities/Weatherization Assistance Program		✓	✓	✓					✓						✓			✓					
Weatherization Innovation Pilot Program		✓	✓	✓					✓						✓			✓					
<b>Total</b>	<b>9</b>	<b>17</b>	<b>11</b>	<b>12</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>4</b>	<b>12</b>	<b>14</b>	<b>10</b>	<b>10</b>	<b>9</b>	<b>9</b>	<b>3</b>

Source: GAO analysis of questionnaire responses.

**Appendix III: Selected Questionnaire Responses for Federal Initiatives That Foster Green Building in the Nonfederal Sector**

**Table 21: Department of Health and Human Services (HHS) Selected Questionnaire Responses for Initiative That Fosters Green Building in the Nonfederal Sector**

<b>Key</b>																						
1. Integrated design	7. Contracts	17. Businesses																				
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																				
3. Water conservation or efficiency	9. Grants	19. Local governments																				
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																				
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																				
6. Sustainable siting or location	12. Research and development	22. State governments																				
	13. Tax credits	23. Other																				
	14. Tax deductions																					
	15. Technical assistance																					
	16. Other																					

  

Initiative	Green building elements fostered						Types of assistance provided										Recipients expected to directly benefit						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Low Income Home Energy Assistance Program		✓							✓									✓					
<b>Total</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Source: GAO analysis of questionnaire responses.

**Table 22: Department of Housing and Urban Development (HUD) Selected Questionnaire Responses for Initiatives That Foster Green Building in the Nonfederal Sector**

<b>Key</b>																						
1. Integrated design	7. Contracts	17. Businesses																				
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																				
3. Water conservation or efficiency	9. Grants	19. Local governments																				
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																				
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																				
6. Sustainable siting or location	12. Research and development	22. State governments																				
	13. Tax credits	23. Other																				
	14. Tax deductions																					
	15. Technical assistance																					
	16. Other																					

  

Initiative	Green building elements fostered						Types of assistance provided										Recipients expected to directly benefit						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Capital Fund Recovery Act Competitive Grant Program	✓	✓	✓	✓	✓	✓			✓													✓	
Choice Neighborhoods	✓	✓	✓	✓	✓	✓			✓								✓	✓	✓	✓	✓		
Green Retrofit Program for Multifamily Housing	✓	✓	✓	✓	✓	✓	✓	✓	✓						✓		✓	✓		✓			
Healthy Homes Program				✓			✓	✓			✓				✓	✓	✓	✓	✓	✓	✓	✓	✓
HOME Investment Partnerships Program		✓							✓						✓			✓					

**Appendix III: Selected Questionnaire  
Responses for Federal Initiatives That Foster  
Green Building in the Nonfederal Sector**

<b>Key</b>		
1. Integrated design	7. Contracts	17. Businesses
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters
3. Water conservation or efficiency	9. Grants	19. Local governments
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies
6. Sustainable siting or location	12. Research and development	22. State governments
	13. Tax credits	23. Other
	14. Tax deductions	
	15. Technical assistance	
	16. Other	

<b>Initiative</b>	<b>Green building elements fostered</b>						<b>Types of assistance provided</b>										<b>Recipients expected to directly benefit</b>						
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>
Hope VI Revitalization Grant Program	✓	✓	✓	✓	✓	✓			✓									✓					✓
Indian Community Development Block Grant Program		✓		✓					✓									✓					✓
Indian Housing Block Grant Program		✓		✓					✓									✓					✓
Mark to Market Green Initiative	✓	✓	✓	✓	✓	✓	✓		✓						✓		✓	✓		✓			
Moving to Work Demonstration Program		✓						a			✓							✓				✓	
Multifamily Energy Innovation Fund	✓	✓	✓						✓									✓		✓			✓
PowerSaver Pilot Program		✓		✓					✓									✓					
Public Housing Environmental and Conservation Clearinghouse		✓	✓								✓								✓			✓	✓
Public Housing Operating Fund, Energy Performance Contract Incentives	✓	✓	✓	✓	✓	✓									✓			✓				✓	
Public Housing Operating Fund, Streamlining Energy Performance Contracting	✓	✓	✓	✓	✓		✓								✓			✓	✓			✓	✓
Section 203(b) Mortgage Insurance, Energy Efficient Mortgage		✓		✓					✓									✓					
Section 203(b) Mortgage Insurance, Weatherization		✓		✓					✓									✓					
Section 203(k) Mortgage Insurance, Section 203(k) Streamlined Mortgage Insurance		✓	✓	✓	✓										✓			✓		✓			✓
Supportive Housing for Persons with Disabilities (Section 811)	✓	✓	✓	✓		✓			✓	✓					✓				✓	✓	✓		
Supportive Housing for the Elderly (Section 202)	✓	✓	✓	✓		✓			✓	✓					✓						✓		
Sustainable Communities Initiative, Capacity-building Program and Tools Clearinghouse						✓									✓								✓

