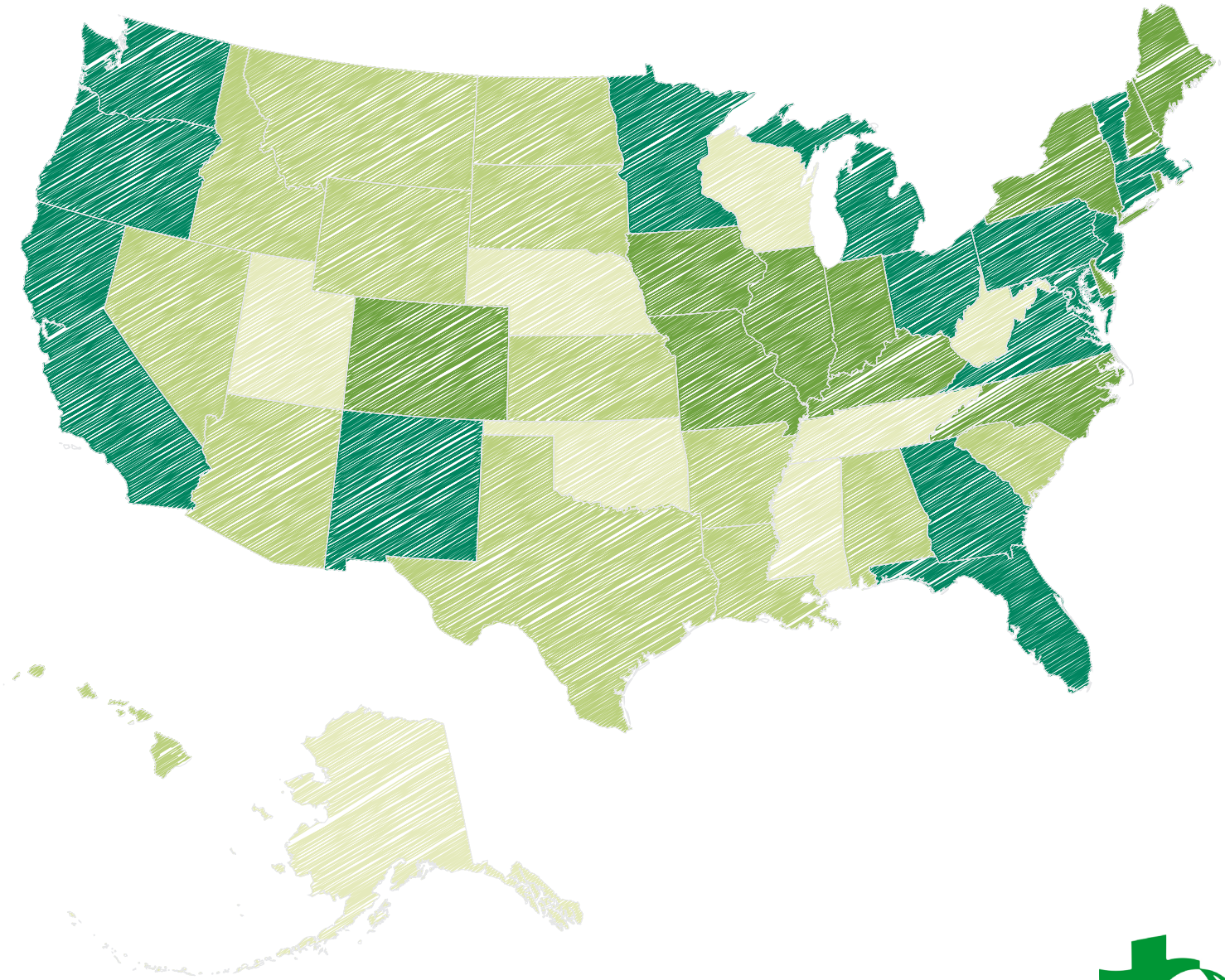
PROGRESS AND POSSIBILITY:

Green Building Criteria in Low-Income Housing Tax Credit Programs

2012 QAP ANALYSIS



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GLOBAL GREEN USA®

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Global Green USA is the American affiliate of Green Cross International, founded by President Gorbachev, to foster a global value shift toward a sustainable and secure future. For nearly 20 years, Global Green USA has been a national leader in advocating for smart solutions to global warming, including green building for affordable housing, schools, cities and communities that save money, improve health, and create green jobs.

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NeighborWorks America is one of the country's preeminent leaders in affordable housing and community development. Headquartered in Washington, D.C. Neighborworks strives to create opportunities for lower-income people to live in affordable homes in safe, sustainable neighborhoods that are healthy places for families to grow.

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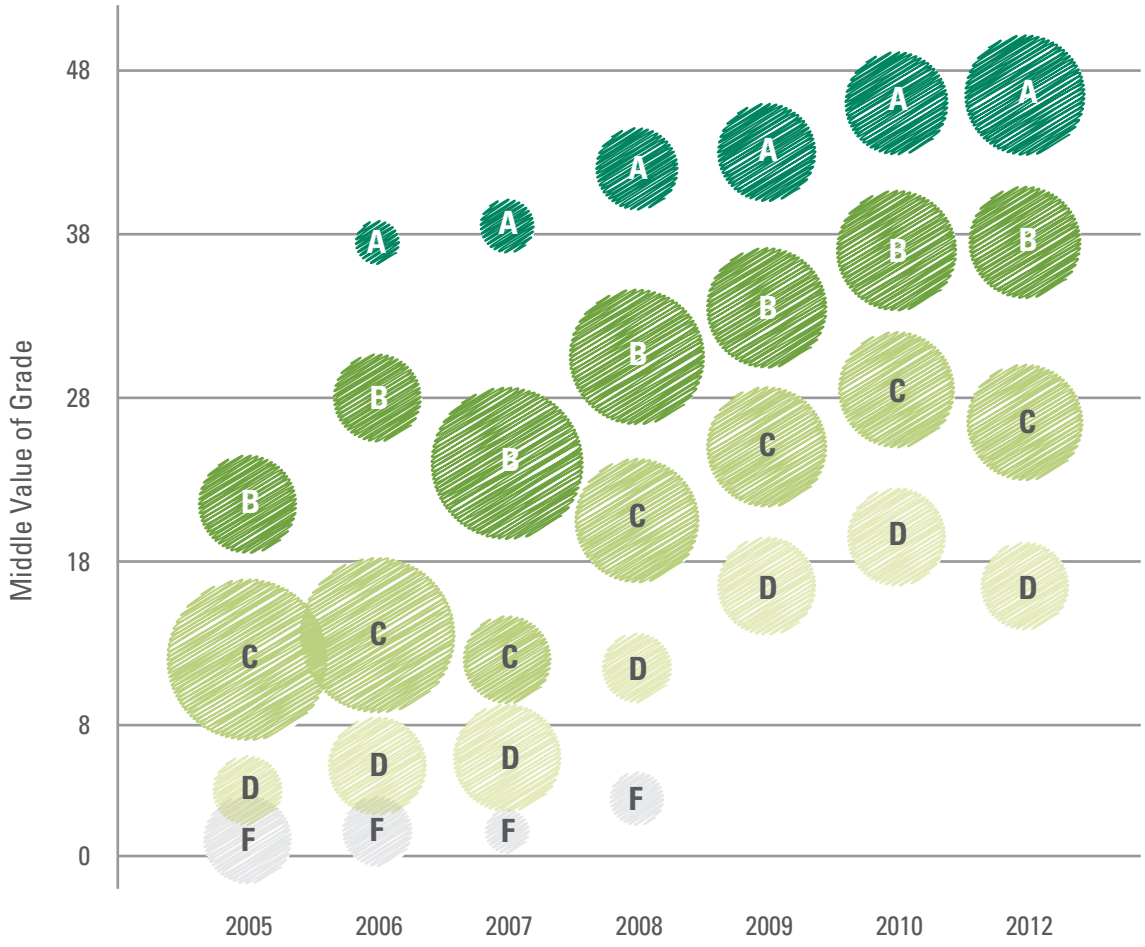
EXECUTIVE SUMMARY

Fifteen years ago, Global Green USA launched its Greening Affordable Housing Initiative and began its ongoing work to improve the environmental and health aspects of publicly subsidized housing. Through technical assistance, research, stakeholder education, and policy development, Global Green USA continues to promote healthy and efficient affordable housing and we are moving ever closer to our goal of having all publicly subsidized housing built to green standards by 2014.

Over the past decade, green building strategies have become increasingly integrated into the nearly 100,000 units constructed annually under the Federal Low-Income Housing Tax Credit (LIHTC) program, and significant strides have been made toward producing higher quality, more efficient dwellings that mitigate negative environmental impacts.

Global Green USA has long recognized that the LIHTC program and the state-level Qualified Allocation Plans (QAPs) that guide the distribution of the tax credits are an effective means to increase the adoption of green building criteria in affordable housing design and construction. Since 2006,

Figure 1. Change in Grades, 2005-2012



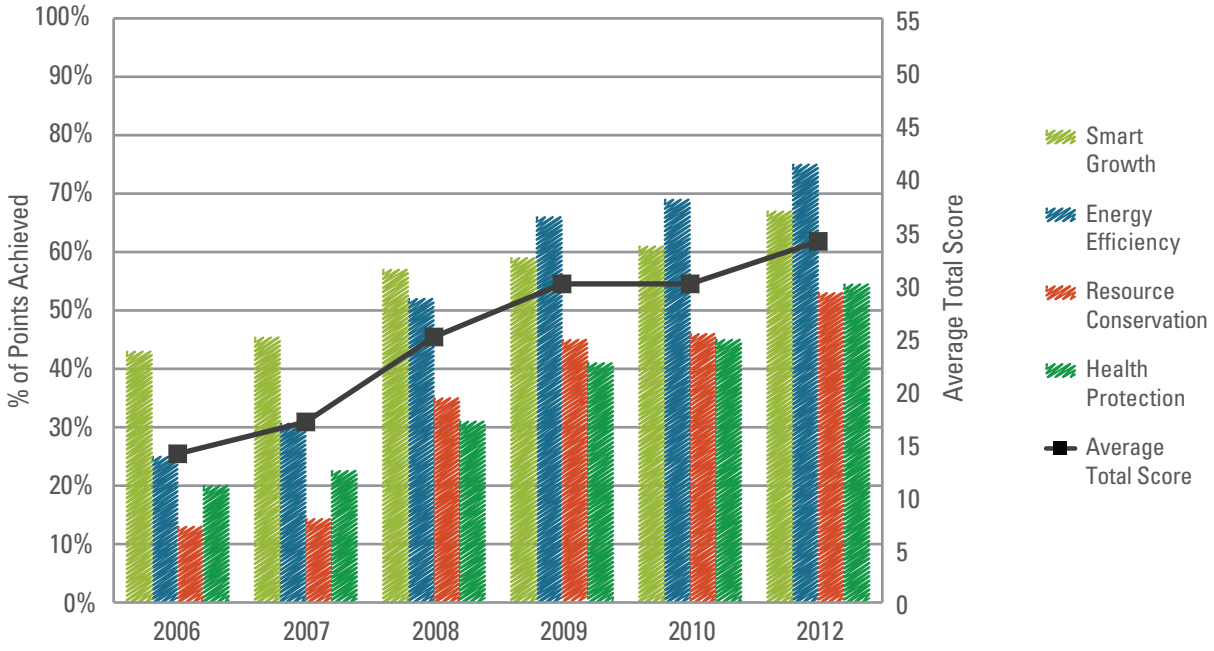
we have completed a regular review of QAPs and established a national performance ranking for the green building practices promoted by the QAPs. The goal of the analysis is to identify leading trends, share best practices, and identify technical, procedural, and policy options that can further increase the incorporation of green building strategies into affordable housing developments.

As in past years, QAPs in all 50 states were analyzed and ranked on a 50-point scale comprised of 32 subtopics distributed across the categories of Smart Growth, Energy Efficiency, Resource Conservation, and Health Protection, with five bonus points available for states that demonstrate a strong commitment to robust implementation of the technical criteria. This year we created an optional pathway for states in which a majority of projects use a third-party green building certification program such as the U.S. Green Building Council's LEED rating system, Enterprise Community Partners' Green Communities Initiative, or a regional green building program such as Southface Energy Institute's EarthCraft. All state housing agencies were also invited to participate in a half-hour, semi-structured phone interview. The results of these interviews were used to assign points to the bonus category and to survey the types sustainable building practices being applied across differing political, economic, and environmental climates.

Since 2006, the first year of our analysis, the adoption of green building measures in QAPs has grown steadily each year **[Figure 1]**. 2012 is no exception, with this year's average score of 31 representing a 20% increase from 2010's average of 26. The median, or middle value of the scores, also increased by more than 20% in the past two years, from 25 to 30.5. As in previous years, Energy Efficiency is the most thoroughly addressed category. States achieved 75% of all possible points in Energy Efficiency, up from 72% in 2010. Smart growth increased from 66% to 71%, while Resource Conservation remains unchanged from 2010, with 51% of all possible points achieved. Health Protection made the single greatest categorical increase from 2010 to 2012, with states achieving 8% more points this year, reaching 54% of all possible points **[Figure 2]**. Connecticut and Maryland are the first states since the evaluation began to receive perfect scores. New Jersey and Washington received A's, and twelve more states achieved an A-. Altogether, 30% of states scored an A- or better in 2012, and 26% of states scored in the B range. 28% are in the C range, and only 16% of all states received a D in our ranking system.

Green building in the Low Income Housing Tax Credit program has clearly reached a critical mass across the nation, with 47% of total LIHTC funds nationwide going to states that achieved an A- or better in our 2012 rankings and 72% of states receiving a B- or better. This achievement has largely been the result of individual state-by-state initiatives, rather than comprehensive federal action. This shows a national awareness of the benefits of green buildings to low-income housing development combined with the willingness of individual states to take the initiative to identify how to best implement green practices in the projects they fund. At the same time, there remain a number of states that continue to achieve subpar scores in our evaluation, which demonstrates that work remains to be done in ensuring that all housing built with

Figure 2. Six Year QAP Trends (2006-2012)



public subsidy offers the economic, health, and environmental benefits provided by green building and sustainable development practices.

In addition to determining the scoring bonus, the interviews explored key variables that influence the incorporation of green and sustainable criteria into a state's QAP. Of the 50 states invited to participate in the interviews, 34 agreed to a half-hour phone interview, a response rate of 68%. The interviews identified a number of thematic areas related to incorporating green building into QAPs including the level of green building experience among state staff, the experiences of developers, the different methods of compliance monitoring, the perspective on the relationship between cost and long-term value, and challenges applying green standards to rehab.

Based on the results of the analysis, Global Green USA offers the following recommendations to states and federal policymakers, affordable housing stakeholders, and the green building community to expand the scope, rigor, and implementation of green measures in QAPs.

1. Update IRS Section 42 to require that QAPs include health criteria and water conservation
2. Use established tools and metrics to define smart growth and sustainable neighborhood QAP criteria
3. Standardize the assessment process and energy performance expectations for rehab
4. Require energy monitoring/reporting, and establish standard methods for quantifying environmental and health benefits of green building
5. Require independent verification of green building measures

Implementing these recommendations will require a concerted collaborative effort that includes developers, state and federal agencies, investors, and the green building community. Some of the collaborative efforts will need to focus on solving complex technical issues such as monitoring practices and benefit quantification. In other instances, the focus will need to be on standardizing processes, such as determining how to approach rehabilitation projects or specifying smart growth criteria. Changes to codes and federal regulation will require a combination of technical and policy expertise, combined with a strong and diverse coalition of supporters.

Looking forward there remains the need for additional information on the practices being implemented in individual states, particularly related to the green building measures and certifications that are being achieved by specific projects. There is also an opportunity to increase the sharing of best practices among the states, through conference presentations, workshops, and updates to HUDs LIHTC database. The National Council of State Housing Agencies (NCSHA) provides an excellent platform for this type of peer-to-peer exchange that enables continual improvement.

Finally, the scope of green affordable housing efforts needs to expand beyond tax-credit funded projects. This includes funding sources such as the Department of Agriculture Rural Housing Section 514/516, HUD Section 202 and 818, HUD Choice Neighborhoods, and potentially Section 8. Green criteria is currently present in a number of the above funding sources to varying degrees. The possibility exists to streamline these requirements so they are consistent with LIHTC requirements, thus facilitating the process for both developers and agency staff.

Global Green USA looks forward to pursuing the recommendations and next steps over the coming years in collaboration with the diverse stakeholders invested in, and committed to, improving the quality and livability of the nation's publicly subsidized housing.

