

2017

QAP ANALYSIS

Green Building Criteria in
Low-Income Housing Tax Credit
Programs

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www.globalgreen.org



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Global Green 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 over 20 years, Global Green 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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EXECUTIVE SUMMARY

Twenty years ago, Global Green 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 continues to promote healthy and resource-efficient affordable housing.

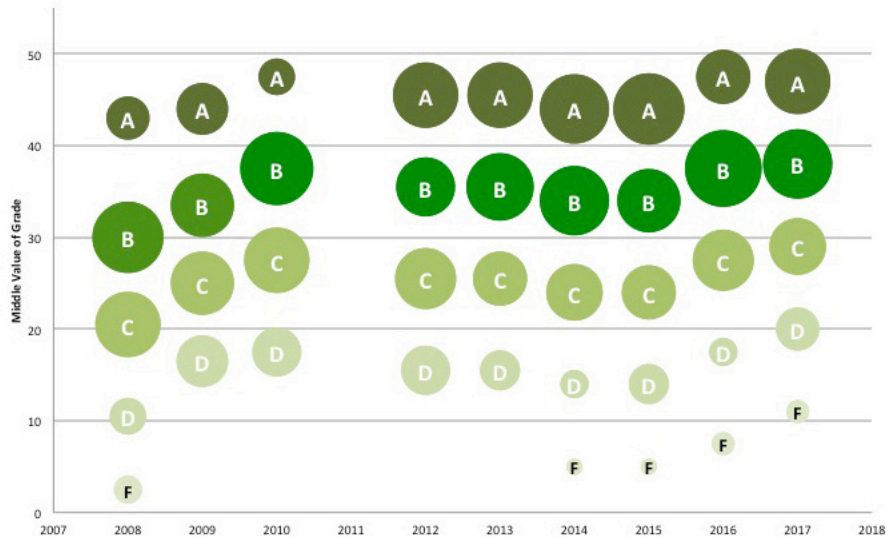
Over the past two decades, green building practices have become increasingly integrated into project design and implementation of low-income housing constructed under the Federal Low-Income Housing Tax Credit (LIHTC) program, and each year, significant strides are being made toward producing higher quality, more efficient dwellings that mitigate negative environmental impacts. These strides and applications not only promote the efficient consumption and reuse of resources such as energy, water, and waste, but to improve the lives of residents through active design and proximity to services such as public transportation and markets with fresh, healthy foods.

Through the years, Global Green has recognized that the LIHTC program and the state-level Qualified Allocation Plans (QAPs) that guide the distribution of tax credits are an effective means to increase the adoption of green building criteria in affordable housing design and construction. Starting in 2006, Global Green has completed a regular review of the green building practices represented in each state's QAP and published a national performance ranking of QAPs. The goal of this analysis is to identify lead-

ing policy trends, share best practices, and suggest technical, procedural, and policy options that can further increase the incorporation of green building procedures into affordable housing developments.

As in past years, QAPs in all 50 states were analyzed, and as has been practice since 2012, New York City and Washington, D.C. were scored as well. This year, we also included an analysis of QAPs from U.S. territories Puerto Rico, U.S. Virgin Islands, Northern Mariana Islands, Guam, and American Samoa. For each of these states, cities, and territories, QAPs and supplemental documents were 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 5 bonus points available for states that demonstrate the adoption of emerging best practices.