**Appendix III: Selected Questionnaire Responses for Federal Initiatives That Foster Green Building in the Nonfederal Sector**

Key		
1. Integrated design	7. Contracts	17. Businesses
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters
3. Water conservation or efficiency	9. Grants	19. Local governments
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies
6. Sustainable siting or location	12. Research and development	22. State governments
	13. Tax credits	23. Other
	14. Tax deductions	
	15. Technical assistance	
	16. Other	

Initiative	Green building elements fostered						Types of assistance provided										Recipients expected to directly benefit						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Sustainable Communities Initiative, Housing-Transportation Integration Research						✓	✓																✓
Sustainable Communities Initiative, Sustainable Communities Regional Planning Grants						✓			✓														✓
Sustainable Communities Initiative, Sustainable Community Challenge Grants						✓			✓														✓
Title I Property Improvement Loan Insurance Program (Title I Program)		✓	✓	✓				✓										✓					
Transformation Initiative, Energy Efficiency and Green Building Across Affordable Housing Program	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓		✓			✓	✓	✓	✓	✓		
Transformation Initiative, Green and Healthy Homes	✓	✓		✓					✓			✓		✓				✓	✓	✓			
Transformation Initiative, Sustainable Building Practice	✓	✓	✓	✓	✓	✓					✓			✓	✓		✓						✓
Transformation Initiative, Sustainable Communities Grant Program	✓	✓	✓			✓			✓		✓								✓	✓	✓	✓	✓
<b>Total</b>	<b>14</b>	<b>24</b>	<b>16</b>	<b>20</b>	<b>10</b>	<b>15</b>	<b>6</b>	<b>2</b>	<b>16</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>8</b>	<b>7</b>	<b>5</b>	<b>20</b>	<b>8</b>	<b>11</b>	<b>11</b>	<b>5</b>	<b>10</b>

Source: GAO analysis of questionnaire responses.

<sup>a</sup>GAO could not confirm with HUD whether contracts are provided under the Moving to Work Demonstration Program.

**Appendix III: Selected Questionnaire Responses for Federal Initiatives That Foster Green Building in the Nonfederal Sector**

**Table 23: Department of Transportation (DOT) Selected Questionnaire Responses for Initiatives That Foster Green Building in the Nonfederal Sector**

<b>Key</b>																								
1. Integrated design	7. Contracts	17. Businesses																						
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																						
3. Water conservation or efficiency	9. Grants	19. Local governments																						
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																						
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																						
6. Sustainable siting or location	12. Research and development	22. State governments																						
	13. Tax credits	23. Other																						
	14. Tax deductions																							
	15. Technical assistance																							
	16. Other																							
<b>Initiative</b>	<b>Green building elements fostered</b>						<b>Types of assistance provided</b>										<b>Recipients expected to directly benefit</b>							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Federal Transit Administration Bus and Bus Facilities Program		✓	✓	✓		✓										✓			✓	✓		✓	✓	
Federal Transit Administration Environmental Management Systems Training and Technical Assistance		✓	✓	✓	✓										✓	✓			✓				✓	
Federal Transit Administration Transit Investments for Greenhouse Gas and Energy Reduction	✓	✓	✓	✓	✓	✓										✓			✓	✓		✓		
Federal Transit Administration Urbanized Area Formula Program		✓	✓	✓		✓										✓			✓			✓	✓	
Formula Grants for Other than Urbanized Areas		✓	✓	✓		✓										✓			✓	✓		✓	✓	
<b>Total</b>	<b>1</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>4</b>	<b>4</b>

Source: GAO analysis of questionnaire responses.