INTRODUCTION

Fifteen years ago, Global Green USA launched its Greening Affordable Housing Initiative and began its ongoing work to improve the environmental and health aspects of publicly subsidized housing. Through technical assistance, research, stakeholder education, and policy development, Global Green USA continues to advance healthy and efficient affordable housing, and we are moving ever closer to our goal of having all publicly subsidized housing built to green standards by 2014.

Until recently, much of the nation's affordable housing was substandard, due to lowest cost decision-making in the traditional design and construction process. Families were burdened with high utility costs and detrimental health impacts. Furthermore, low-income housing was often built on sites selected mainly based on the availability of low-cost land, without considering access to transit, employment, services, or community facilities. Taken together, these factors can place stress on families as utility and transportation costs take precedence over quality food, health care, and education. Instead of helping families improve their economic standing, poorly designed affordable housing can contribute to the economic stagnation of the working poor. Low-quality housing also causes negative impacts on the regional and global environment. Excess use of energy, water, and building materials depletes limited resources and contributes to global climate change.

Over the past decade, green building strategies have become increasingly integrated into the nearly 100,000 units constructed annually under the Low-Income Housing Tax Credit (LIHTC) program, and significant strides have been made toward

Rio Vista Family Apartments is an urban infill development in Northeast Los Angeles. Developed by Abode Communities, the LEED Platinum project features solar thermal, photovoltaic, constant fresh air circulation, healthy materials, energy efficient lighting and appliances, and rooftop gardening plots.

producing higher quality, more efficient dwellings that mitigate negative environmental impacts. These benefits include a 20% or more reduction in utility costs; dramatically reduced or eliminated exposure to formaldehyde, volatile organic compounds (VOCs), other environmental toxins, and asthma triggers; reductions in transportation costs; 50% or more reduction in construction waste; 20% reduction in water use; and reductions in greenhouse gas emissions. Green affordable housing projects also help revitalize communities by considering proximity to transportation, infrastructure, jobs, and services.

Global Green USA has long recognized that the LIHTC program and the state Qualified Allocation Plans (QAPs) that guide the distribution of the tax credits are an effective means to increase the adoption of green building criteria in affordable housing design and construction. Since 2006, we have completed a regular review of QAPs and established a national performance ranking for the green building practices promoted by the QAPs. This ranking enables us to highlight successful approaches and best practices taken by high-performing states, and to understand the obstacles and opportunities in low-scoring states. The goal of the analysis is to identify leading trends, share best practices, and identify technical, procedural, and policy options that can further increase the incorporation of green building strategies into affordable housing developments.

ANALYSIS APPROACH AND METHODOLOGY

As in past years, QAPs in all 50 states were analyzed and ranked on a 50-point scale. The scale is comprised of 32 subtopics, worth 45 points and distributed across four broad categories: Smart Growth, Energy Efficiency, Resource Conservation, and Health Protection. Five bonus points are available for states that demonstrate a strong commitment to robust implementation of the technical criteria, as determined by housing finance administrators.

In order to address changing technical standards, emerging trends, and changing priorities in QAPs, this year we created an optional 45-point pathway for states where the majority of projects use a third-party green building certification program as the basis for their green building standards. These programs include the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system, Enterprise Community Partners' Green Communities Initiative, or a regional green building program such as Southface Energy Institute's EarthCraft.

Topic-Based Anaylsis

For the 2012 analysis, each state's QAP and any supporting documents (e.g., appendices, building and design standards, green checklists) were examined for references to any of the 32 subtopics. The 32 subtopics intentionally represent a broader spectrum of sustainability than the "green"

measures alone, so that social, economic, and health goals inform the ranking criteria, along with more traditional measures found in green building program checklists.

The Smart Growth category comprises 10 subtopics, and includes policies that encourage development according to neighborhood planning principles articulated by Smart Growth America and the Environmental Protection Agency (EPA). The principles that apply to affordable housing developments are mixed land uses, walkable neighborhoods, utilizing existing community assets, rehabilitating historic buildings, preserving open space, and providing access to transportation choices.

The Energy Efficiency category contains seven subtopics. These include policies that encourage energy conservation by complying with above-code energy efficiency standards, specifying EnergyStar products or earning whole-building certification, prescriptively designating HVAC performance standards, and providing minimum insulation values.

The Resource Conservation category contains eight subtopics that are designed to evaluate water conservation practices and the efficient use of natural resources. Measures such as installing WaterSense fixtures, utilizing more durable building products, and sourcing building components made with recycled or renewable resources are included in this category.

The final category, Health Protection, comprises seven subtopics. These subtopics focus on strategies that protect the health of building occupants, such as ensuring adequate ventilation, conducting comprehensive environmental site assessments, or using low-emitting materials.

In addition to evaluating each of the 32 subtopics, the QAPs were surveyed for references to green building certification programs.

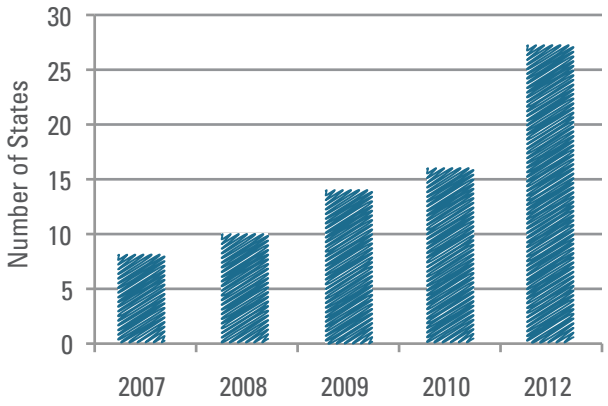
The Hollander Foundation Center, Hartford, CT, is an adaptive re-use project that transformed the upper floors of a historic office building into affordable housing. The project received LEED Gold certification in 2010. (Photo Credit: Connecticut Housing Finance Authority)

Scoring

In scoring the states, a key issue was that the number of states incentivizing third-party green building programs in the QAPs increased significantly in 2012. Twenty-seven states offered points or used language encouraging green building certification programs in their QAPS in 2012, compared to 16 in 2010 **[Figure 3]**. Further research found that in 14 of the 27 states, 60% or more of approved applications from 2011 included plans to meet the certification requirements of a third-party green building program. The increase in both the breadth of states utilizing third-party programs and the degree to which these programs are incentivized in QAPs indicate substantial progress in the direction of greening affordable housing.

This trend also required a revision to the scoring process, as the scoring system used since 2005 failed to adequately compare the efforts of states using third-party programs with those of states taking a prescriptive approach to their green building standards. In previous years, references to the 32 subtopics were used to determine each state's score and ultimate rank. Mentioning prescriptive green building criteria in the QAP or supporting documents enabled a state to achieve up to 45 points. Five bonus points were available for states attaining points in each major category, and a second five-point bonus was assigned to states that mentioned third-party programs in the QAP. States that relied primarily on third-party programs, rather than an extensive list of prescriptive measures, often scored poorly in this system.

Figure 3. Third Party Programs Mentioned In QAPs, 2007-2012



To more accurately compare varying approaches to green building, this year's scoring system was amended to use two distinct 45-point scoring paths **[Figure 4]**. The first path, ***prescriptive***, follows the approach established in previous analyses, excluding the bonuses. The second path, ***performance***, is used if 60% or more of funded applicants from the previous year (in this case, 2011) committed to build according to a third-party green building standard. States following either the prescriptive or the performance path are eligible for an additional implementation bonus of up to five points, making 50 points the highest achievable score.

When scored according to the performance path, a state automatically earns a bundle of 35 points to represent the range and quantity of green building measures that are typical of projects certified per third-party green building programs. Ten additional points are available to performance states if the QAP specifically references each of ten subtopics **[Figure 5]**. Five Smart Growth subtopics were chosen to emphasize critical land use and neighborhood planning issues that some green building programs

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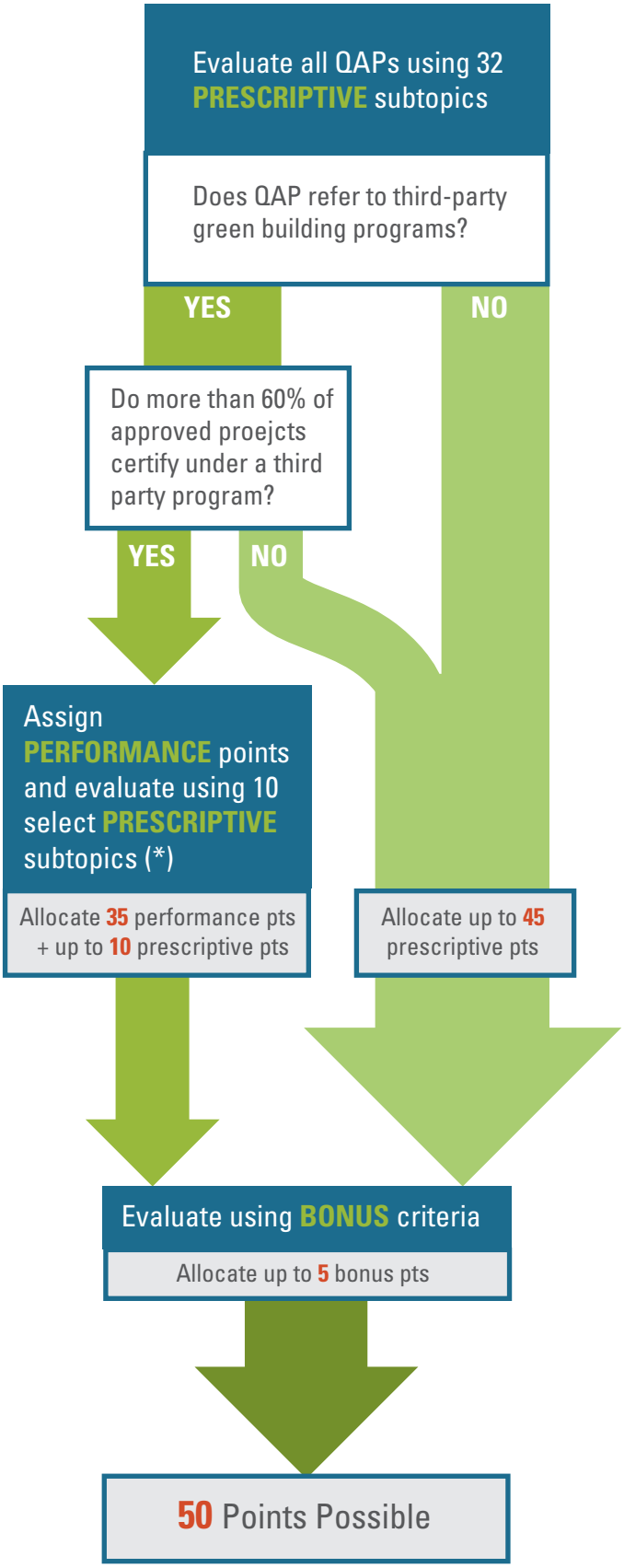
Figure 4. Performance vs. Prescriptive Determination and Scoring



PRESCRIPTIVE SUBTOPICS

Smart Growth	**10 Points Possible**	
BR*	Brownfield Redevelopment	1
UI*	Urban Infill	1
AR	Adaptive Reuse	1
PT*	Proximity to Public Transit	1
PS*	Proximity to Services	1
XH	Existing Housing Rehabilitation	1
RP*	Revitalization Plans	1
HP	Habitat Preservation	1
FP	Floodplain Preservation	1
WP	Wetland Preservation	1
Energy Efficiency	**12 Points Possible**	
PV*	Photovoltaics	1
SP	Specified Efficient Products	1
IS	Insulation Standards	1
EP	Energy Star Appliances	2
HV	HVAC Performance Heating/Ventilation (1) Cooling (1)	2
EC	Energy Codes	2
EB	Energy Star Homes	3
Resource Conservation	**12 Points Possible**	
EF	Existing Flora Preservation	1
RC*	Recycled Content Materials	1
MF	Maintenance Free / Durability	1
WC	Water Conservation Fixtures (3) Irrigation (1) Landscaping (1)	5
NM*	Renewable Materials	1
UM	Reused Materials	1
CD*	Construction & Demo. Recycling	1
SW*	Stormwater Protection	1
Health Protection	**11 Points Possible**	
HZ	Hazard Proximity	1
EA	Environmental Assessment	1
HA	Hazard Abatement Lead-Based Paint (1) Asbestos-Containing Materials (1) Radon (1) Groundwater (1) Soil (1)	5
QP	Paint (Low/No-VOC)	1
QC	Carpet (Low-VOC)	1
QF	Formaldehyde-Free	1
QV	Quality Ventilation	1

(*) PERFORMANCE SUBTOPICS

Figure 5. Performance Subtopics

Abbreviation	Category
BR	Brownfield Redevelopment
UI	Urban Infill
PT	Proximity to Transit
PS	Proximity to Services
RP	Revitalization Plans
CD	Construction Waste Management
PV	Photovoltaics
SW	Stormwater Management
RC	Recycled Content
NM	Renewable Materials

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do not fully address. Four Resource Conservation subtopics were selected because they represent best practices that are applicable to a wide range of projects, but are typically optional in third-party programs. The final subtopic, photovoltaics, is also optional in most third-party checklists, but represents an important component of a whole-building approach to energy, including the growing trend toward achieving net zero energy use.

Revised Bonus Structure

As green building measures have become more prevalent in QAPs and more states rely on third-party programs, the two five-point bonuses of previous years (for comprehensiveness and third-party programs) ceased to be useful tools for rewarding best practice. To better differentiate between the highest performing states and to recognize leading efforts in implementing green building, the 2012 analysis instituted a revised bonus structure. Up to five bonus points are available to states that demonstrate a commitment to the implementation of their state's green building criteria. The bonus elements were informed by best practices in integrated design, technical assistance, capacity building, and accountability including those articulated in Global Green's *Blueprint for Greening Affordable Housing* (2007: Island Press) and Enterprise Green Communities' *Green Affordable Housing Toolkit.*[1] Bonus points are assigned per the following criteria:

- **Third-party verification.** States that use a third-party inspector, HERS Rater, or green rater to verify the implementation of the green measures identified in a developer's application were given a bonus of two points. Compliance monitoring ensures that on-the-ground results match expectations and alerts housing finance agency (HFA) staff to feasibility issues when considering new green requirements.

- **Green building capacity within the housing finance agency.** State agencies that have a point person for green building, or a green building professional on staff, are given a bonus of two points. An in-office expert should be a resource for builders during the planning and construction process, offer insight on how to apply the green building standards, and ideally, possess hands-on green building experience.

- **Technical support and resources.** States that allocate additional resources to green building, such as offering training workshops for developers and architects, requiring a

1 http://www.practitionerresources.org/cache/documents/673/67398.pdf

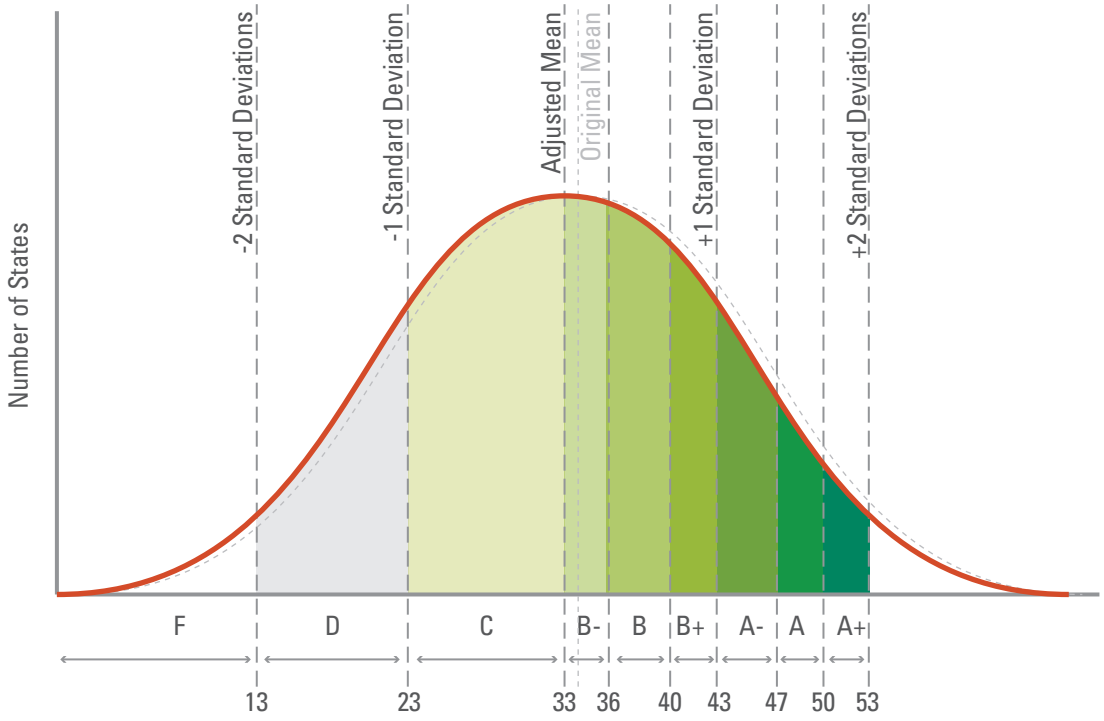
pre-construction design review meeting between development team and agency staff, or conducting studies on state-specific best practices, are given a bonus of one point. These efforts encourage developers to take a comprehensive approach to green building and demonstrate a state's investment in greening affordable housing.