Figure 1
Change in Grades, 2010-2017



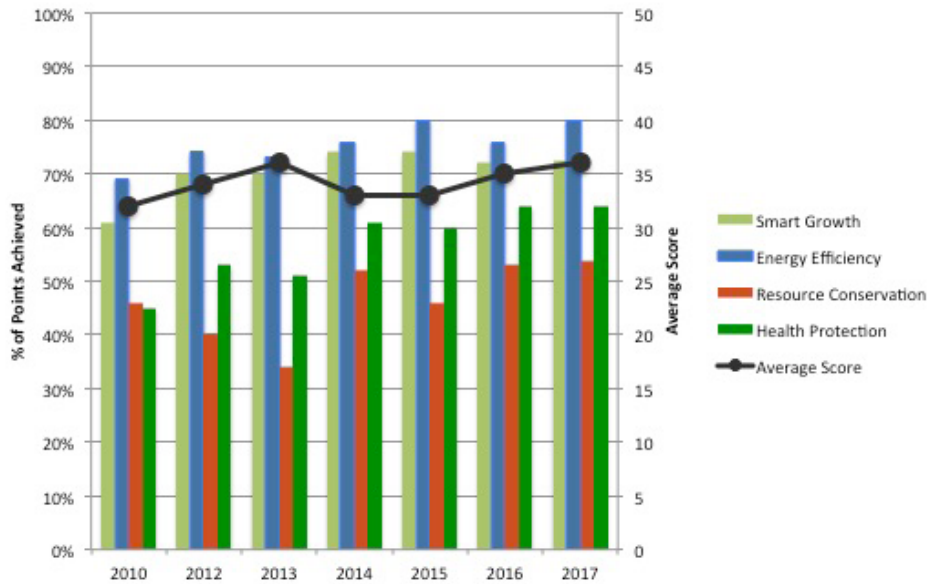
*Note: Global Green did not produce a QAP Analysis Report in 2011, therefore 2011 data is omitted from Figure 1.

Since 2006, the first year of our analysis, the adoption of green building practices in QAPs has grown steadily each year [Figure 1]. The average score of 36 has slightly increased from 2016's average score of 35, and has fluctuated since 2013. This increase in average score is primarily shown with the incremental rise in the incorporation of Energy Efficiency standards and Resource Conservation strategies [Figure 2].

In 2017, nearly three-quarters of all state agencies incorporated Smart Growth principles into their QAPs, and 80% of them included Energy Efficiency standards. Although Smart Growth has remained steadily incorporated in the range of 70%-72% of QAPs since 2010, Energy Efficiency standards have increased

by 4% since 2016, and by 16% (from 69% to 80%) since 2010. References to topics in Energy Efficiency have fluctuated since 2013, with one topic, Energy Codes, notably gaining reference from year to year. The incorporation of Energy Codes has advanced from 58% in 2013, jumping to 87% in 2014, and has now been mentioned in 96% of QAPs in 2017; this is an increase of nearly 40% in four years.

Figure 2
Seven Year QAP Trends, 2010-2017



As in previous years, the overall number of points scored in the Smart Growth and Energy Efficiency categories exceed those scored in Resource Conservation and Health Protection. The percentage of total points scored in Resource Conservation and Health Protection have remained within one percentage point since 2016; However, points scored in Resource Conservation have increased by 20% since 2013, and those scored in Health Protection have increased by 19% since 2010. Most notably, references to existing flora preservation, as well as renewable and reused materials have increased by 6%, 9%, and 7%, respectively. In the Health Protection category, references to topics regarding environmental hazards (hazard proximity, environmental assessment, and hazard abatement) have made gains of 2%-3% each since 2016, and of 16%-18% since 2013.

Receiving a perfect score for the second year in a row, Ohio is joined by Michigan, also having received a perfect score this year. Colorado, Delaware, New York, New Jersey, Pennsylvania, New York City, and Washington D.C. received A's, and seven more states achieved an A-. Altogether, 29% of states scored an A- or better in 2017, and 33% of states scored in the B range. 22% are in the C range, 13% in the D range, and two states received an F this year.

ANALYSIS APPROACH & METHODOLOGY

As in past years, QAPs in all 50 states along with New York City and Washington, D.C. were analyzed and ranked on a 50-point scale. Newly added this year to the analysis are the U.S. territories of Puerto Rico, U.S. Virgin Islands, Northern Mariana Islands, Guam, and American Samoa. The 50-point scale utilized 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 the adoption of emerging best practices.