**Appendix III: Selected Questionnaire Responses for Federal Initiatives That Foster Green Building in the Nonfederal Sector**

**Table 24: Department of the Treasury Selected Questionnaire Responses for Initiatives That Foster Green Building in the Nonfederal Sector**

<b>Key</b>																							
1. Integrated design	7. Contracts	17. Businesses																					
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																					
3. Water conservation or efficiency	9. Grants	19. Local governments																					
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																					
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																					
6. Sustainable siting or location	12. Research and development	22. State governments																					
	13. Tax credits	23. Other																					
	14. Tax deductions																						
	15. Technical assistance																						
	16. Other																						
<b>Initiative</b>	<b>Green building elements fostered</b>						<b>Types of assistance provided</b>										<b>Recipients expected to directly benefit</b>						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Accelerated Depreciation Deduction for Specified Energy Property		✓												✓			✓						
Energy Efficient Commercial Buildings Deduction		✓												✓			✓		✓		✓	✓	✓
Energy Investment Tax Credit		✓				✓								✓			✓						
New Energy Efficient Home Credit		✓												✓			✓						
Nonbusiness Energy Property Tax Credit		✓												✓					✓				
Payments for Specified Energy Property in Lieu of Tax Credits		✓																				✓	
Residential Energy Conservation Subsidy Exclusion		✓																				✓	
Residential Energy Efficient Property Credit		✓												✓								✓	
<b>Total</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>

Source: GAO analysis of questionnaire responses.

**Appendix III: Selected Questionnaire Responses for Federal Initiatives That Foster Green Building in the Nonfederal Sector**

**Table 25: Environmental Protection Agency (EPA) Selected Questionnaire Responses for Initiatives That Foster Green Building in the Nonfederal Sector**

<b>Key</b>																							
1. Integrated design	7. Contracts	17. Businesses																					
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																					
3. Water conservation or efficiency	9. Grants	19. Local governments																					
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																					
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																					
6. Sustainable siting or location	12. Research and development	22. State governments																					
	13. Tax credits	23. Other																					
	14. Tax deductions																						
	15. Technical assistance																						
	16. Other																						
<b>Initiative</b>	<b>Green building elements fostered</b>						<b>Types of assistance provided</b>										<b>Recipients expected to directly benefit</b>						
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>
Brownfields Program						✓			✓						✓		✓		✓	✓		✓	
Design for the Environment Program				✓	✓							✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
Energy Star Program	✓	✓	✓	✓											✓	✓	✓	✓	✓	✓	✓	✓	✓
Environmentally Preferable Purchasing Program	✓	✓	✓	✓	✓	✓									✓								✓
Environmentally Responsible Redevelopment and Reuse	✓	✓	✓	✓	✓	✓									✓	✓	✓	✓	✓	✓	✓	✓	✓
Green Communities Program	✓	✓	✓	✓	✓	✓										✓			✓	✓		✓	
Green Infrastructure Program	✓	✓	✓		✓	✓		✓				✓			✓		✓	✓	✓	✓	✓	✓	✓
Green Power Partnership	✓	✓													✓	✓	✓		✓	✓	✓	✓	
Healthy Communities—Clean, Green, and Healthy Schools	✓	✓	✓	✓		✓									✓				✓	✓		✓	✓
Heat Island Reduction Program		✓				✓			✓						✓		✓	✓	✓	✓	✓	✓	✓
Indoor Environments Program	✓	✓		✓		✓	✓		✓						✓	✓	✓	✓	✓	✓	✓	✓	✓
Industrial Materials Recycling Program					✓										✓		✓		✓	✓		✓	
Pesticide Environmental Stewardship Program	✓			✓		✓			✓			✓			✓		✓	✓	✓	✓	✓	✓	✓
Small Business Innovation Research Program		✓	✓	✓	✓		✓					✓					✓	✓	✓				✓
Smart Growth Program		✓	✓			✓	✓		✓			✓			✓		✓	✓	✓	✓	✓	✓	✓
Tribal Green Building Initiative	✓	✓	✓	✓	✓	✓	✓		✓						✓		✓	✓	✓				✓
WasteWise	✓				✓										✓		✓		✓	✓		✓	
WaterSense			✓			✓									✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Total</b>	<b>11</b>	<b>12</b>	<b>10</b>	<b>10</b>	<b>9</b>	<b>12</b>	<b>4</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>7</b>	<b>15</b>	<b>11</b>	<b>17</b>	<b>15</b>	<b>10</b>	<b>16</b>	<b>6</b>

Source: GAO analysis of questionnaire responses.



**Appendix III: Selected Questionnaire Responses for Federal Initiatives That Foster Green Building in the Nonfederal Sector**

**Table 26: Small Business Administration (SBA) Selected Questionnaire Responses for Initiatives That Foster Green Building in the Nonfederal Sector**

<b>Key</b>																							
1. Integrated design	7. Contracts	17. Businesses																					
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																					
3. Water conservation or efficiency	9. Grants	19. Local governments																					
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																					
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																					
6. Sustainable siting or location	12. Research and development	22. State governments																					
	13. Tax credits	23. Other																					
	14. Tax deductions																						
	15. Technical assistance																						
	16. Other																						
Initiative	Green building elements fostered						Types of assistance provided										Recipients expected to directly benefit						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Certified Development Company 504 Loan Program		✓		✓	✓	✓									✓		✓						
Small Business Energy Audit and Energy Efficiency Program	✓	✓	✓	✓	✓	✓			✓						✓		✓						✓
<b>Total</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>

Source: GAO analysis of questionnaire responses.