All state housing agencies were invited to participate in a half-hour, semi-structured phone interview. Representatives from 34 state agencies agreed to participate. The results of the interview were used to assign points to each category of the bonus. The interview also provided an informal survey of the sustainable building practices being applied to affordable housing across differing political, economic, and environmental climates.

GRADING

This year's grading system uses the same A through F structure established during previous analyses. An adjusted bell curve was applied to the final raw scores, using standard deviation from the mean, 10 and 34, respectively **[Figure 6]**. To establish the grading tiers, the bell curve was adjusted by subtracting one point from the mean, to more accurately capture the large cluster of high-performing states. Thus, one standard deviation above the adjusted mean (33-42) demarcates the B range, and one standard deviation below the mean demarcates the C range (23-32). Two standard deviations above the mean designates the A range (43-50), and two below designates the D range (13-22). The A and B ranges were divided into thirds (B-, B, B+) to distinguish among top scoring states.

Figure 6. Grading Distribution



Each state was given an opportunity to review the preliminary grading. Individual state scorecards, the nationwide scoring table, and information on our scoring criteria were sent to a list of contacts first obtained from the National Council of State Housing Agencies (NCSHA) and updated throughout the analysis and scoring process. A one-week comment period was provided so that the states could identify any standards, design criteria, or other relevant documents that were overlooked during the assignment of scores.

ANALYSIS AND FINDINGS

Since 2005, the prescriptive component of the QAP analysis has offered 45 possible points.[2] In 2005, the average score out of 45 points was 11. Seven years later, the average score has grown to 31, a 182% increase.[3] Each year the QAPs' adoption of green building measures has grown steadily. 2012 is no exception, with this year's average of 31 representing a 20% increase from 2010's average of 26. The median, or middle value of the scores, also increased by more than 20% in the past two years, from 25 to 30.5. In 2012, 23 subtopics were mentioned in over half of the state QAPs. Nineteen of these subtopics were mentioned by more than 60% of state QAPs **[Figure 7]**.

2 While the final scores were determined using two separate scoring paths, the first step in the analysis of each state's QAP and supporting documents use the prescriptive approach. As a result, the inclusion of each subtopic in the 2012 QAPs can be compared with the findings and trends that have emerged during the past seven years of analysis.

3 New York City and D.C. were excluded from this aspect of the analysis because historical scores for these cities do not exist and including the scores would thus create a bias in the trend analysis.

As in previous years, Energy Efficiency is the most thoroughly addressed category.[4] States achieved 75% of all possible points in Energy Efficiency, up from 72% in 2010 **[Figure 2]**. Smart growth increased from 66% to 71%, while Resource Conservation remains unchanged from 2010, with just over half (51%) of all possible points achieved. Health Protection made the single greatest categorical increase from 2010 to 2012, with states achieving 8% more points this year, reaching 54% of all possible points. The three largest subtopic increases from 2010 to 2012 were:

- Hazard Abatement, mentioned in 11 more QAPs,
- Adaptive Reuse, mentioned eight more times,
- Renewable and Reused Materials, each appearing in five more.

Six subtopics were referenced by fewer QAPs in 2012 than 2010. The largest decreases in representation were:

- Recycled Content, referenced in eight fewer QAPs,
- Insulation Standards, referenced six fewer times,
- Photovoltaics, appearing three fewer times.

Smart Growth

Most subtopics within Smart Growth increased from 2010: Brownfield Redevelopment, Urban Infill, Proximity to Transit, Community Revitalization

4 This is largely due to new IRS regulations that require energy efficiency to be addressed in QAPs. See the recommendations section for further discussion.

Figure 7. Prescriptive Topics Ranked by 2012 State Participation

Category	Subtopic	Number of all HFAs in 2012	Number of Performance-Path HFA's
SMART GROWTH	Rehabilitation-Existing Housing	52	15
ENERGY EFFICIENCY	Specified Products	51	14
SMART GROWTH	Revitalization Plans	51	15
SMART GROWTH	Adaptive Reuse	49	13
ENERGY EFFICIENCY	HVAC	49	13
ENERGY EFFICIENCY	EnergyStar Products	47	14
RESOURCE CONSERVATION	Water Conservation	45	13
SMART GROWTH	Proximity to Transit	43	14
SMART GROWTH	Proximity to Services	41	12
HEALTH PROTECTION	Hazard Abatement	41	11
ENERGY EFFICIENCY	Insulation Standards	41	11
HEALTH PROTECTION	Ventilation	41	13
HEALTH PROTECTION	Environmental Assessment	40	13
ENERGY EFFICIENCY	Energy Codes	39	11
RESOURCE CONSERVATION	Maintenance Free	36	11
HEALTH PROTECTION	Low-/No-VOC Paint	33	12
SMART GROWTH	Floodplain Protection	32	6
SMART GROWTH	Urban Infill	31	9
ENERGY EFFICIENCY	Energy Star Building	31	8
HEALTH PROTECTION	Hazard Proximity	29	8
SMART GROWTH	Wetland Protection	29	8
HEALTH PROTECTION	Low-VOC Carpet	28	11
HEALTH PROTECTION	Formaldehyde-Free Flooring	26	10
ENERGY EFFICIENCY	Photovoltaics	22	7
RESOURCE CONSERVATION	Construction Waste Management Plan	21	8
SMART GROWTH	Habitat Protection	21	7
RESOURCE CONSERVATION	Stormwater Management	20	6
RESOURCE CONSERVATION	Recycled Content	19	4
RESOURCE CONSERVATION	Preserve Existing Flora	18	7
SMART GROWTH	Brownfield Development	15	4
RESOURCE CONSERVATION	Renewable Materials	14	4
RESOURCE CONSERVATION	Reused Materials	13	4

Implemented by over 60% of HFAs

Implemented by over 50% of HFAs

Plans, Habitat Protection, Floodplain Avoidance, and Wetlands Protection. The only decrease was Proximity to Services, which decreased by one state from 2010 to 2012. Rehabilitation of Existing Housing did not change from 2010, with all 50 states mentioning this in their QAPs. Both Community Revitalization Plans and Adaptive Reuse, which includes historic preservation, were mentioned in 49 QAPs. Although most subtopics increased in representation, those relating to environmentally-sound location continue to be underrepresented in QAPs, and Brownfield Development is only encouraged in 13 states. **Figure 8** shows the changes in Smart Growth subcategories from 2006-2012 in two-year increments.

Energy Efficiency

As in past years, Energy Efficiency was the most fully addressed category in our scoring analysis, with 75% of all possible points scored. EnergyStar Products and Specified Energy Efficient Products remain unchanged from 2010, while references to Energy Codes, EnergyStar building certification and Energy Efficient HVAC slightly increased. HVAC and EnergyStar Products were mentioned by almost all QAPs, and three-quarters refer to Energy Codes. Slightly more than half incentivize EnergyStar building certification, but only 20 states mentioned photovoltaics in 2012, making it the least represented subtopic in Energy Efficiency **[Figure 9]**.

Figure 8. Smart Growth, 2006-2012

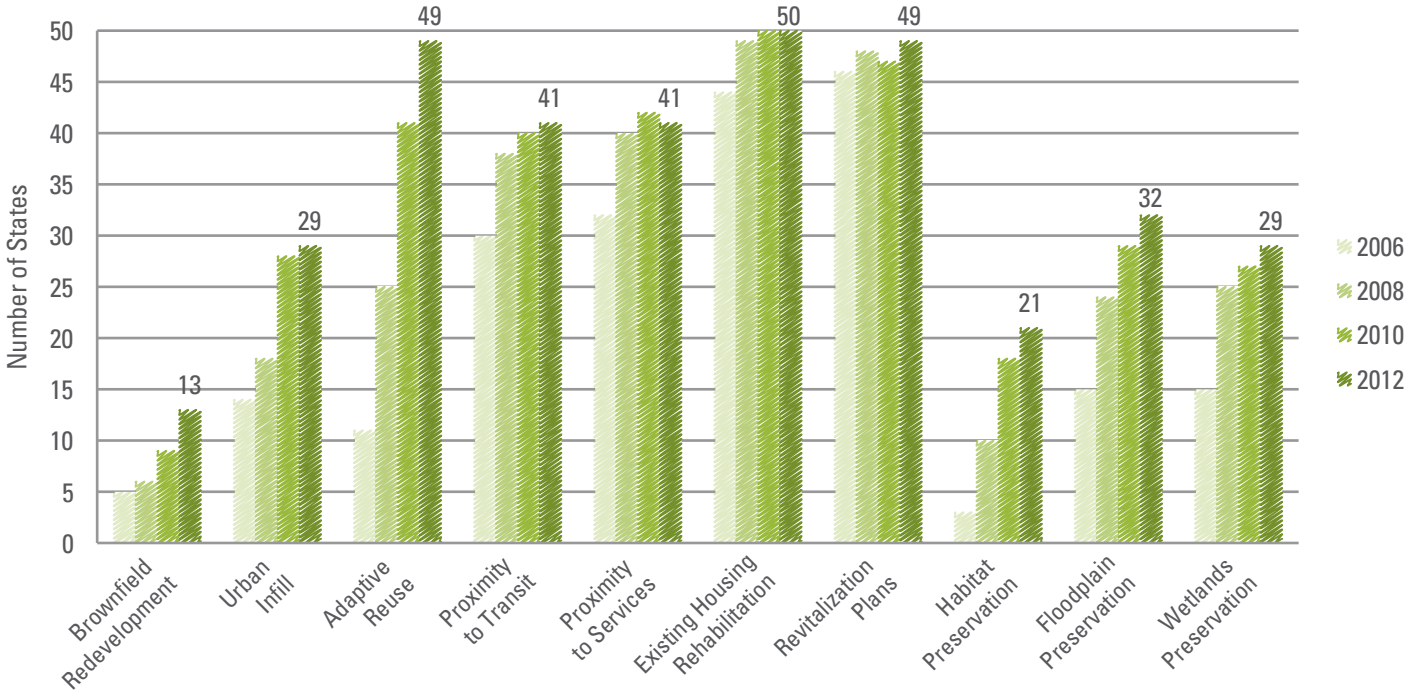
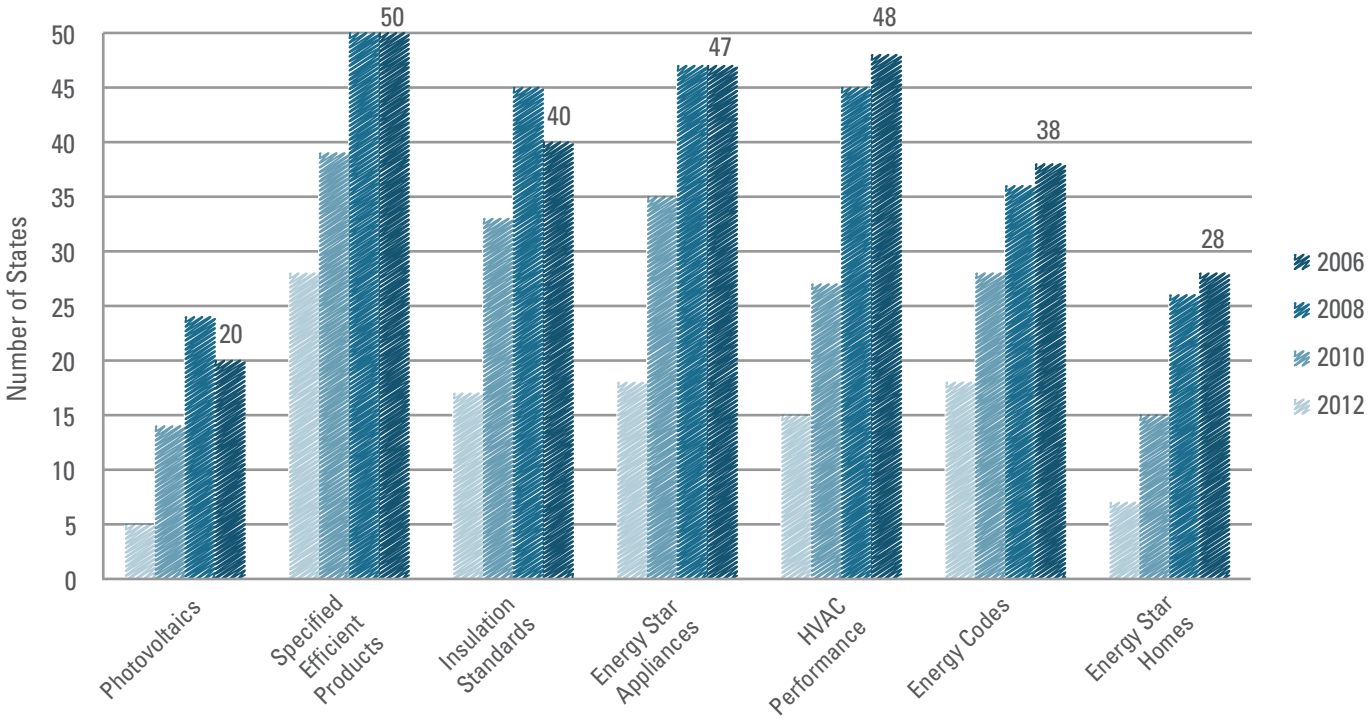


Figure 9. Energy Efficiency, 2006-2012



Resource Conservation

Resource Conservation is the least represented category in 2012, with 51% of all possible points scored by states. Although the percentage of points scored in this category did not change from 2010 to 2012, the individual subcategories' representation did change. Recycled Content, Construction Waste Management, and Stormwater Management all decreased, at least in part, because optional measures in third-party programs were not applied to individual states' scores. Meanwhile, Water Conservation standards have been adopted by 44 states, making it the most represented subcategory in Resource Conservation. This category also made the largest jump since 2006, when Water Conservation was mentioned in just 14 QAPs.

Other resource conservation subcategories increased: Preservation of Existing Flora and Maintenance Free Standards were both mentioned by two more QAPs in 2012. Renewable Materials and Reused Materials increased the most in this category with five more mentions each, but these are still the least represented subtopics in the analysis. Construction Waste Management, Existing Flora, Recycled Content, and Stormwater Management were represented in about 40% of 2012 QAPs. **Figure 10** illustrates the changes in each subcategory since 2006.