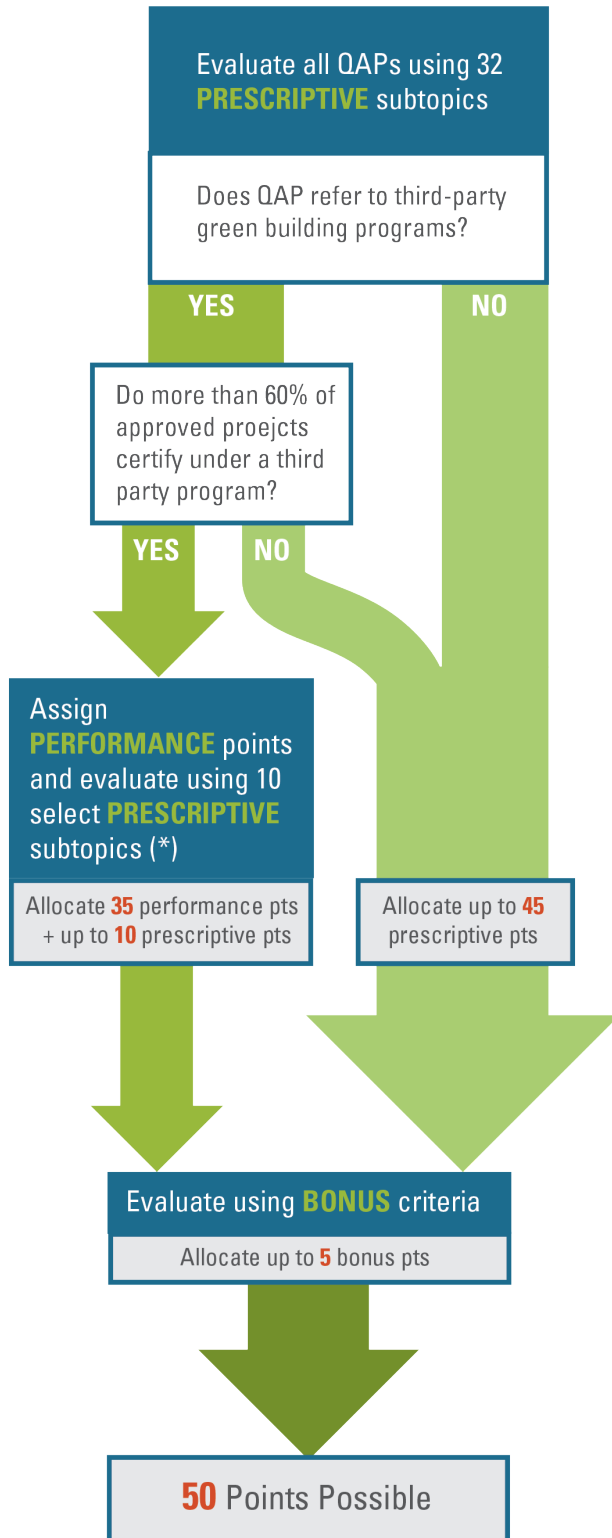
Since our review began in 2005, the national performance ranking we've established has been based on prescriptive green building criteria mentioned in state QAPs and supporting documents in order to determine each state's score and ultimate rank. In 2012, an alternative scoring pathway was created in order to adequately compare states with prescriptive measures in their QAPs to the efforts of states promoting or requiring third-party green building certification programs in their criteria. The first path, prescriptive, accounts for the 32 prescriptive subtopics in our original scoring process and the second path, performance, applies to states where a majority of LIHTC-funded projects (60% or greater) commit to achieve third-party green building certification. These programs include the

U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system, Enterprise Green Communities Initiative, or regional green building programs such as Southface Energy Institute's EarthCraft or Build It Green's GreenPoint Rated Program in California. Each pathway is a distinct 45-point scoring system with the ability to receive up to 5 bonus points, making 50 points the highest achievable score [Figure 3].

The five bonus points, available to all states, cities, and territories regardless of scoring pathway, is comprised of three measures:

- 1 The state housing finance agency requires that all LIHTC-funded projects commit to undergoing third-party green building certification (2 points)
- 2 The state housing finance agency's QAP and/or supporting documents recommend or require energy benchmarking in LIHTC-funded projects (2 points)
- 3 The state housing finance agency's QAP and/or supporting documents recommend or require LIHTC-funded projects are designed to promote active occupants (1 point)

Figure 3
Performance vs. Prescription 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	2
	Heating/Ventilation (1)	
	Cooling (1)	
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	5
	Fixtures (3)	
	Irrigation (1)	
	Landscaping (1)	
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	5
	Lead-Based Paint (1)	
	Asbestos-Containing Materials (1)	
	Radon (1)	
	Groundwater (1)	
	Soil (1)	
QP	Paint (Low/No-VOC)	1
QC	Carpet (Low-VOC)	1
QF	Formaldehyde-Free	1
QV	Quality Ventilation	1

(*) PERFORMANCE SUBTOPICS

TOPIC-BASED ANALYSIS

In our 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 prescriptive subtopics. These subtopics cover a broad spectrum of sustainability and green housing practices, and are distributed amongst the major categories of Smart Growth, Energy Efficiency, Resource Conservation, and Health Protection. This review was conducted from April 2017 to October 2017. Any documents related to the 2017 QAP criteria that were unavailable within that time frame were not evaluated. Possibly influencing scores in a few cases is that several states either had not finalized their QAPs by the end of the review period, or had not displayed their most recent QAP publically online. For those not having a revised QAP displayed, several attempts were made to contact those state housing finance agencies, and in the cases where a the state was unable to be reached, the most recently displayed QAP was used for the analysis.