**Table 27: Total for All Agencies—Selected Questionnaire Responses for Initiatives That Foster Green Building in the Nonfederal Sector**

<b>Key</b>																							
1. Integrated design	7. Contracts	17. Businesses																					
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters																					
3. Water conservation or efficiency	9. Grants	19. Local governments																					
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations																					
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies																					
6. Sustainable siting or location	12. Research and development	22. State governments																					
	13. Tax credits	23. Other																					
	14. Tax deductions																						
	15. Technical assistance																						
	16. Other																						
Agency	Green building elements fostered						Types of assistance provided										Recipients expected to directly benefit						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
USDA	6	8	5	5	4	4	2	5	5	2	0	0	0	0	3	2	7	6	6	5	4	6	5
NIST	3	3	0	3	3	0	0	0	3	0	0	3	0	0	3	0	0	0	0	0	0	0	3
DOD	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	1
ED	2	2	2	2	2	2	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	1	2
DOE	9	17	11	12	7	3	4	1	8	0	0	7	0	0	13	4	12	14	10	10	9	9	3

**Appendix III: Selected Questionnaire  
Responses for Federal Initiatives That Foster  
Green Building in the Nonfederal Sector**

<b>Key</b>		
1. Integrated design	7. Contracts	17. Businesses
2. Energy conservation or efficiency	8. Direct loans	18. Individual property owners or renters
3. Water conservation or efficiency	9. Grants	19. Local governments
4. Indoor environmental quality	10. Mortgage-related assistance	20. Nonprofit organizations
5. Environmental impact of materials	11. Rent subsidies	21. Public housing agencies
6. Sustainable siting or location	12. Research and development	22. State governments
	13. Tax credits	23. Other
	14. Tax deductions	
	15. Technical assistance	
	16. Other	

<b>Agency</b>	<b>Green building elements fostered</b>						<b>Types of assistance provided</b>										<b>Recipients expected to directly benefit</b>						
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>
HHS	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
HUD	14	24	16	20	10	15	6	2	16	4	4	5	1	0	8	7	5	20	8	11	11	5	10
DOT	1	5	5	5	2	4	0	0	4	0	0	0	0	0	1	1	0	0	5	3	0	4	4
Treasury	0	8	0	0	0	1	0	0	1	0	0	0	4	3	0	0	5	3	1	0	1	1	1
EPA	11	12	10	10	9	12	4	1	6	0	0	5	0	0	16	7	15	11	17	15	10	16	6
SBA	1	2	1	2	2	2	0	0	1	0	0	0	0	0	1	1	2	0	0	0	0	0	1
<b>Total</b>	<b>48</b>	<b>83</b>	<b>51</b>	<b>60</b>	<b>39</b>	<b>43</b>	<b>16</b>	<b>9</b>	<b>47</b>	<b>6</b>	<b>4</b>	<b>21</b>	<b>5</b>	<b>3</b>	<b>45</b>	<b>22</b>	<b>47</b>	<b>55</b>	<b>49</b>	<b>45</b>	<b>35</b>	<b>42</b>	<b>36</b>

Source: GAO analysis of questionnaire responses.

# Appendix IV: GAO's Questionnaire for Federal Agencies with Initiatives That Foster Green Building in the Nonfederal Sector



## United States Government Accountability Office

### QUESTIONS ABOUT FEDERAL INITIATIVES TO FOSTER GREEN BUILDING AMONG LOCAL, STATE, AND PRIVATE ENTITIES

#### Introduction

The United States Government Accountability Office (GAO), an independent, legislative branch agency, is examining how the federal government is fostering green building among local, state, and private entities across the United States—that is, for buildings that are not owned or leased by the federal government. GAO is undertaking this work at the request of the Chairman of the Subcommittee on Federal Financial Management, Government Information, Federal Services, and International Security of the Senate Committee on Homeland Security and Governmental Affairs. Specifically, we are first seeking to identify federal government initiatives to foster green building among local, state, and private entities active during fiscal year 2011, including those funded by the American Recovery and Reinvestment Act of 2009 (ARRA). Second, we are seeking to collect certain information about these initiatives, including the progress federal agencies are making and the challenges they face, if any, in implementing them.