Figure 10. Resource Conservation, 2006-2012

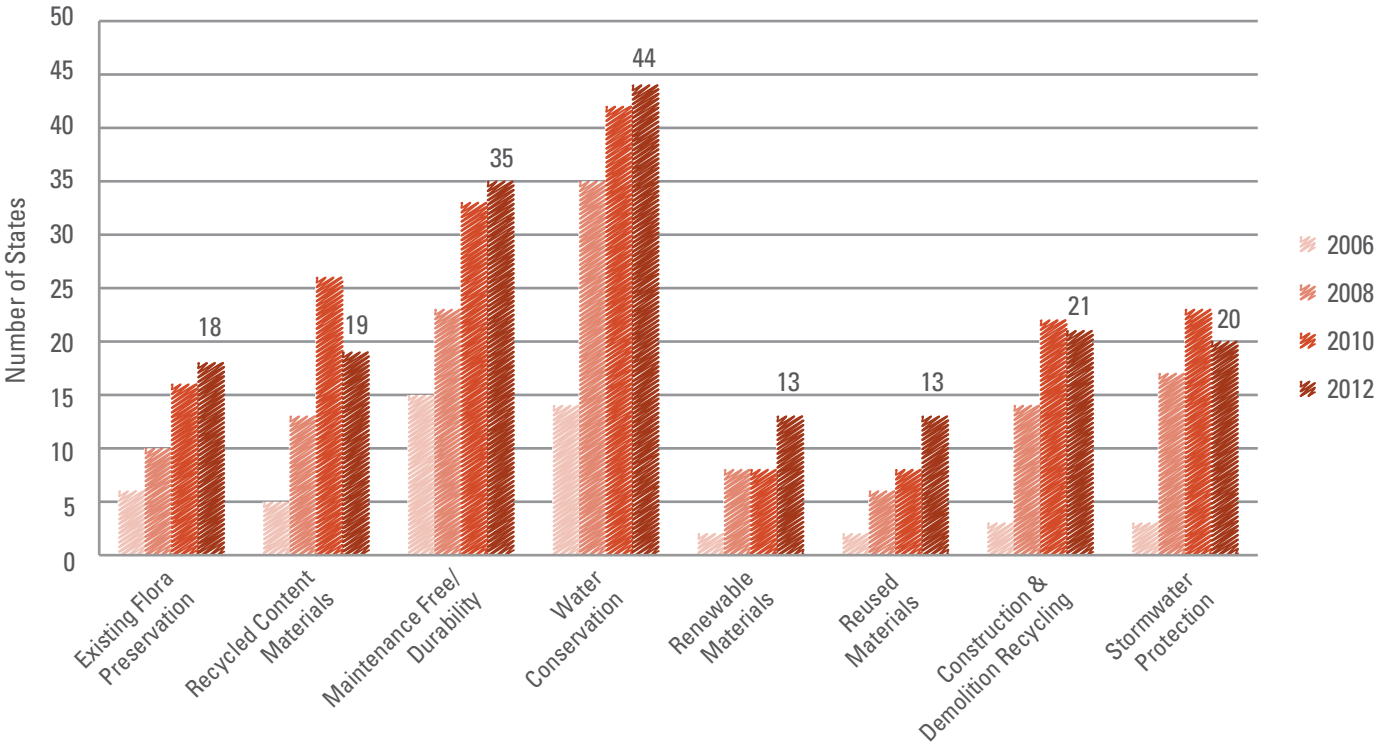
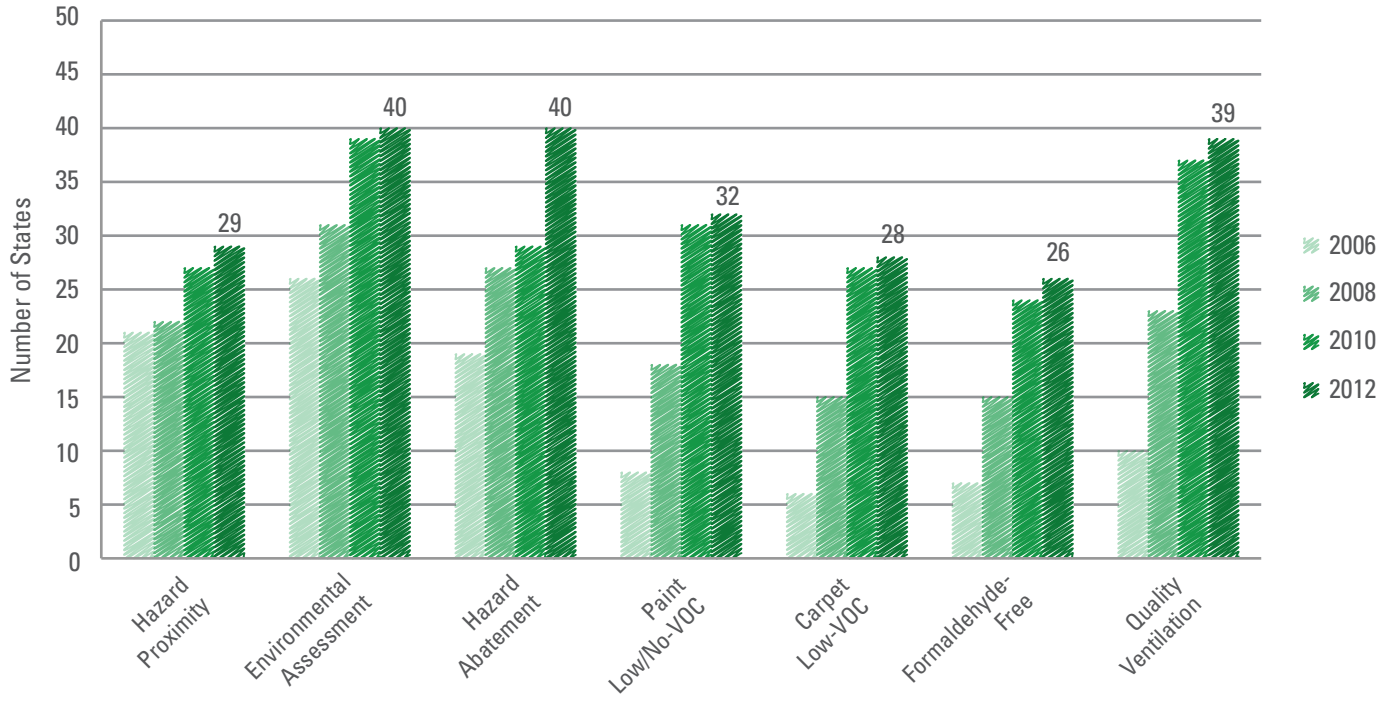


Figure 11. Health Protection, 2006-2012



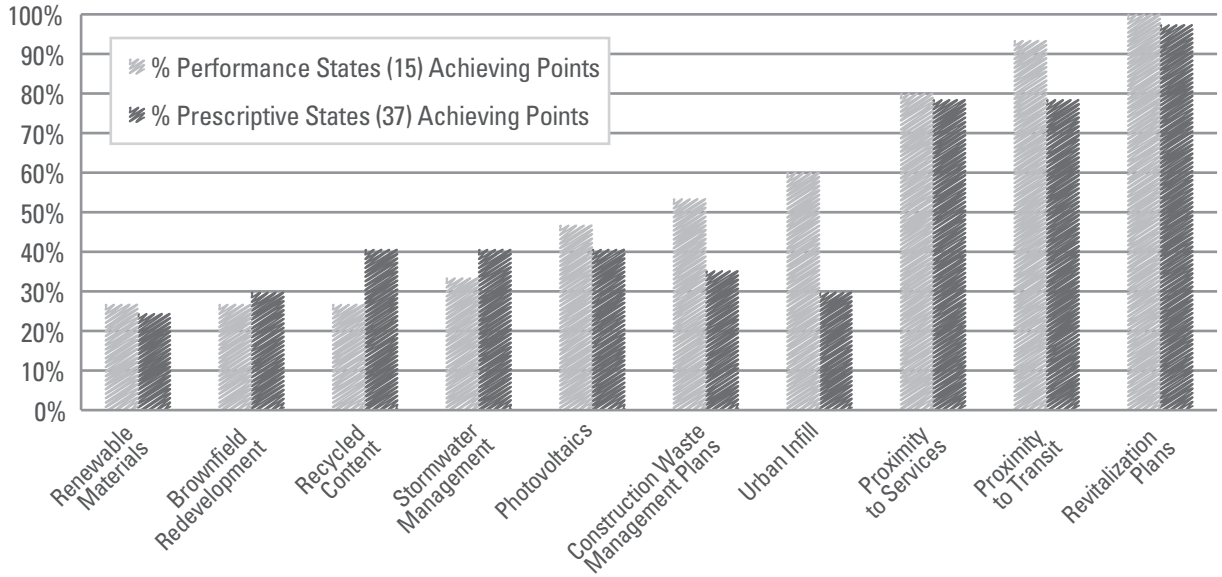
Health Protection

In 2012, Health Protection surpassed Resource Conservation in terms of overall points achieved by states, increasing from 46% to 54%. Health Protection is the only category in which each subtopic gained points since 2010 **[Figure 11]**. The largest increase was Hazard Abatement, with 11 more states mentioning testing for at least one of the following: radon, asbestos, lead, and groundwater or soil contamination. Each potential hazard is worth one point under Hazard Abatement (for a total of five points), and significantly more hazardous substances were specifically mentioned in 2012 (101) compared to 2010 (67), an increase of 51%. Just over half of states mention Formaldehyde-Free or Low-Emitting Insulation, Low-VOC Carpets, and Hazard Proximity in their QAPs, while Environmental Assessment and Ventilation appeared in 80% of this year's QAPs.

Additional Scoring – Third-Party Programs

Of the additional criteria used to rank the QAPs that follow the performance scoring, Revitalization Plans and Proximity to Transit were most frequently referenced, with 15 and 14 HFAs scoring in each, respectively. Brownfield Redevelopment, Renewable Materials, and Recycled Content were the lowest scoring categories, with four mentions each. **Figure 12** compares the scores of the performance and prescriptive state in each of the 10 subtopics.

Figure 12. Number of States Achieving Points in Each Performance Subtopic, 2012



Third Party Programs in VIRGINIA

"Since 2006, EarthCraft Virginia has worked to provide training, building science consultation, and green building certification services for builders, developers, and designers. Developed by the Southface Energy Institute specifically to meet the challenges of building in the humid southeast, the EarthCraft family of programs includes certification paths for single-family homes, multi-family developments (new and renovation), communities, and light commercial projects. These programs provide a blueprint for healthy, comfortable homes that reduce utility bills and protect the environment. Each EarthCraft project is assigned a Technical Advisor (RESNET approved Home Energy Rater) to provide boots on the ground training, third-party verification, and diagnostic testing. Through the hard work of our building industry partners, we have certified over 8,500 apartments and 1,700 single family homes in Virginia with an average energy savings of 40% in renovation projects and 30% in new construction projects."
– Philip Agee, EarthCraft Virginia Green Building Technical Manager

The Jordan, Arlington, Virginia, EarthCraft Virginia

FINAL GRADES

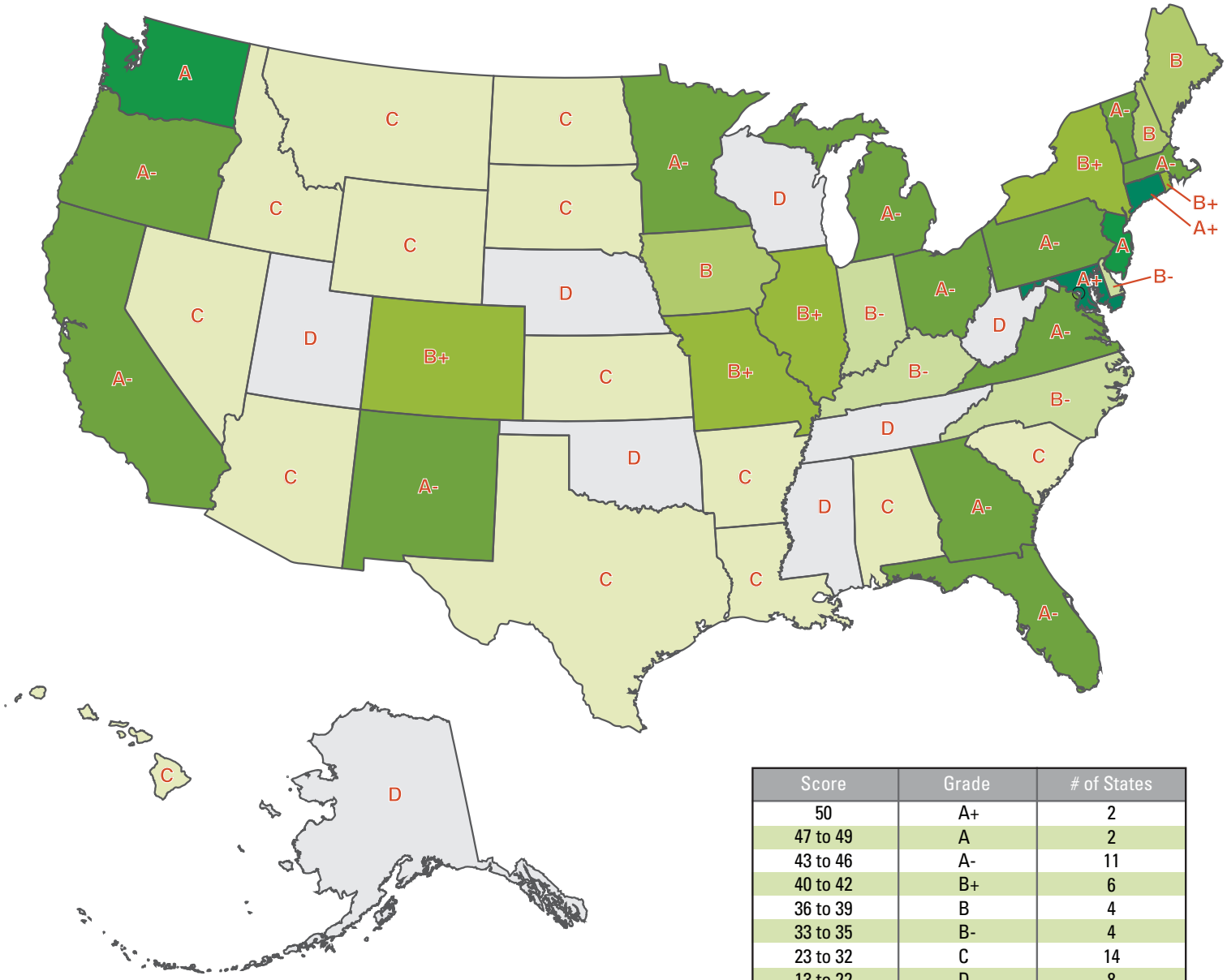
Connecticut and Maryland are the first states since the evaluation began in 2005 to get perfect scores. New Jersey and Washington received A's, and 12 more states achieved an A-. Altogether, 30% of states scored an A- or better in 2012, and 26% of states scored in the B range. 28% are in the C range, and only 16% of all states received a D in our ranking system **[Figure 13]**.

Largely due to the creation of the two scoring pathways, a number of states moved up significantly in the rankings. Virginia and Oregon both moved from a C to an A- , and Florida moved from a C to a B+ because of a new incentive for all approved new construction projects to seek third-party certification. Ohio made the single greatest leap, from a D to an A-, based on an increase of the prescriptive measures in their QAP, as well as a new requirement for funded applications to certify through the Green Communities Initiative. Other notable changes include Pennsylvania, which moved from C to A-, New Mexico, from B to A-, and Missouri, from B- to B+. With the exception of Pennsylvania, the states whose grades increased the most were scored according to the performance path.

Several states' grades did drop slightly between 2010 and 2012, primarily due to the change in the scoring approach. Previously, a bonus of up to 10 points was awarded to states that included criteria that were comprehensive or that referred to a third-party program. The 2012 bonus was changed to reflect the degree to which states are supporting the implementation of green strategies through technical assistance and access to expertise, and as a result, many states achieved fewer bonus points this year and a decrease in total score.

The largest drops took place in Louisiana and North Dakota, which both dropped from B's to C's. Louisiana's score dropped because the 2012 QAP included fewer specific references to green measures, including urban infill, stormwater management and water conservation than in previous years. Wisconsin also lost a full letter grade, dropping down to D from C. Finally, the increasing point levels achieved by more states continues to shift the curve and the grading thresholds. As a result, three states that received an A in 2010 fell in the rankings: Georgia decreased from A to A-, and both Colorado and Rhode Island went from A to B+.

Figure 13. 2012 Grades by State



Score	Grade	# of States
50	A+	2
47 to 49	A	2
43 to 46	A-	11
40 to 42	B+	6
36 to 39	B	4
33 to 35	B-	4
23 to 32	C	14
13 to 22	D	8
0 to 12	F	0

INTERVIEW QUESTIONS

For the interview component of our 2012 analysis, the following topics were covered:

History of green measures in the QAP

- How long have sustainable building measures been included in your state's QAP?
- When first including green measures in the QAP, why did your agency choose those particular measures?
- How have green building standards in the QAP changed over time?
- How much weight are green building measures given in the QAP?
- How have developers reacted to the inclusion of sustainable building measures in the QAP?
- What proportion of funded applications are rehabilitation projects?
- How do the green standards for rehabilitation projects differ from new construction?
- What are the greatest obstacles to green building your agency is facing?

Availability of technical assistance

- Does your agency or other organizations offer training for developers seeking to build green?
- Is there a green building expert in your agency?
- How accessible is green building technical assistance in your state (e.g. HERS raters, LEED-APs, regional experts)?

Compliance monitoring

- How does your agency ensure that green points claimed in the application are implemented on the ground?
- Does your agency use an independent third-party verifier for green building measures?
- Are there penalties in place if a developer fails to follow through on implementing green building measures?

Role of third-party programs

- In the case of state QAPs incentivizing third-party certification programs, why did your agency choose those third-party programs?
- What proportion of funded applicants agree to pursue third-party certification?
- Which certifications do developers most commonly pursue, and why?