In addition to evaluating each of the 32 subtopics, the QAPs were reviewed for references to green building certification programs. Each state referring to third-party programs was contacted to determine if a majority of projects receiving allocations chose to pursue certification and thus be eligible for the performance pathway scoring. When scored according to the performance pathway, 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 certification programs. Ten additional points are available to performance states if the QAP specifically references each of ten subtopics [Figure 4].

Figure 4
Performance Subtopics

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

An initial analysis was completed in September 2017 and distributed to each of the state housing finance representatives for review. Comments, clarifications, and additional information received from the state representatives were incorporated into the final analysis and scoring.

SCORING

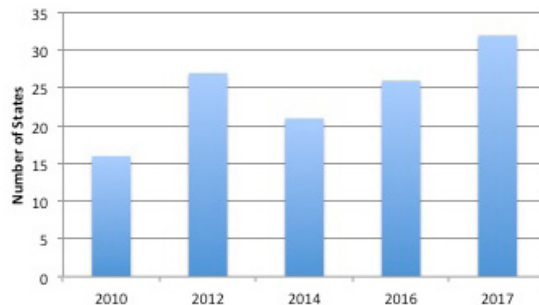
In scoring the states, cities, and territories this year, we found that an all-time high of thirty-two states were incentivizing third-party green building certification programs in their QAPs; this compares to twenty-six states in 2016, and just sixteen in 2010. Of this year's cohort, 15 states were ultimately eligible for the performance pathway scoring [Figure 5].

Interestingly, although more states are moving towards recommending or requiring third-party certification in their QAPs, we found that in some states, developers seem to be moving away from these certifications. For example, we received feedback from the Vermont Housing Finance Agency that in their state, where there are stringent state standards for green building practices, developers do not currently see the value in pursuing certification.

Another example of the movement away from third-party green building certifications is in the state of New Mexico. In past years, New Mexico has consistently yielded projects committing to third-party certification, and has been scored accordingly with the performance pathway. However, the New Mexico Mortgage Finance Authority decided not to allocate points for third-party certification programs in this year's QAP due to the cost of these programs. Instead, they require projects meet a HERS rating for energy efficiency.

Additionally, due to several factors such as the later allocation cycles for some states and the inability to contact some state agencies, we recognize there may be more states eligible for the performance pathway. In the case of three states, the state agencies don't track whether projects commit to third-party certification and in two other states, projects aren't awarded until late October or November. Furthermore, state agencies in seven states allocating points for projects committing to third-party certification were unable to be reached. For these states, their eligibility for the performance pathway could not be determined.

Figure 5
Third Party Programs Mentioned in QAPs, 2010-2017



BONUS STRUCTURE

Up to five bonus points are available to states demonstrating a commitment to the implementation of innovative green building strategies. To better differentiate between the highest performing states and to recognize leading efforts in implementing green building, a revised bonus structure was created in 2016; this revised bonus structure was repeated this year so as to track if these emerging practices are becoming more incorporated as standard practice.

The topics chosen to comprise the bonus structure were identified as emerging practices from our analysis of QAPs from 2013 to 2016, and include topics such as environmental health and resiliency, neighborhood connectivity and walkability, energy benchmarking, and design for active occupants.

For the 2017 analysis, criteria for assigning bonus points are:

Requirement of Third-Party Green Building Certification

Many state housing agencies that award points for use of green building programs allow, or in some cases, require applicants to commit to the standards but do not require formal certification. Requiring all projects to commit to third-party green building certification, which typically requires verification during both design and construction, increases the consistency in delivery of the green building benefits. If commitment to achieving third-party green building certification is required of all projects, this was worth an additional 2 points in our scoring criteria.