For our purposes, a *green building* is one that, through the design, building, rehabilitation, and/or maintenance or operation of the building, incorporates one or more of the following: (1) integrated design principles, (2) energy conservation or efficiency measures, (3) water conservation or efficiency measures, (4) indoor environmental quality measures, (5) measures to reduce the environmental impact of materials, or (6) sustainable siting or location measures.

For our purposes, a *green building initiative* is any program or activity related to one or more of these six elements, regardless of funding, that an agency is implementing for the purpose of fostering green building among local, state, and private entities. These initiatives may include direct financial support, research and development, technical assistance, tax credits, tax deductions or other types of support or assistance provided by the federal government to local, state, and private entities.

Through this questionnaire, we are asking federal agencies to provide certain information about the initiatives that we have identified. After we have gathered the responses, we plan to speak with pertinent agency officials to discuss in more detail the agency's role in implementing the initiatives and to collect other information related to this review, such as the progress that the agency has made in implementing the initiative and the challenges it has faced, if any.

Please complete this questionnaire and return it to one of the individuals mentioned below by May 5, 2011. When returning the questionnaire, please attach any relevant supporting documentation to your email.

If you have any questions or comments about this questionnaire, please call or e-mail John Barrett at (202) 512-5902 ([barrettj@gao.gov](mailto:barrettj@gao.gov)) or Nathan Morris at (617) 788-0553 ([morrisn@gao.gov](mailto:morrisn@gao.gov)). Thank you very much for your assistance.

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**Appendix IV: GAO's Questionnaire for Federal  
Agencies with Initiatives That Foster Green  
Building in the Nonfederal Sector**

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**Instructions**

This questionnaire can be filled out using MS-Word and returned via e-mail to [barrettj@gao.gov](mailto:barrettj@gao.gov) or [morrisn@gao.gov](mailto:morrisn@gao.gov). Please complete this questionnaire and return it by **May 5, 2011**.

- Please use your mouse to navigate by clicking on the field or check box  you wish to answer.
- To select a check box or button, simply click on the center of the box and an 'X' will appear.
- To change or deselect a check box response, simply click on the check box and the 'X' will disappear.
- To answer a question that requires that you write a comment, click on the answer box  and begin typing. The box will expand to accommodate your answer.

**SECTION I: GENERAL INFORMATION FOR INITIATIVE**

We have collected some preliminary information on your initiative, which is listed below.

- a) **Initiative Title:** [Pre-populated information]
- b) **Implementing Agency:** [Pre-populated information]
- c) **Implementing Office:** [Pre-populated information]
- d) **Description:** [Pre-populated information]

1) Is the information provided above about the initiative correct and complete?

- Yes .....
- No .....

If you answered No, what information is incorrect or incomplete, and what is the correct or complete information? Please use the space provided below.

█

2) Has this initiative been active at your agency at any time during fiscal year 2011?

- Yes .....
- No .....

If you answered No, please explain in the space provided below.

█

Appendix IV: GAO's Questionnaire for Federal Agencies with Initiatives That Foster Green Building in the Nonfederal Sector

3) Is your agency required to implement this initiative by statute, executive order or other mandate external to the agency?

	Yes ▼	No ▼	Not Sure ▼
a) Statute?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Executive Order?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Other mandate external to the agency?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Other? [Please specify] .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

└─┬─┘

If you answered Yes to any of the above, please provide the name or citation for the specific statute(s), executive order(s) or other mandate(s) in the space provided below.

If you answered No to all of the above, please explain the impetus for the initiative in the space provided below.

4) Does your agency have documents describing how this initiative should be implemented?

Yes .....  
 No.....

If Yes, please provide electronic copies of these documents when returning this questionnaire or provide link(s) to the relevant website(s) in the space provided below.

Appendix IV: GAO's Questionnaire for Federal Agencies with Initiatives That Foster Green Building in the Nonfederal Sector

5) For our purposes, a *green building* is one that, through the design, building, rehabilitation, and/or maintenance or operation of the building, incorporates one or more of the elements defined below. Additionally, a *green building initiative* is any program or activity related to one of these six elements, regardless of funding, that an agency is implementing for the purpose of fostering green building among local, state, and private entities.

Based on the definitions below, which of the following element(s) of green building pertain to this initiative?