Housing Finance Agency Interviews

The grading results identify which states are leading the nation in greening affordable housing and which continue to lag behind. While this snapshot is useful for Global Green USA and other green building advocates seeking to gain a general understanding of the landscape of green affordable housing, it does not reveal the various motivations and challenges experienced by housing finance agencies in their efforts to incorporate green building into the QAP. To begin addressing this knowledge gap and provide a more nuanced understanding of the issues confronting housing finance agencies, Global Green USA introduced an interview component to the 2012 analysis. The goal of the interviews was to explore the real-world constraints to implementing green building in the QAP, while being sensitive to the variety of contexts in which HFAs operate. The primary question the interviews explored was: what are the key variables that influence the incorporation of green and sustainable criteria into a state's QAP? To begin answering this, a semi-structured interview composed of open-ended questions was developed and administered to state housing finance agency members. Of the 50 states invited to participate in the interviews, 34 agreed to a half-hour phone interview, a response rate of 68%.

Grounded theory was identified as the most suitable methodology for conducting and analyzing these interviews. Grounded theory is a method of qualitative analysis that uses inductive reasoning to draw conclusions, rather than forming a hypothesis and then testing the validity of that hypothesis. By

Covey Run Apartments, Sheridan, WY, a Green Communities Certified project designed by Economides Architects, LLC.

WYOMING, an arid state known for its national parks, found that sustainable building aligned well with the state's values of water conservation and open space preservation. After evaluating several options, the Wyoming Community Development Authority began offing points in the QAP for certifying under LEED or other national standards. As a result, about half of all funded applications elected to pursue third-party certification in 2012.

continually analyzing and organizing qualitative data (e.g. interview responses), common topics and themes emerge. More in-depth questions related to those themes are then added to the original interview outline, and earlier lines of inquiry allocated less time. Interview responses were analyzed using selective coding, a technique in which the various themes are assigned a code that relates to the study's primary question. Interview responses are then coded line by line so that the relative frequency of each thematic response can be used to draw conclusions from the data. Continual refinement and reevaluation of the themes and coding process reduce the likelihood of researcher bias when drawing conclusions.

Pages 24 and 25 show eight thematic categories that emerged from the interviews, and the most frequently expressed responses related to each category **[Figures 14-21]**. The eight themes form the basis of the following discussion of on-going challenges, successes and opportunities in greening affordable housing.

INTERVIEW DISCUSSION

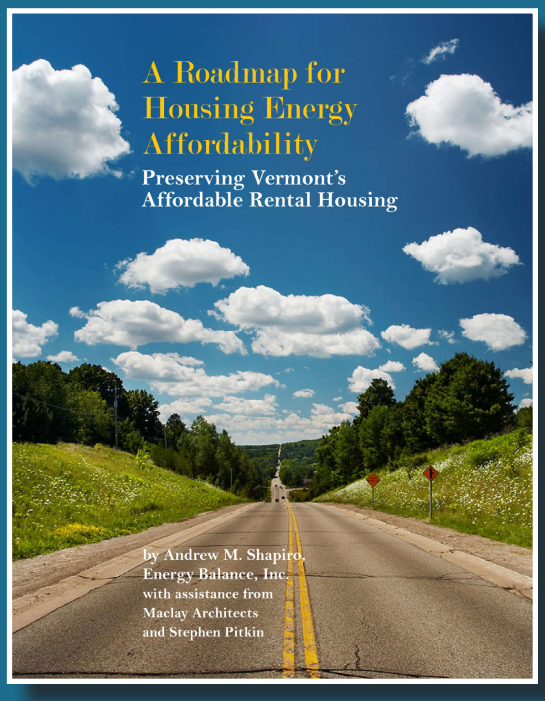
Housing Finance Agencies

The interviews revealed the extent to which various factors affect the way that HFA directors and staff include sustainability considerations in the QAP. The national trend towards green building and energy efficiency, in particular, was frequently cited by HFA members as influential. Pro-green political leadership at the state level was mentioned as a driving force by many states when discussing their initial efforts to introduce green to the QAP. Several states referenced the 2008 update to the selection criteria requirements of IRS Section 42 as the direct impetus to include energy efficiency and historic character of a proposed development as selection criteria in the QAP.

Many HFAs indicated that the efforts of other states to green their affordable housing projects, as noted in comparative studies like Global Green USA's QAP analysis or during NCSHA conferences, were influential in their decision to further incorporate green building in the QAP. At the same time, growing concerns over cost containment at the state and federal level – a strong theme that emerged quickly in the interviews – is putting pressure on housing finance agencies to choose between an emphasis on lower cost buildings or more sustainable ones.

Defining the Costs and Savings of Energy Efficient Building: VERMONT'S Effort

In 2008, energy prices soared and affected the financial feasibility of a substantial proportion of Vermont's affordable housing portfolio. In response, the VHFA and Vermont Housing & Conservation Board sought and won funding to conduct research on energy efficient building design as a means to ensure the sustainability and affordability of low-income housing in Vermont. Their efforts produced two studies – one dealing with building envelope and systems, and one specific to mechanical systems optimization. After comparing various approaches to reduce a building's energy consumption, a team comprised of VHFA and other interested parties selected the most effective strategies that were still within the technical reach of developers to include in the QAP's building and design standards. Another state organization, Efficiency Vermont, offers training on energy efficient building techniques for developers and holds discussions on in-state incentives available for energy efficient measures. The concerted effort of several agencies and stakeholders to approach green building holistically has created a standard that developers have embraced, and meets the twin goals of reducing costs and energy consumption.



Cover: *A Roadmap for Housing Energy Affordablility: Preserving Vermont's Affordable Rental Housing.* (www.vhcb.org/oadmap.pdf)

States that have fully integrated green building criteria into the minimum construction and design standards required of all state- and federally-funded projects reported experiencing fewer cost containment critiques from external sources.

In fewer cases, an individual member of the state agency was identified as a key force behind the adoption of green measures into the QAP. In these instances, an influential housing agency staff member's experience with green building, through upgrading their home's energy efficiency, participating in a green building workshop, or another pivotal experience, motivated a shift in the QAP towards greener building standards.

Developer Community

A majority of housing finance agency members discussed the influence of the affordable housing developer community on decisions regarding what green measures to include in the QAP. Many staff members discussed past efforts to introduce green building measures in the QAP and having met fierce opposition from developers on the cost or practicality of implementing those standards. To mitigate the risk of opposition, HFAs discussed using a consensus-based approach to develop a QAP's green requirements over time. Many HFAs host an annual forum dedicated to reviewing their QAP regulations, at which time the housing agency can get input from developers and architects on the challenges of the previous year's requirements, as well as discuss the feasibility of proposed changes. Good communication with builders and architects was repeatedly referenced as a key component

This year Connecticut hosted a two-day seminar on EPA EnergyStar Programs for Multifamily Developments.

Each year CONNECTICUT hosts a conference to help building professionals keep up with changing trends in the field. The 2012 seminar, focused on EnergyStar Homes and Multifamily High Rise qualification programs. Multifamily developers, development consultants, architects, engineers, contractors, and certified energy assessors discussed the new EnergyStar standards, and reviewed the 2012 CHFA energy conservation requirements.

influencing the successful inclusion of more sustainable building measures in the QAP.

Because of the learning curve associated with some green building techniques, many states discussed the importance of adding green building requirements incrementally. A number of HFAs initially introduced green measures as recommendations or optional scoring criteria, and, as developers became familiar, made those measures requirements. By first introducing changes that were easy and cost-effective to implement, agencies found developers were more willing to incorporate advanced green features in future projects. Additionally, many states reported that developer pushback regarding higher first costs diminished after buildings designed according to stricter efficiency and quality standards were in operation for a few years, and developers were able to realize cost savings firsthand.

In some states, growing market interest in green building led developers to seek green building expertise of their own accord. In states where a market interest in green building was less prevalent, some HFAs found it necessary to provide training for developers on green building techniques. Partnerships with national, regional, or state green building organizations to provide training were seen as useful for HFAs seeking to keep developers in step with changing green building technologies, and to continually foster the implementation of more cost effective building practices.

Conceptualizing Costs and Benefits

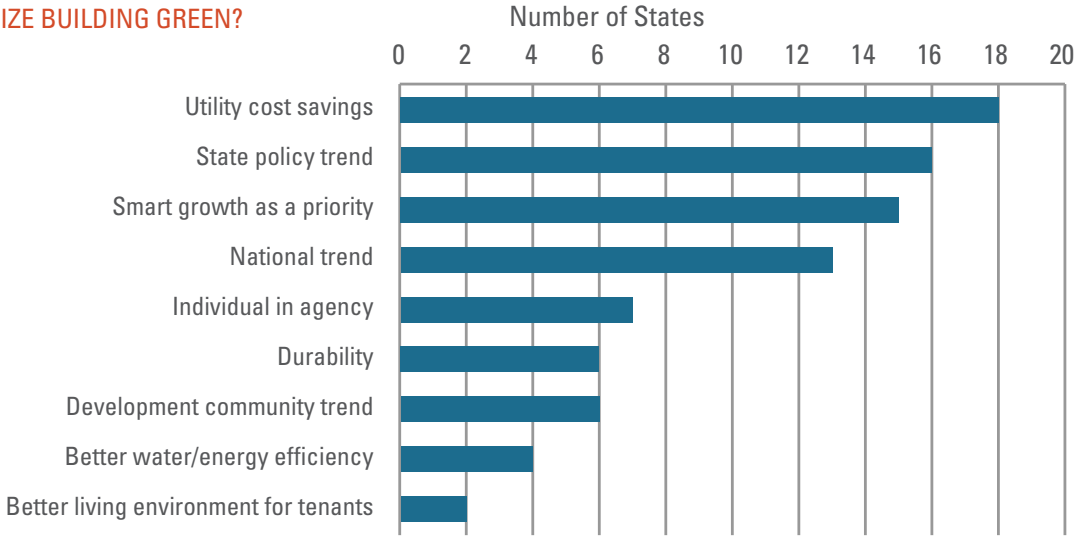
How housing finance agency members perceive the relative costs and benefits of green building strongly influences the degree to which green building criteria are incorporated in their QAPs. Utility savings was the most commonly referenced benefit of building green. A majority of the state agency members recognized that utility costs are a significant component of a proposed development's long-term affordability for low-income tenants. One HFA member indicated that they had witnessed a 30-50% reduction in average utility costs by building according to a third-party green standard. Two agency members discussed building energy efficient homes as a way to prepare for increasing fuel costs over the coming decades.

Proximity to transit and services emerged as critical components of many HFAs' sustainable development efforts. During interviews, many agency members asserted that affordable housing tenants are better served by being close to amenities or transit options. HFAs that include transportation

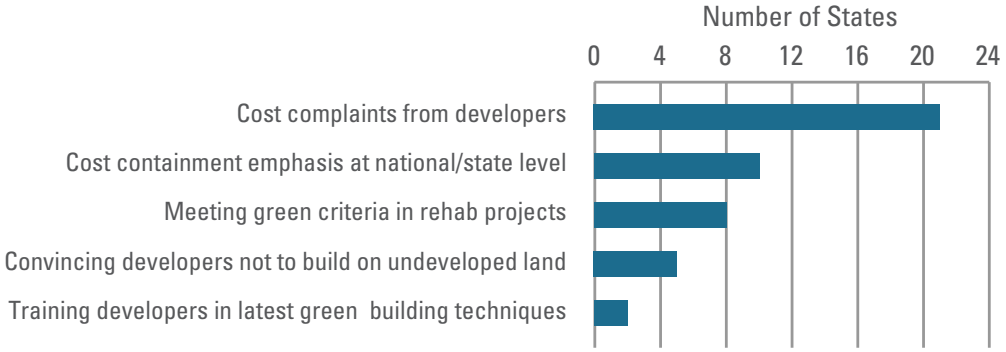
(continued on page 26)

Figures 14-22. Interview Results

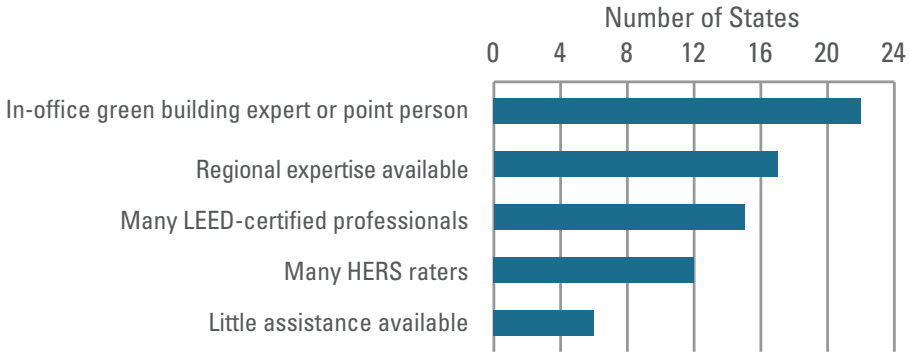
WHY EMPHASIZE BUILDING GREEN?