	Yes ▼	No ▼	Not Sure ▼
a) <b>Integrated design:</b> <i>Integrated design can</i> involve the use of a collaborative, integrated planning and design process that initiates and maintains an integrated project team in all stages of a building's lifecycle, including planning, building, and deconstruction. <i>Integrated design can</i> also entail the use of ongoing maintenance and operation to verify performance of building components and systems and help ensure that design requirements are met.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) <b>Energy conservation/efficiency:</b> The <i>energy conservation/efficiency</i> element can involve the use of strategies to reduce energy consumption, such as through ongoing maintenance; energy use monitoring; efficient design and construction; efficient appliances, systems and lighting; the use of renewable and clean sources of energy generated on-site or off-site; and other innovative strategies...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) <b>Water conservation/efficiency:</b> The <i>water conservation/efficiency</i> element can involve the use of various strategies to reduce water consumption inside and outside the building, such as through more efficient appliances, fixtures and fittings inside and water-wise landscaping outside. ....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) <b>Indoor environmental quality:</b> The <i>indoor environmental quality</i> element can involve the use of various strategies to enhance indoor environmental quality through ventilation, thermal comfort, acoustics, moisture control, daylighting, pollution source control, and the use of low-emission materials. ....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) <b>Environmental impact of materials:</b> The <i>environmental impact of materials</i> element can involve the use of various strategies to reduce the environmental impact of materials such as using sustainably grown, harvested, and transported products and materials; using products with high recycled and/or biobased content; reducing or eliminating the use of ozone depleting compounds; and promoting the reduction of waste through reuse and recycling. ....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) <b>Sustainable siting or location:</b> The <i>sustainable siting or location</i> element can involve using certain strategies when deciding on building location, including discouraging development on previously undeveloped land; minimizing a building's impact on ecosystems and waterways; encouraging regionally appropriate landscaping; rewarding smart transportation choices; controlling stormwater runoff; and reducing erosion, light pollution, heat island effect and construction-related pollution. ....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix IV: GAO's Questionnaire for Federal Agencies with Initiatives That Foster Green Building in the Nonfederal Sector

If needed, please use the space provided below to provide further details regarding your answers above.

If you answered No to all green building elements listed above, please stop and return this questionnaire or contact us to discuss whether your initiative should be included in our review (see page one for contact information). Thank you very much for your time.

6) For this initiative, what type(s) of assistance or support does it provide to foster green building?

	Yes ▼	No ▼	Not Sure ▼
a) Contracts? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Direct loans? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Grants? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Mortgage-related assistance? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Rent subsidies? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Research and development? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Tax credits? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Tax deductions? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Technical assistance? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Other? [Please specify] .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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If needed, please use the space provided below to provide further details regarding your answers above.



Appendix IV: GAO's Questionnaire for Federal Agencies with Initiatives That Foster Green Building in the Nonfederal Sector

7) What type(s) of buildings are eligible for this initiative?

	Yes ▼	No ▼	Not Sure ▼
a) Education? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Hospital / Health Care? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Industrial? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Laboratory? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Lodging? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Office? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Residential (owner-occupied or rental property)? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Retail? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Warehouse? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Other? <i>[Please specify]</i> .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Appendix IV: GAO's Questionnaire for Federal Agencies with Initiatives That Foster Green Building in the Nonfederal Sector

8) Which entities are expected to directly benefit from the assistance or support provided by this initiative?

	Yes ▼	No ▼	Not Sure ▼
a) Businesses? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Individual property owners or renters? ....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Local governments? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Nonprofit organizations? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Public housing agencies? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) State governments? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Other? [Please specify] .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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9) If possible, please describe two or three examples of specific projects funded or supported by this initiative in the space provided below.

If needed, please use the space provided below to provide further details about your answers in Section I of this questionnaire.

**SECTION II: FUNDING FOR INITIATIVE**

10) For each of the following, please indicate whether your agency dedicated funds to this initiative. "Dedicated funds" means that the Congress or the agency set aside money to fund the initiative.

	Yes ▼	No ▼	Not Sure ▼
a) From the American Recovery and Reinvestment Act of 2009 (ARRA)? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) In fiscal year 2009 (excluding ARRA)? ....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) In fiscal year 2010? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) In fiscal year 2011? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix IV: GAO's Questionnaire for Federal Agencies with Initiatives That Foster Green Building in the Nonfederal Sector

11) If you answered Yes to any of the above in Question 10, please provide the exact or estimated amount dedicated to the green building portion of this initiative. *Please round to the nearest \$100,000 (e.g., \$1.2 million).*

	Funds Dedicated (\$million)	If estimated, please describe how this estimate was determined
a) From the American Recovery and Reinvestment Act of 2009 (ARRA)? .....	\$ _____	_____
b) In fiscal year 2009 (excluding ARRA)? .....	\$ _____	_____
c) In fiscal year 2010? .....	\$ _____	_____
d) In fiscal year 2011? .....	\$ _____	_____

For your answers above in Question 11, please provide electronic copies of any relevant budget documents when returning this questionnaire. If these documents are not available, please explain in the space provided below.