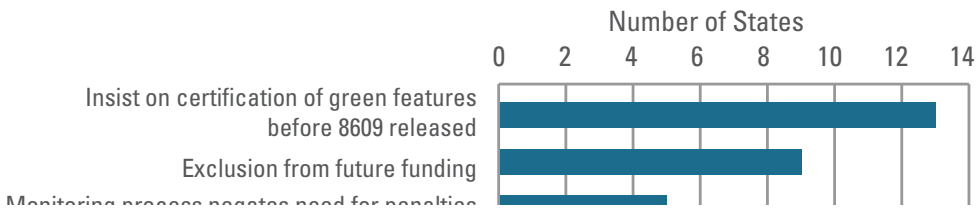
OBSTACLES IN REQUIRING GREEN BUILDING



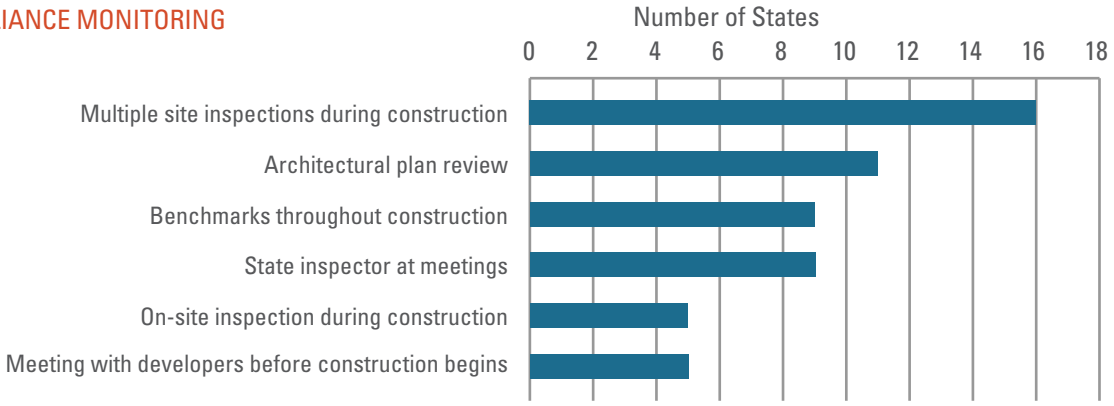
TECHNICAL EXPERTISE AVAILABLE IN STATE



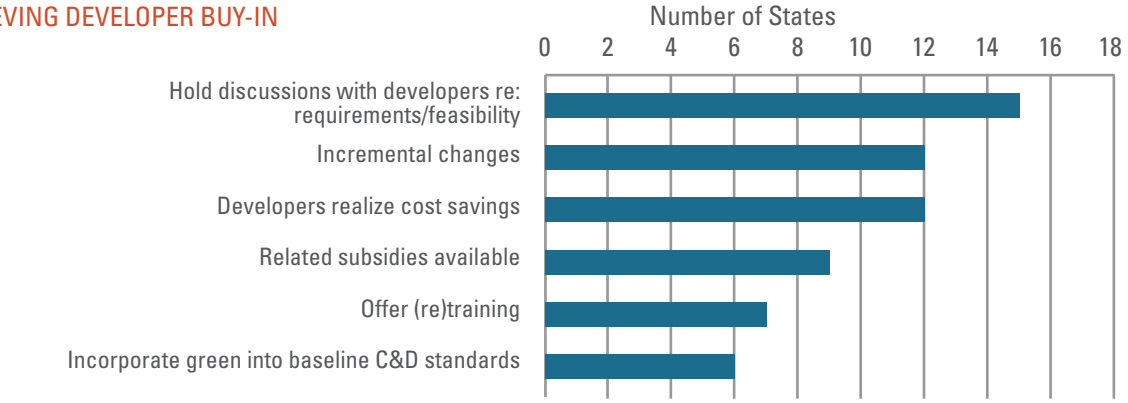
PENALTY ASSESSMENT



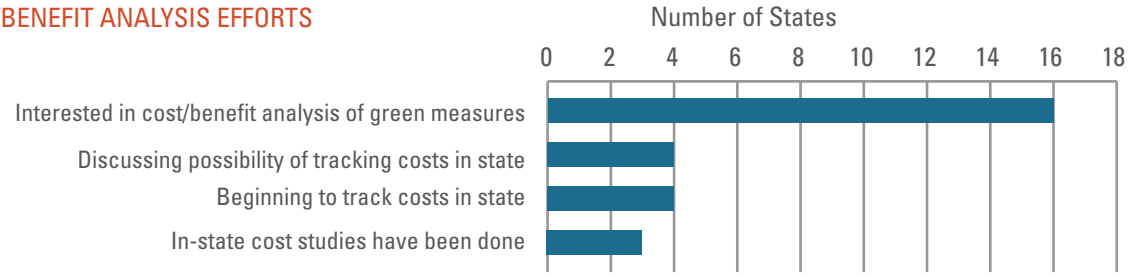
COMPLIANCE MONITORING



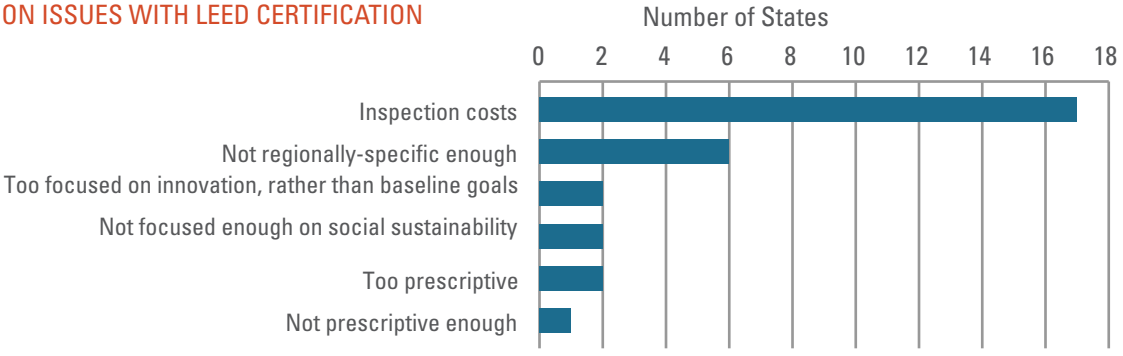
ACHIEVING DEVELOPER BUY-IN



COST/BENEFIT ANALYSIS EFFORTS



COMMON ISSUES WITH LEED CERTIFICATION



Incremental Changes
COLORADO'S Case

2008: CHFA decided to take steps towards incorporating Enterprise Green Communities criteria into the QAP. A cross-section of affordable housing stakeholders is organized to choose items from the Enterprise Green Checklist for the QAP that are easy and inexpensive to implement.
2009: The QAP requires EnergyStar appliances for the first time.
2010-2012: After positive feedback from the previous year, CHFA includes in the QAP a requirement for all developers to meet Enterprise Green Communities mandatory standards and fill out the Green Checklist. Developers must meet the requirements for 30 points from the checklist, but are not required to certify through Enterprise. To ensure 100% participation, CHFA works directly with Enterprise to grant waivers and offer technical assistance to developers.

Raising the Standard
MAINE'S New Quality Standards and Procedures Manual

For 2013, MaineHousing is moving from two separate documents – a Design & Construction Manual and a specialized Green Building Standards Manual – to a single Quality Standards and Procedures Manual that incorporates green building into the state's baseline construction standards. The agency's stance on Energy Conservation can be found on page 1 of the new manual:
"MaineHousing recognizes that energy conservation is one of the best ways to manage operating costs and that controlling operating costs is the best way to ensure long-term solvency of affordable residential developments that typically generate limited additional operating surpluses. Therefore, all new and renovated residential projects financed by MaineHousing shall be constructed to the following energy conservation standards and requirements."

(continued from page 23)

costs in the definition of a development's affordability are more likely to incorporate smart growth criteria into the QAP, and at least two states are considering the use of LEED for Neighborhood Development in future QAPs to address smart growth goals.

HFA members' exposure to smart growth concepts varied significantly from state to state. In Michigan, the HFA staff is working to incorporate language that encourages progressive approaches like transit-based community planning in the QAP, while in other states, the HFA staff interviewed were unfamiliar with smart growth terminology and concepts. Beyond transportation costs, some agency members view affordable housing as a means to encourage community building and economic revitalization in depressed areas, and are considering ways to prioritize these considerations in the QAP.

Several HFA members articulated the belief that green building means lower operating costs, lower maintenance costs, and a more durable product. State HFAs that consider operating costs and building durability when evaluating a project's affordability are more likely to create a QAP that does not penalize a proposed development for the higher capital costs entailed by green building. Many states viewed a green building as long-term investment, and several found that a green building is more marketable. Two described green buildings as a "better product," and one HFA member said that developers were reporting more satisfied tenants and less tenant turnover since incorporating green features into their projects. States in which the HFA is less attuned to durability or long-term operating cost considerations more frequently

have a QAP that values a less costly building over one built using more durable or energy efficient materials entailing greater capital costs.

The green building benefits least mentioned by state HFA members were those relating to health and environmental protection measures. Although a small number of HFA members interviewed articulated that green building conferred health benefits to tenants, very few states viewed the benefits of resource-conserving practices as exceeding the added costs of implementation. The absence of an accepted framework to quantify health and broad environmental benefits is reflected in the relative underrepresentation of these measures in QAPs. Many interviewees indicated they would be interested in studies that more thoroughly evaluate tenant health in green buildings.

A large number of state agency members mentioned interest in using cost/benefit analyses to evaluate particular green measures in their state. Some agencies remain unconvinced that green measures are worth incorporating into building standards from a cost-efficiency perspective, and would like to see more studies evaluating cost savings claims. Enterprise Green Communities has produced a number of reports on the health, economic, and environmental benefits of affordable housing built according to the Green Communities Initiative criteria. Most recently, they issued a 2012 update to their "Incremental Cost, Measurable Savings" report that compared the utility cost savings over the lifetime of 52 affordable housing projects to the cost of implementing their green criteria (see page 32 for a full discussion of this report).[5]

5 http://www.enterprisecommunity.com/solutions-and-innovation/enterprise-green-communities/resources/research-and-evaluation.

To address the demand for additional information on the level of benefits provided by green projects, a number of states are engaged in state-level data collection and evaluation. Three states – New Jersey, Vermont, and Washington – have conducted state-specific studies on green building practices, four more are beginning to track utility costs of affordable housing developments, and another four are considering doing the same. Many interviewees indicated that demonstrating the cost savings that can be realized through green building is an important tool in responding to cost containment critiques. However, the vast majority of existing research on green building costs and benefits, whether conducted by state agencies or green building organizations, focuses only on the easily quantified utility costs and savings. The need for quantification of the other benefits of green building remains largely unaddressed.

Compliance Monitoring

Compliance monitoring efforts differed greatly from state to state. State HFAs that strongly value the benefits of green building were more likely to develop a set of stringent protocols to monitor a developer's adherence to green building requirements, as compared to those states that placed a lesser value on green building benefits.

Many states have penalties in place for non-compliant developers. Several HFAs require evidence of third-party green building certification before issuing the IRS 8609 form that certifies the developers' eligibility to receive the tax credits that were allocated to the project. Without IRS Form 8609,

a developer cannot claim the tax credits. In some states, failure to follow through on the green measures committed to in the QAP application can result in a developer being excluded from future funding. Other penalties exist in the case of non-compliance, such as a reduction in the amount of tax credits allocated to a development project or a reduced developer fee, but several states indicated that they had never been forced to assess penalties for non-compliance with green building measures. If an agency relies on self-certification of green measures and is disconnected from much of the construction process, the likelihood of discovering compliance issues among developers decreases, and establishing penalties for non-compliance has limited impact. Of the 34 states interviewed, 26 require third-party verification for some or all green measures. Six rely solely on self-certification by the project architect.

A comprehensive monitoring process was found to negate a need for penalties in a number of states, and several state HFA members discussed ongoing monitoring as crucial in maintaining compliance. Unexpected challenges or feasibility problems occur often in construction and it is not always possible for developers to follow through on every green building component included in the application. Interviewees from HFAs with rigorous compliance monitoring standards explained that recurring site visits by a qualified state staff member can alert the agency to potential design changes required in construction process, and allow for a quick response that is satisfactory to both the housing agency and development team. Several HFA members indicated that having an in-house green expert was helpful in quickly and efficiently solving problems that arise during the construction process or to pursue unanticipated opportunities to further enhance a project's sustainability.

Many states utilize a design review process to ensure that developers are capable of and planning to incorporate green features cited in their applications. Five states mentioned a pre-construction meeting with developers to discuss the HFA's expectations for the project. Sixteen states mentioned that an HFA inspector visits the site multiple times during construction, while five said there was only one site visit during construction. Nine states set specific benchmarks developers must meet throughout construction, and often rely on paperwork certified by the site architect to demonstrate compliance at each benchmark.

Figure 22. Use of Independent Third Party Verifier

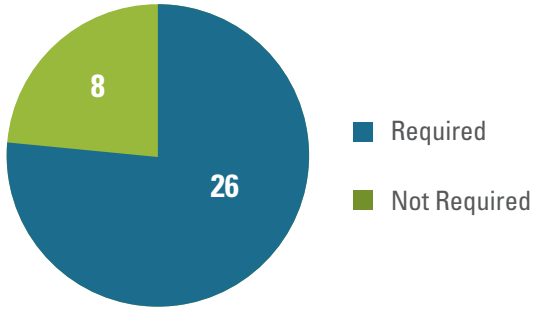
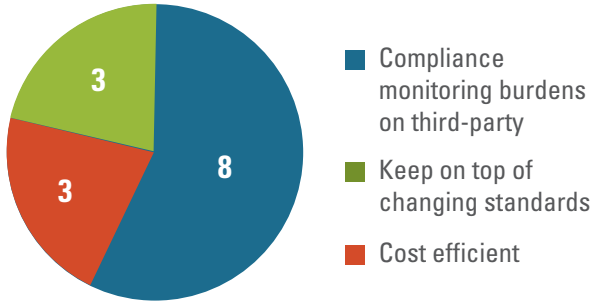


Figure 23. Why Third Party Verification?



Relatively few HFAs are able to take such a hands-on approach with every project that receives funding. Several states discussed using third-party certification programs to remove the burden of green building compliance monitoring from the agency's duties **[Figure 22]**. Use of third-party programs was also cited as helpful in keeping up with changing trends and new technologies in green building. A handful of the HFA members that participated in the interviews indicated that using a third-party green building standard was the most cost-effective choice to ensure that green building outcomes matched the HFA's expectations. Arizona, for example, conducted a working group to evaluate different green building strategies and found that offering points for LEED certification in the QAP would be more cost-efficient than creating a state-specific green building standard and comprehensive monitoring process **[Figure 23]**.

On the other end of the spectrum, many state agency members believe that third-party programs, particularly LEED, are too costly to require, or even encourage, participation in. The perception is that the expenses incurred by the inspections and consultants LEED certification requires add too much to a project's soft costs. Several states mentioned that they prefer a regionally-based green building approach. Other arguments against incentivizing LEED certification in the QAP include a belief that LEED focuses too heavily on innovative green measures as opposed to more fundamental concerns, and that social sustainability criteria are missing from LEED checklists. Despite not awarding points for LEED certification in the QAP, several interviewees were aware of past projects in their state that had sought and achieved LEED certification for marketability purposes.

Making the Case for Rehabilitation in MINNESOTA

Since 2008, the Minnesota Housing Finance Agency has used the 2008 Enterprise Green Communities Criteria with a Minnesota-specific overlay to oversee the state's green building standards. In May of 2011, following Enterprise's introduction of a new set of Green Communities criteria, the MHFA met to discuss a Minnesota overlay for the 2011 criteria.

During the meetings and discussions regarding the overlay, the HFA realized that Minnesota is unique in the number of moderate rehabilitation projects it funds. Moderate rehab projects typically do not include substantial mechanical or building envelope improvements. Dave Epley, a discussion participant from Enterprise Green Communities, concluded that the chances of moderate rehab projects in Minnesota meeting Enterprise certification requirements were poor due to their limited scope of work.

Through a comprehensive, consensus-based process that included advice from energy raters, design engineers, funding partners, and HFA staff, the HFA created an overlay specific to moderate rehabilitation projects that meets the intent of Enterprise's green criteria, while also being sensitive to a project's limited scope of work.

After meeting numerous times to draft and revise the Minnesota overlay documents, a published document was released in April 2012. This coincided with the annual Consolidated Request for Proposals process, which includes LIHTC allocation requests. As a result, Minnesota has one of the country's strongest green rehabilitation programs in affordable housing.

Viking Terrace, Worthington, MN, I&S Group

Rehabilitation Projects

An ongoing obstacle for state HFAs seeking to develop a comprehensive green building program is the lack of a national or regional standard for rehabilitation projects. Many states mentioned that meeting green criteria in rehab projects, particularly for moderate rehab or mid-rise projects, is challenging, as the demands of each project differ significantly on a case-by-case basis. There are few third-party standards specific to rehab, and many states that primarily rely on third party certification programs are dissatisfied with the options available. Many HFA staff also expressed the perception that third party standards are often unrealistic or not applicable to many aspects of rehabilitating a property. In Minnesota, state agency architects worked closely with Enterprise Community Partners' staff to develop an overlay to the Green Communities Initiative checklist specific to moderate rehab. Vermont chooses to emphasize gut rehabs in their QAP ranking process to avoid issues related to moderate rehab. There continues to be little consensus among affordable housing stakeholders on how to most effectively incorporate green building measures into rehabilitation projects. Furthermore, many states have found it difficult to balance historic preservation and energy efficiency priorities in a cost efficient manner, which is an ongoing concern as addressing the historic nature of a project is a required selection criterion according to Section 42(m) of the Internal Revenue Code of 1986. Section 42(m) delineates the responsibilities of housing credit agencies in allocating low-income housing tax credits to developers.

RECOMMENDATIONS

Green building in the Low Income Housing Tax Credit program has clearly reached a critical mass across the nation, with 47% of total LIHTC funds nationwide going to states that achieved an A- or better in our 2012 ranking and 72% of states receiving a B- or better. This achievement has largely been the result of individual state-by-state initiatives rather than comprehensive federal action. This shows a national awareness of the benefits of green buildings to low-income housing development, as well as willingness on the part of individual states to take the initiative on identifying how to best implement green practices in the projects they fund.

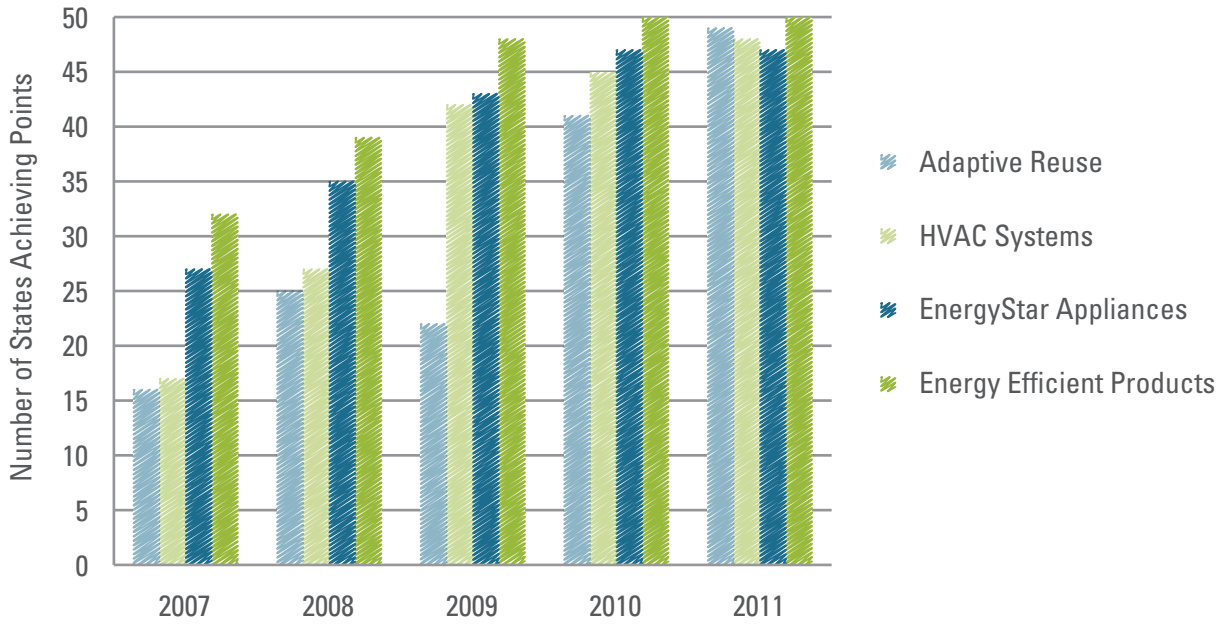
At the same time, there remain a number of states that continue to achieve subpar scores in our evaluation, which demonstrates that work remains to be done in ensuring that all housing built with public subsidy offers the economic, health, and environmental benefits provided by green building and sustainable development practices. To build upon the gains to date and capitalize on future opportunities to expand the scope, rigor, and implementation of green measures in QAPs and in low-income housing broadly, Global Green offers the following recommendations to state and federal policymakers, affordable housing stakeholders, and the green building community.

1. Update IRS Section 42 to require that QAPs include health criteria and water conservation.

The passage of the Housing and Economic Recovery Act (HERA) in 2008 made energy efficiency a mandatory selection criteria that each state had to include in its QAP. As a result, Energy Efficiency became the most fully addressed category in the 2009 QAP Analysis, and continues to be the most addressed category in 2012. From 2007 to 2012, the percent of all possible points achieved in the Energy Efficiency category increased from 31% to 75%, the single greatest increase of all four categories. This year, every state received a point for Specified Energy Efficient Products, and nearly all states mentioned EnergyStar Appliances and Energy Efficient HVAC Systems in their QAPs. Similarly, HERA also introduced a requirement to include the historic character of a project in QAP selection criteria. In 2010, we adjusted our Adaptive Reuse subtopic to include historic preservation, and as a result our scoring saw a spike in that subtopic **[Figure 24]**. The subtopics affected by HERA are now the most addressed in our scoring analysis.

While there remains significant potential for individual states to further encourage adoption of green building features, the example of HERA demonstrates the utility of federal policy in raising baseline standards. Updating IRS Section 42(m)(1)(C) requirements can also address concerns about states decreasing the stringency of their green building requirements in light of changing political leadership, staff interest, or pressure from various stakeholders concerned only with short-term cost containment. By broadly defining the topic areas that each QAP must address, this type of regulatory action still allows states great

Figure 24. Increase in Select Subtopics Following HERA, 2007-2012



Incremental Cost, Measurable **SAVINGS**

The Enterprise Community Partners study found that the average project accrued a lifetime utility cost savings of $3,709 per dwelling unit, while the incremental cost per dwelling unit for the average project to comply with the Green Communities Criteria was $3,546, a savings of $163. The lifetime savings was based on conservative estimates of the life of building elements, using a typical life of 20 years before replacement or renewal. In practice, since many of Enterprise's design criteria are passive in nature (e.g. improved insulation and better building solar orientation), the economic life of these elements will greatly exceed 20 years, appreciably increasing the actual lifetime savings.

Enterprise Green Communities. "Incremental Cost, Measurable Savings," 2011.

CONCLUSIONS from Vermont's "A Roadmap for Housing Energy Affordability."

1. Policy makers should put aside simple pay-back analysis in determining appropriate levels of energy efficiency investment in favor of a longer-term view of the sustainability of multi-family housing.
2. Program modeling should assume little or no growth in resident income, developing energy efficiency investment protocols which are at a minimum able to maintain affordable operating costs through 2025.
3. More robust investment today will lower carbon emissions and energy consumption, increase resident comfort, and fortify and sustain the broad public investment in affordable rental housing long into the future.
4. Affordable housing providers, developers and funders should work together to identify and address barriers to increasing the level of energy efficiency in housing rehabilitation and new construction.
5. Based on the findings of this report and other current research, affordable housing providers, developer and funders should develop protocols that address the level of investment required today and that evolve over time to reflect new findings in order to maximize investment in support of long-term sustainability goals.

A Roadmap for Housing Energy Affordablility: Preserving Vermont's Affordable Rental Housing. (www.vhcb.org/oadmap.pdf)

latitude in arriving at locally-acceptable ways of meeting the requirements without going through the lengthy and politically-fraught process of federal standard setting.

The analysis of the 2012 QAPs shows that a majority of states have not adopted criteria that reduce tenant exposure to environmental toxins. These measures, such as low-VOC building materials, hazard avoidance, and ventilation standards are easy to implement and add little to no extra cost. For example, although there is no added cost to use formaldehyde-free insulation, only 26 states mention this standard. Only 28 states mention low-VOC carpets, and 32 mention low-VOC paints and adhesives. Protecting tenant health provides so many individual and societal benefits at little-to-no added cost that these types of measures are appropriate to include in IRS Code 42(m)(1)(C).

Similarly, water conserving plumbing fixtures are widely available at no extra cost, particularly with the broad adoption of the WaterSense federal standards by large product manufacturers. Yet there is little or no mention of water conservation in nearly 20% of state QAPs. Given its impact on long-term operating costs and increasing supply vulnerability due to global warming, water also needs to be addressed at the federal level through the IRS code. *We recommend that IRS Section 42(m)(1)(C) be amended to address health and environmental impacts in addition to energy efficiency.*

The Norris Apartments features a small pocket park in the center courtyard that provides green space to residents while limiting rainwater runoff into the city sewer system.

In Philadelphia, **PENNSYLVANIA**, the water department has created an incentive program for stormwater management. Rather than heavily investing in a new citywide system, the city offers grants to new non-residential construction projects that utilize innovative green stormwater management measures. The grants are determined by the amount of savings conferred to the city by avoiding the costs of treating excess stormwater. Developers are able to both build green and maintain profitability.

2. Use established tools and metrics to define smart growth and sustainable neighborhood QAP criteria.

The majority of states encourage some aspect of smart growth development through language in their QAPs; 80% mention proximity to services and transit as selection criteria, more than half reference urban infill (the reuse of underutilized buildings or sites within a built-up area) and a quarter encourage brownfield redevelopment. While there is growing consensus on the need to prioritize smart growth planning to best serve affordable housing tenants, there is significant variation in how those concepts are reflected in the QAPs. Many states offer points for each amenity or transit option located within a certain distance from a proposed development's center, while a small number include Walk Score as a proxy measure for smart growth development. Some QAPs reference various aspects of smart growth in narrative form, but do not offer any specific metrics to measure a proposed development's adherence to those principles.

One emerging approach is to include both housing and transportation costs when determining affordability. Center for Neighborhood Technology has developed a housing and transportation affordability index to address this issue. Federal policy is beginning to recognize that location and transit access have a significant influence on overall affordability, as shown in this excerpt from the U.S. Department of Housing and Urban Development's (HUD) 2013 Notice of Funding Availability (NOFA) Policy Requirements:

> "(b) Combined Housing and Transportation Cost Burden. Prioritize the reduction of the proportion of residents in the affected project area or development who will face a combined housing and transportation cost burden of 45 percent of their average household income. Estimate the proportion of residents of the affected project area or development currently facing this cost burden (based on a calculator such as the Center for Neighborhood Technology's calculator located at http://htaindex.cnt.org/) and estimate the proportion of residents who will have their cost burden reduced below 45 percent as a result of actions undertaken by the grantee."[6]

Another approach for evaluating smart growth measures is GreenTrip's certification program, which creates incentives for developers to use comprehensive strategies to reduce vehicle dependence for future residents, such as car sharing programs,

6 Notice of HUD's Fiscal Year (FY) 2013 Notice of Funding Availability (NOFA) Policy Requirements and General Section to HUD's FY2013 NOFAs for Discretionary Programs: Appendix B.2.i.6.b.

free or discounted bus passes, and reduced parking. Currently available in California's San Francisco Bay Area, GreenTrip certification is a model for encouraging the types of design features and operation practices that can decrease vehicle miles traveled and car dependence for affordable housing tenants. *We recommend that states use the Housing and Transportation Affordability index as a scoring criteria in QAPs and apply tools like Walk Score, Transit Score, or criteria based on the GreenTrip certification to identify preferred locations for acquisitions or future developments.*

To derive the greatest benefit from public investments in low-income housing, smart locations need to be combined with good neighborhood planning. The LEED for Neighborhood Development and EarthCraft Communities certification systems were developed to address the challenge of quantifying sustainable development at a larger neighborhood scale, and contain measures that evaluate smart growth, walkable urban design, green infrastructure, and building efficiency. Several states that currently rely on third party programs are considering incorporating these neighborhood scale criteria into future QAPs. HUD's FY2013 NOFA guidelines also refer to LEED-ND and similar neighborhood sustainability standards in its policy priorities. *We recommend that states encourage developers to apply LEED-ND standards to developments that are approximately 5 acres or larger.*

3. Standardize the assessment process and energy performance expectations for rehab.

This year's analysis and interviews indicated that there is not yet a consensus about the best way to approach greening rehab projects in a QAP. However, developing some commonality of approach to rehab is crucial in an era when many original tax credit properties have their affordability restrictions expiring and when rehab is being looked to as a lower-cost alternative than new construction for increasing the supply of affordable housing.

Because each rehab project is different, Global Green USA does not believe that a one-size-fits-all standard can be relied upon by HFAs in the same way that they have increasingly used third-party green building programs for new construction. However, we do believe that an assessment process to determine what is needed in a rehab can be standardized and that using such an assessment process could lead to better green building outcomes. HUD, the Federal Housing Agency, and Fannie Mae, have developed protocols for a Green Physical Needs Assessment and Energy Audits as part of their Green Refinance Plus Program. State HFAs should begin to use these national protocols as a way to bring some clarity to the capital needs assessment process followed by developers wishing to propose rehab projects for tax credits.

Once there is a standardized assessment and benchmarking process in place at the state QAP level, HFAs can then move to a performance standard for rehab projects in the areas of energy consumption, water efficiency, and ventilation,

combined with prescriptive requirements for low emitting and non-toxic materials. For example, California awards an increasing amount of competitive points in its QAP for projects that commit to reducing energy consumption in an existing building by a 15-30%, and combines that with prescriptive measures for materials and water consumption. It is aided in this process by a state-wide energy efficiency assessment and testing protocol covering multifamily buildings. *We recommend that states set similar types of performance expectations using either their own state energy standards or the national standards from HUD, FHA and Fannie Mae to govern the rehab process.*

4. Require energy monitoring/ reporting and establish standard methods for quantifying environmental and health benefits of green building.

All 34 states interviewed discussed the tension between building green and maximizing cost-efficiency. To address this issue, there is a need for additional information on the relative value of the benefits of building green, particularly in the area of energy efficiency. Some state agencies have already taken initiative to address this knowledge gap. After conducting rigorous studies to evaluate the benefits provided by different energy efficient systems in several Vermont buildings, the Vermont HFA now requires a stringent design standard that may entail higher capital costs, but has

RHODE ISLAND'S
KeepSpace Communities

"Evaluative Criteria (9). Each application will be evaluated on the extent to which it supports the principles of a KeepSpace Community. Rhode Island Housing has brought together advocates for jobs, the environment, safe homes and the many components that are essential to a good, safe, healthy community to create KeepSpace: where neighbors meet, people work, children play…By attempting to reuse existing developed land that has been underutilized or abandoned, KeepSpace communities will help preserve a precious Rhode Island commodity: open space. Creative partnerships will result in thriving neighborhoods with good-paying jobs, and homes that are beautiful, convenient and affordable. Schools, services, church and cultural centers would all be close-by. Close proximity, coupled with conveniences like bike paths and public transit will help minimize traffic and air pollution. And green building practices will protect and reuse natural resources."

From Rhode Island's 2012 QAP

Walk Score
MICHIGAN

Many states offer points for each amenity or transit option offered within a certain distance of a proposed development's center. Michigan's 2012 QAP relies on Walk Score as a proxy for smart growth development:

"A maximum of 10 points will be awarded on a sliding scale using a project's Walk Score, which can be determined by going to: www.walkscore.com." The following diagram illustrates how the HFA converts a Walk Score into a point item in the application:

Walk Score:	86
Divided by 100:	0.86
Multiplied by 10:	8.6
(Rounded up if applicable)	
Equals Site Amenities Points:	9

What is Smart Growth?

- Preserving open space, farmland, natural beauty and critical environment areas;
- Prioritizing locations that permit access to a range of transportation choices;
- Creating walkable neighborhoods;
- Encouraging investment and redevelopment in existing communities;
- Using existing infrastructure;
- Revitalizing and adding amenities in areas that have suffered from disinvestment;
- Supporting the construction of healthy homes built with green building techniques and materials;
- Providing a critical part of the response to climate change

From the EPA's: "Smart Growth and Affordable Housing" site (http://www.epa.gov/smartgrowth/topics/ah.htm) and Smart Growth Online (http://www.smartgrowth.org/why.php).

been demonstrated to reduce operating costs.[7, 8] New Jersey is working with hundreds of building tenants, building managers, and utility companies to examine utility usage in buildings with energy upgrades, and is compiling a final report on their findings. Minnesota uses benchmarking tools to continually monitor building performance across multiple existing properties. Data-driven evidence is extremely effective in convincing developers and other stakeholders to accept more rigorous design standards that can entail greater capital costs, but currently there is little consensus on how to best measure and allocate the utility bill savings associated with energy efficient building design.

It is unlikely that such a consensus will emerge until there is a standard method of collecting and reporting building-wide energy use across all LIHTC properties. A standard method of collecting and reporting energy use should be developed and incorporated into the HUD LIHTC database, which currently maintains only a handful of LIHTC statistics, such as the placed-in-service year, financing sources, number of units, and location. A single system and database would allow comparisons to be made across state lines, inform federal and state policy, allow longitudinal studies to be undertaken, and spur the development of more robust financial arguments for upfront investments in energy efficient building design.

At the same time, the financial benefits of some green building measures are significantly more challenging to quantify, particularly those measures that contribute to broader health and environmental outcomes. These benefits are real but are almost never included in the funding discussion of affordable housing because developers and investors rarely, if ever, derive direct financial benefit from them.

Several efforts exist that demonstrate the financial benefits of health and sustainability measures. Philadelphia, Portland, and Washington, D.C. have studied and calculated the benefits of stormwater management and urban trees.[9, 10] A 2011 study

7 Shapiro, Andrew. *A Roadmap for Housing Energy Affordability: Preserving Vermont's Affordable Rental Housing*. Vermont Housing Finance Agency & Vermont Housing Conservation Board, March 2011. Web. 12 Oct 2012. <http://www.vhcb.org/roadmapsm.pdf>.

8 CX Associates, LLC, , Benjamin Fowler, Matthew Napolitan, and Jennifer L. Chiodo. *Mechanical System Optimization Guide: A report on the design and procurement of mechanical systems for multi-family rental housing.* Vermont Housing Conservation Board, March 2011. Web. 12 Oct 2012. <http://www.vhcb.org/pdfs/optimization-sm.pdf>.

9 Entrix. City of Portland. Bureau of Environmental Services. *Portland's Green Infrastructure: Quantifying the Health, Energy, and Community Livability Benefits.* 2010.

10 Deutsch, Barbara, Heather Whitlow, Michael Sullivan, Anouk Savineau, and Brian Busiek. United States. Environmental Protection Agency. *Green Build-out Model: Quantifying the Stormwater Management Benefits of Trees and Green Roofs in Washington, DC.* 2007.

produced by the National Trust for Historic Preservation's Preservation Green Lab examined the environmental and health benefits of re-used buildings. Using Life Cycle Assessment, the authors found that re-used buildings had better health outcomes and fewer negative environmental impacts than new construction.[11]

Other studies have found significant correlations between green housing and tenant health. Adverse respiratory health effects have been associated with building materials that contain VOCs, particularly formaldehyde.[12, 13, 14] Applying the Precautionary Principle to avoid these materials is a common green building practice. However, efforts to quantify the financial benefits conferred to tenants and the healthcare system, including federally funded programs like Medicare and Medicaid, by green building are virtually non-existent. *We recommend that state HFAs, green building organizations, and other affordable housing stakeholders work collaboratively to develop metrics that accurately appraise the value of those benefits. This appraisal would help support efforts to direct other public resources to affordable housing, thus relieving some of the green building cost burden from falling entirely on the LIHTC program.*

11 Frey, Patricia, Liz Dunn, Ric Cochran, et al. "The Greenest Building: Quantifying the Environmental Value of Building Reuse." *National Trust for Historic Preservation: Preservation Green Lab.* 2011.

12 Breysee, Jill, David E. Jacobs, et al. "Public Health Reports." *Public Health Reports*. 126.1 (2011): 64-75. Web. 18 Oct. 2012.

13 Jacobs, David E., Jonathan Wilson, et al. "Environmental Health Perspectives." *Environmental Health Perspectives*. 4.117 (2009): 597-604. Web. 18 Oct.

14 Noreen Beatley, ed. *Green Housing = Improved Health: A Winning Combination.* National Center for Health Housing, Print.