\_\_\_\_\_

For your answers above in Question 11, if needed, please use the space provided below to further explain any limitations in estimating the funds dedicated to the green building portion of this initiative.

\_\_\_\_\_

**Appendix IV: GAO's Questionnaire for Federal Agencies with Initiatives That Foster Green Building in the Nonfederal Sector**

12) Does this initiative, or any portion of it, currently have an expiration date?

- Yes .....
- No .....
- Not Sure .....
- Not Applicable .....

If you answered Yes, please provide date:

If you answered Yes, and if only a portion of the initiative is set to expire, please provide details on the portion that is set to expire in the space provided below.

If you answered Yes, please provide electronic copies of documents supporting this expiration date when returning this questionnaire or provide link(s) to the relevant website(s) in the space provided below. If these documents are not available, please explain in the space provided below.

If needed, please use the space provided below to provide further details about your answers in Section II of this questionnaire.

**SECTION III: GOALS AND PERFORMANCE METRICS FOR INITIATIVE**

13) Has your agency established goals for the green building portion of this initiative?

- Yes .....
- No.....
- Not Sure .....
- Not Applicable.....

If you answered Not Sure or Not Applicable, please explain using the space provided below.

■

If you answered Yes, does your agency have documents describing the goals for the green building portion of this initiative?

- Yes .....
- No.....
- Not Sure .....
- Not Applicable.....

If you answered Not Sure or Not Applicable, please explain using the space provided below.

■

If you answered Yes, please provide electronic copies of these documents when returning this questionnaire or provide link(s) to the relevant website(s) in the space provided below. If these documents are not available, please explain in the space provided below.

■

Appendix IV: GAO's Questionnaire for Federal Agencies with Initiatives That Foster Green Building in the Nonfederal Sector

14) Has your agency established performance metrics or measures for the green building portion of this initiative?

- Yes .....
- No.....
- Not Sure .....
- Not Applicable.....

If you answered Not Sure or Not Applicable, please explain using the space provided below.

■

If you answered Yes, does your agency have documents describing the performance metrics or measures for this initiative?

- Yes .....
- No.....
- Not Sure .....
- Not Applicable.....

If you answered Not Sure or Not Applicable, please explain in the space provided below.

■

If you answered Yes, please provide electronic copies of these documents when returning this questionnaire or provide link(s) to the relevant website(s) in the space provided below. If these documents are not available, please explain in the space provided below.

■

If needed, please use the space provided to provide further details about your answers in Section III of this questionnaire.

■

**SECTION IV: OTHER INFORMATION FOR INITIATIVE**

15) Are there any additional data, further sources of information, or comments that would help us further understand and report on how this initiative is being implemented? If so, please describe and/or provide link(s) to the relevant website(s) in the space provided below. If applicable, please provide electronic copies of the relevant documents when returning this questionnaire. Alternatively, you can suggest that further discussion about this initiative be conducted through follow-up conversations with GAO.

■

16) Please provide the contact information for a representative from your agency for follow-up questions we may have about this initiative:

Agency/Organization: ■

Contact Name: ■

Email: ■

Phone: ■

Please remember to attach any relevant supporting documentation when returning this questionnaire to either [barrettj@gao.gov](mailto:barrettj@gao.gov) or [morrisn@gao.gov](mailto:morrisn@gao.gov).

**Thank you for your time!**

# Appendix V: Comments from the Department of Energy



## Department of Energy

Washington, DC 20585

October 28, 2011

Mr. Frank Rusco  
Director  
Natural Resources and Environment  
United States Government Accountability Office  
Washington, DC 20548

Dear Mr. Rusco:

This letter responds to the recommendations for executive action contained in the U.S. General Accountability Office (GAO) report, *GREEN BUILDING: Federal Initiatives for the Nonfederal Sector Could Benefit from More Interagency Collaboration (GAO-12-79)*. Specifically, the report recommends the following action:

- To help assess the results of the investments in individual federal initiatives to foster green building in the nonfederal sector, as well as their combined results, the Secretaries of Energy and of Housing and Urban Development should work with the Administrator of EPA to take the lead in developing an approach-including, if necessary, exploring the need for any additional legislative or executive authority, such as the authority to establish a coordinating entity (e.g., an interagency working group)-with the other eight federal agencies that implemented the initiatives to collaborate on identifying performance information, such as shared goals and common performance measures, for green building initiatives for the nonfederal sector.

Recognizing the need for increased interagency collaboration, in 2009 DOE and EPA signed a Memorandum of Understanding (MOU) to enhance and expand federal programs, including the Energy Star and the National Building Rating Program, to advance energy efficiency which is critical to addressing climate change, economic, and energy security issues. The ENERGY STAR label identifies top performing, cost-effective products, homes, and buildings. The National Building Rating program will provide efficiency ratings and assessments of cost-effective improvements for homes and buildings. The MOU helps ensure that this collaborative effort will be effective, efficient and avoid duplication. It also will help ensure effective communication with other Agencies and stakeholders, maximize the use of resources, and build upon Agency and stakeholder efforts to date.

Although we maintain that the key recommendation for executive action is correct and have taken measures to further engage other agencies, we would like to emphasize certain differences between the federal and non-federal sectors that make efforts to identify performance measures challenging. As part of its conclusion, GAO states on page 20 of the report that, "Because federal agencies have experience with measuring progress in the federal sector, they are well positioned to apply this experience to measuring such progress in the non-federal sector as well." Although this may seem obvious, there are critical differences



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between these two sectors. While the federal government can easily collect performance information on federal buildings, it is not the case in the private sector. In many instances, the private building owners though willing to make "green" improvements, are disinclined to monitor the resulting benefits (energy or water saved, for example). The federal government may not be able to require monitoring in all instances from the non-federal sector to measure progress.

We look forward to continuing to work with GAO on helping the federal government meet its energy goals for the non-federal sector. If you have any questions concerning the report or our response, please contact me or Mr. Roland Risser, Program Manager, Buildings Technologies Program at (202) 287-1691.

Sincerely,



Kathleen B. Hogan  
Deputy Assistant Secretary for Energy Efficiency  
Office of Energy Efficiency and Renewable Energy

# Appendix VI: Comments from the Department of Housing and Urban Development



U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
Washington, D.C. 20410-0003

OFFICE OF DEPARTMENTAL OPERATIONS  
AND COORDINATION

OCT 21 2011

Mr. Chad M. Gorman  
Senior Analyst, Natural Resources & Environment  
U.S. Government Accountability Office (GAO)  
301 Howard St., Suite 1200  
San Francisco, CA 94105

Dear Mr. Gorman,

Thank you for the opportunity to comment on the Government Accountability Office (GAO) draft report GAO-12-79, entitled "Green Building: Federal Initiatives for the Nonfederal Sector Could Benefit from More Interagency Collaboration."

The focus of this draft report was to identify current initiatives by federal agencies to foster green building in the nonfederal sector; and to determine what is known about the results of these initiatives. As part of the review, GAO sent questionnaires to the 11 agencies implementing the initiatives identified, including the U.S. Department of Housing and Urban Development (HUD); examined HUD documents; and spoke with HUD officials. GAO identified 95 federal initiatives implemented by those 11 agencies. About two-thirds of these initiatives are implemented by HUD (29 initiatives), EPA (18), and DOE (17). GAO recommends that HUD, DOE, and EPA work together to develop and implement an approach for the 11 agencies to collaborate on assessing the results of federal green building initiatives for the nonfederal sector. HUD welcomes this recommendation.

Our edits to the draft report are attached. General comments were provided by individual program offices that identify areas in the draft report, either in the introduction or in an appendix, which HUD found to be ambiguous or require further clarification.

HUD would like to express its appreciation for the opportunity to participate in GAO's Green Building Initiatives review. HUD recognizes the professional and courteous manner in which GAO staff worked with HUD staff to obtain the information and data needed to complete its review and issue its draft report.

Sincerely,

A handwritten signature in cursive script, appearing to read "Inez Banks-Dubose".

Inez Banks-Dubose  
Director, Office of Departmental  
Operations and Coordination

Enclosure

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# Appendix VII: GAO Contacts and Staff Acknowledgments

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## GAO Contacts

Frank Rusco, (202) 512-3841 or [ruscof@gao.gov](mailto:ruscof@gao.gov); or David J. Wise, (202) 512-2834 or [wised@gao.gov](mailto:wised@gao.gov)

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## Staff Acknowledgments

In addition to the contacts named above, Karla Springer (Assistant Director), Maria Edelstein (Assistant Director), John Barrett, Cindy Gilbert, Chad M. Gorman, Gary Guggolz, Nathan Morris, Carol Herrnsstadt Shulman, and Barbara Timmerman made key contributions to this report.

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U.S. Government Accountability Office, 441 G Street NW, Room 7125  
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