5. Require independent verification of green building measures.

Of the 34 states interviewed, three-quarters said they rely on an independent third party, such as a LEED for Homes Green Rater, HERS Rater, state HFA inspector, or other qualified expert, to verify that the green building measures committed to in funded applications are incorporated into the final project. Some states have struggled with developer compliance in the past and have found that using third-party verifiers is necessary to ensure that the built projects are consistent with developer commitments. Those states that rely on the project architect to sign off on green design features without an independent verifier cannot be certain that the proposed measures are implemented in construction, or that the benefits are being realized by tenants. A key pitfall of self-verification is that the developer team may lack the necessary experience and expertise to accurately determine whether green building measures have been successfully implemented.

Many HFAs have found third party certification programs useful because they use established protocols for verifying green building measures and practices. This removes the burden from state agencies to define compliance standards and testing procedures. *We recommend that all HFAs use independent, third party verifiers to ensure the complete and correct implementation of the required green building measures into development projects.*

CONCLUSIONS AND NEXT STEPS

The results of 2012 analysis clearly demonstrate that energy efficiency and green building are fundamental elements of the QAPs for many states, and that there is a strong interest to make continual improvements to the green building criteria. Still, there remains a vast realm of possibility to further improve the quality of design, thoroughness of construction, and delivery of benefits to low-income families. The recommendations in this report represent critical steps that need to be taken in order to ensure that a minimum level of green building is incorporated into projects funded through the Low-Income Housing Tax Credit.

Implementing these recommendations will require a concerted, collaborative effort that includes developers, state and federal agencies, investors, and the green building community. Some of the collaborative efforts will need to focus on solving complex technical issues such as monitoring practices and benefit quantification. In other instances, the focus will need to be on standardizing processes, such as determining how to approach rehabilitation projects or specifying smart growth criteria. Changes to codes and federal regulation will require a combination of technical and policy expertise, combined with a strong and diverse coalition.

Nationally, the Green Affordable Housing Coalition provides a platform to clarify and refine what revisions and additions could be proposed for IRS Section 42. State level refinements to future QAPs regarding verification procedures, rehabilitation approach, and specific smart growth and neighborhood design criteria could be informed by guidance developed through the National Council of State Housing Agencies (NCSHA), the investor community of the Affordable Housing Investors Coalition, and technical experts in the field. Efforts to expand cost-benefit analysis to include health and environmental issues should involve leading national green building, building science, public health, and sustainable development organizations.

Looking forward, there remains a need for additional information on the practices being implemented in the individual states, particularly related to the green building measures and certifications that are being achieved by specific projects. There is also an opportunity to increase the sharing of best practices among the states through conference presentations, workshops, and updates to HUDs LIHTC database.

The scope of green affordable housing also needs to expand beyond tax credit funded projects. This includes funding sources such as Department of Agriculture Rural Housing Section 514/516, HUD Section 202 and 818, HUD Choice Neighborhoods, and potentially Section 8. Green criteria are currently present in a number of the above funding sources, but there is large variation in the scope of topics addressed and the level of achievement that is required or encouraged. The possibility exists to streamline and align these criteria so they are consistent with LIHTC requirements, thus facilitating the process for both developers and agency staff.

Global Green USA looks forward to pursuing the recommendations and next steps over the coming years in collaboration with the diverse stakeholders invested in and committed to improving the quality and livability of the nation's publicly subsidized housing.

APPENDIX 1

Full scorecard

10/28/12	State	SMART GROWTH											ENERGY EFFICIENCY								RESOURCE CONSERVATION									HEALTH PROTECTION											
		BR	UI	AR	PT	PS	XH	RP	HP	FP	WP	SG Total	PV	SP	IS	EP	HV	EC	EB	EE Total	EF	RC	MF	WC	NM	UM	CD	SW	RC Total	HZ	EA	HA	QP	QC	QF	QV	HP Total	Perf. Pts	Bonus	Score
A+	CT	1	1	1	1	1	1	1	1	1	1	10	1	1	1	2	2	2	3	12	1	1	1	5	1	1	1	1	12	1	1	5	1	1	1	1	11		5	50
A+	MD	1	1	1	1	1	1	1	1	1	1	10	1	1	1	2	2	2	3	12	1	1	1	5	1	1	1	1	12	1	1	5	1	1	1	1	11		5	50
A	NJ	1	1	1	1	1	1	1	0	0	1	8	1	1	1	2	2	2	3	12	1	0	1	5	0	0	1	1	9	1	1	3	1	1	1	1	9	35	5	48
A	WA	1	1	1	1	1	1	1	1	0	1	9	1	1	1	2	2	2	3	12	0	1	1	5	1	1	1	1	11	0	1	4	1	1	1	1	9	35	3	48
A-	MI	0	1	1	1	1	1	1	1	1	1	9	0	1	1	2	2	0	0	6	1	1	0	5	0	1	0	1	9	1	1	5	1	1	0	1	10	35	5	46
A-	MN	0	1	1	1	1	1	1	1	1	1	9	1	1	1	2	2	2	3	12	0	0	1	5	0	0	1	0	7	1	1	3	1	1	0	1	8	35	5	46
A-	OR	0	1	1	1	1	1	1	0	0	0	6	0	1	1	2	0	2	0	6	0	0	1	5	1	0	1	1	9	0	1	0	1	0	1	1	4	35	4	46
A-	NM	1	0	1	1	0	1	1	0	0	0	5	1	1	1	2	2	0	0	7	1	1	1	5	0	1	1	0	10	0	0	0	1	1	1	1	4	35	4	45
A-	CA	0	0	1	1	1	1	1	0	0	0	5	1	1	1	2	2	2	0	9	1	0	1	5	1	1	1	1	11	0	1	1	1	1	1	1	6	35	2	44
A-	FL	0	1	0	1	1	1	1	0	0	0	5	1	1	0	2	1	2	3	10	0	1	1	5	1	0	0	0	8	0	1	1	1	1	1	0	5	35	2	44
A-	MA	0	1	1	1	1	1	1	1	0	1	8	1	1	1	2	2	2	3	12	1	1	1	5	1	0	1	1	11	0	1	5	1	1	1	1	10		3	44
A-	OH	0	1	1	1	1	1	1	1	1	1	9	0	1	0	2	2	0	3	8	1	0	0	5	0	0	1	0	7	1	1	5	1	1	1	1	11	35	4	44
A-	PA	1	1	1	1	1	1	1	0	1	1	9	1	1	1	2	2	2	3	12	0	1	0	4	1	1	1	1	9	1	1	4	1	1	1	1	10		4	44
A-	VT	1	1	1	1	1	1	1	1	1	1	10	1	1	1	2	2	2	3	12	1	1	1	5	1	0	1	1	11	1	0	1	1	1	1	1	6		5	44
A-	GA	1	0	1	1	1	1	1	1	1	1	9	0	1	1	2	2	2	3	11	0	0	1	3	0	0	0	0	4	1	1	4	1	1	1	1	10	35	4	43
A-	VA	0	0	1	1	0	1	1	0	0	0	4	1	1	1	2	2	2	3	12	0	0	1	2	0	0	0	0	3	0	1	0	0	0	0	1	2	35	5	43
B+	CO	0	0	1	1	1	1	1	1	1	1	8	0	1	1	1	2	2	3	10	1	0	0	5	0	0	1	0	7	1	1	2	1	1	1	1	8	35	2	41
B+	IL	0	0	1	1	1	1	1	1	1	1	8	0	1	1	2	2	2	0	8	1	0	1	3	0	0	0	1	6	1	1	1	1	1	1	1	7	35	2	41
B+	MO	0	1	1	1	1	1	1	0	0	0	6	0	1	0	2	2	2	0	7	0	0	1	0	0	0	0	0	1	1	1	5	0	0	0	1	8	35	2	41
B+	RI	1	1	1	1	1	1	1	1	1	1	10	1	1	1	2	1	0	3	9	1	1	1	2	0	0	1	1	7	1	1	5	1	0	1	1	10		5	41
B+	NY	1	1	1	1	1	1	1	1	1	1	10	1	1	0	2	2	0	3	9	1	1	0	4	0	1	1	1	9	0	1	3	1	1	1	0	7		5	40
B	NYC	0	1	0	0	0	1	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	2	39
B	ME	1	1	1	1	1	1	1	0	0	0	7	1	1	1	2	2	2	0	9	1	1	1	5	1	0	1	1	11	0	0	2	1	1	1	1	6		5	38
B	IA	0	0	1	1	1	1	1	1	1	1	8	0	1	1	2	2	2	3	11	0	1	1	4	0	0	0	0	6	1	0	1	1	1	1	1	6		5	36
B	NH	1	1	1	0	0	1	1	1	1	1	8	1	1	1	2	2	2	0	9	1	0	1	5	0	0	0	1	8	0	1	2	1	1	0	1	6		5	36
B-	KY	0	0	1	1	1	1	1	0	1	0	6	0	1	1	2	2	2	3	11	0	1	0	3	1	1	1	1	8	0	1	2	0	1	1	1	6		4	35
B-	NC	0	1	1	1	1	1	1	0	1	1	8	0	1	1	2	2	2	3	11	1	0	1	4	0	0	0	0	6	1	1	3	0	0	0	1	6		4	35
B-	DE	0	1	1	1	1	1	1	1	1	1	9	1	1	1	2	2	0	3	10	1	0	1	4	0	0	1	1	8	1	1	2	0	0	0	1	5		2	34
B-	IN	1	1	1	1	1	1	1	0	1	1	9	0	1	1	2	2	2	3	11	0	0	1	3	0	0	0	0	4	1	1	1	0	0	0	1	4		5	33
C	NV	0	1	1	1	1	1	1	0	1	1	8	1	1	1	2	2	2	3	12	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	7		4	32
C	TX	1	1	1	1	1	1	1	0	1	0	8	0	1	1	2	2	0	3	9	0	1	1	5	1	0	0	0	8	1	1	1	1	0	0	1	5		2	32
C	WY	0	0	1	1	1	1	1	1	1	1	8	0	1	0	2	2	2	3	10	0	0	1	3	1	1	0	0	6	1	1	2	0	0	0	1	5		3	32
C	MT	1	1	1	1	1	1	1	0	0	0	7	1	1	1	2	2	2	0	9	0	1	1	5	0	1	1	1	10	0	0	0	1	0	1	1	3		0	29
C	AZ	0	0	1	1	1	1	1	1	1	1	8	0	1	1	0	2	2	0	6	0	0	1	5	0	0	0	0	6	1	1	1	1	1	0	1	6		1	27
C	HI	0	1	1	1	1	1	1	0	0	0	6	1	1	1	2	1	0	0	6	1	1	0	5	0	1	0	1	9	0	1	1	1	1	1	1	6		0	27
C	ND	0	0	1	0	1	1	1	1	1	1	7	0	1	1	2	2	0	0	6	0	0	0	5	0	1	1	0	7	0	1	2	1	1	1	1	7		0	27
C	LA	0	0	1	1	1	1	1	0	1	1	7	0	1	1	1	2	2	3	10	0	0	1	0	0	0	0	0	1	1	1	1	0	0	0	0	3		5	26
C	AL	0	0	1	1	1	1	1	0	1	1	7	1	1	1	2	2	2	0	9	0	0	1	0	0	0	0	0	1	1	1	3	0	0	0	1	6		2	25
C	KS	0	1	1	1	1	1	1	1	1	1	9	0	1	1	0	2	2	3	9	0	0	0	1	0	0	0	0	1	1	1	1	0	0	0	1	4		2	25
C	SC	0	0	1	0	1	1	1	0	1	1	6	0	1	1	2	2	2	3	11	0	0	1	2	0	0	0	0	3	1	1	1	0	0	0	0	3		2	25
C	AR	0	0	1	1	1	1	1	1	1	1	8	0	1	1	0	2	2	0	6	0	0	1	1	0	0	0	0	2	1	1	3	0	0	0	1	6		2	24
C	ID	0	1	0	0	0	1	1	0	0	0	3	0	1	1	2	2	2	0	8	0	0	1	5	0	0	0	1	7	0	1	3	1	1	0	0	6		0	24
C	SD	0	0	1	0	1	1	1	0	1	0	5	0	1	1	2	1	0	3	8	0	0	1	4	0	0	0	0	5	1	0	0	1	1	1	1	5		0	23
D	WI	0	1	1	1	0	1	1	0	0	0	5	0	1	1	2	2	1	0	7	0	1	0	2	0	1	0	0	4	1	0	2	0	0	0	1	4		0	20
D	DC	0	1	0	1	0	1	1	0	0	0	4	0	1	1	0	2	1	3	8	0	0	1	1	0	1	0	0	3	0	0	3	0	0	0	0	3		1	19
D	NE	0	0	1	1	1	1	1	0	0	0	5	0	1	0	1	2	0	0	4	0	1	0	3	0	0	1	0	5	0	1	3	1	0	0	0	5		0	19
D	UT	0	1	1	1	0	1	1	0	1	0	6	0	1	1	1	2	2	3	10	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2		0	18
D	WV	0	0	1	1	1	1	1	0	1	0	6	0	1	0	2	2	2	0	7	0	0	1	2	0	0	0	0	3	1	0	0	0	0	0	1	2		0	18
D	MS	0	0	1	0	0	1	1	0	0	0	3	0	1	1	2	2	0	0	6	0	0	1	2	0	0	0	0	3	0	1	0	1	1	1	1	5		0	17
D	TN	0	1	1	1	1	1	1	0	1	0	7	0	1	0	2	2	2	0	7	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0		0	15
D	AK	0	0	1	0	0	1	1	0	0	0	3	0	1	0	2	0	2	3	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1		2	14
D	OK	0	0	1	0	0	1	0	0	0	0	2	1	1	1	2	2	0	0	7	0	0	0	2	0	0	0	0	2	0	1	0	1	0	0	0	2		0	13
No. Pts		15	31	48	43	41	52	51	21	32	29	363	22	51	42	90	94	74	90	463	18	19	36	170	13	15	21	20	312	29	40	104	33	28	26	41	301			42

APPENDIX 2

Subtopic Scoring for Performance States

Grade	State	Brownfield Redevelopment	Urban Infill	Proximity to Transit	Proximity to Services	Revitalization Plans	Const. Waste Management	Photovoltaics	Stormwater Management	Recycled Content	Renewable Materials	Total	Perform. Points	Bonus	Score
A	NJ	1	1	1	1	1	1	1	1	0	0	8	35	5	48
A	WA	1	1	1	1	1	1	1	1	1	1	10	35	3	48
A-	MI	0	1	1	1	1	0	0	1	0	1	6	35	5	46
A-	OR	0	1	1	1	1	1	1	0	1	0	7	35	4	46
A-	MN	0	1	1	1	1	1	0	0	0	0	5	35	5	45
A-	NM	1	0	1	0	1	1	1	0	0	1	6	35	4	45
A-	CA	0	0	1	1	1	1	1	1	1	0	7	35	2	44
A-	FL	0	1	1	1	1	0	1	0	1	1	7	35	2	44
A-	OH	0	1	1	1	1	1	0	0	0	0	5	35	4	44
A-	GA	1	0	1	1	1	0	0	0	0	0	4	35	4	43
A-	VA	0	0	1	0	1	0	1	0	0	0	3	35	5	43
B+	IL	0	0	1	1	1	0	0	1	0	0	4	35	2	41
B+	MO	0	1	1	1	1	0	0	0	0	0	4	35	2	41
B+	CO	0	0	1	1	1	1	0	0	0	0	4	35	1	40
B	NYC	0	1	0	0	1	0	0	0	0	0	2	35	2	39
		4	9	14	12	15	8	7	5	4	4				44

APPENDIX 3

Bonus Scoring

	Third Party Verifier (2)	In-Agency Technical Assistance (2)	Additional Resources (1)	*Bonus Points*
CT	X	X	X	5
MD	X	X	X	5
NJ	X	X	X	5
WA		X	X	3
MI	X	X	X	5
MN	X	X	X	5
OR	X	X		4
NM	X	X		4
CA	X			2
FL	X			2
MA	X		X	3
OH	X	X		4
PA	X	X		4
VT	X	X	X	5
GA	X	X		4
VA	X	X	X	5
CO	X			2
IL	X			2
MO	X			2
RI	X	X	X	5
NY	X	X	X	5
NYC	X			2
ME	X	X	X	5
IA	X	X	X	5
NH	X	X	X	5
KY	X	X		4
NC	X	X		4
DE	X			2
IN	X	X	X	5
NV	X	X		4
TX	X			2
WY		X	X	3
ND				0
MT				0
AZ	X		X	1
HI				0
LA	X	X	X	5
AL	X			2
KS	X			2
SC	X			2
AR	X			2
ID				0
SD				0
WI				0
DC				0
NE				0
UT				0
WV				0
MS				0
TN				0
AK	X			2
OK				0

*Italics indicate the state mentions third-party programs in their QAP.

*Gray states did not participate in the interview.

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