Energy Benchmarking

Energy benchmarking tracks utility data in order to monitor system performance as well as reduce overall energy cost and consumption. State housing agencies recommending this practice then incentivize project owners, staff, and residents to better understand system performance, as well as maximize durability and cost savings. Recommending or requiring energy benchmarking was given a bonus of 2 points.

Design for Active Occupants

Encouraging design approaches promoting occupant health through physical activity is increasingly incorporated into the QAPs. Examples of design for active occupants include placing stairways in a more easily accessible and visible location than elevators, providing exercise equipment and/or recreational space for both children and adults, and incorporating gardening space. Incorporating elements for active occupants was given one bonus point.

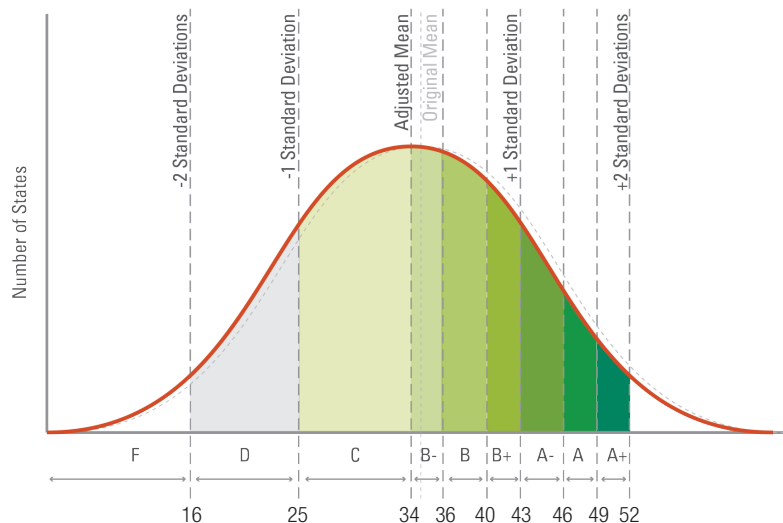
GRADING

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, 9 and 34, respectively [Figure 6]. To establish the grading tiers, the bell curve was adjusted by subtracting two points from the mean, in order to more accurately capture the large cluster of high-performing states. Accordingly, one point was subtracted from the standard deviation in order to more evenly distribute scores along the A through F scale, rewarding high-performing states and prompting those with lower scores to follow the leadership of states with more robust green building practices incorporated into their QAPs. Thus, one standard deviation above the adjusted mean (34-42) denotes the B range, and one standard deviation below the

mean denotes the C range (25-33). Two standard deviations above the mean designates the A range (43-50), and two standard deviations below the mean designates the D range (16-24). The A and B ranges were divided into thirds (B-, B, B+) to distinguish among top scoring states.

Each state was given an opportunity to review the preliminary grading. Individual state scorecards and information on our scoring criteria were sent to a list of contacts first obtained from the National Council of State Housing Finance Agencies (NCHSA) and then updated throughout the analysis and scoring process. A 10-day comment period was provided for states to review and identify any standards, design criteria, or other relevant documents that were overlooked during the assignment of scores.

Figure 6
Grading Distribution



ANALYSIS & FINDINGS

When our analysis began eleven years ago, the average score was 14 out of a possible 45 points. Now in 2017, the average score has grown to 36, a 257% increase. Accordingly, 29 out of 32 subtopics were mentioned in at least half of the state QAPs, an increase of eight subtopics since last year [Figure 7].

As highlighted in last year's report, one factor increasing the representation of prescriptive subtopics and bonus point criteria in the QAPs is that more states are incorporating green building certification criteria as supporting documents to their QAPs. For example, Colorado, Minnesota, New York City, Ohio, Pennsylvania, and Washington D.C. all refer directly to the 2011 or 2015 Enterprise Green Communities Criteria as a supplementary document to their QAPs in order to provide a robust set of green building criteria to LIHTC applicants.

Additionally, increasingly more states are requiring third-party green building certification for LIHTC applicants. States requiring third-party certification this year were Florida, Louisiana, Michigan, Mississippi, New Hampshire, New York City, Ohio, and Washington D.C.; this is twice the amount of states requiring third party green building certification as compared to 2016.

Figure 7
Prescriptive Subtopics Ranked by Change, 2016-2017

Category	Subtopic	Number out of 52 HFAs in 2017	Number out of 52 HFAs in 2016	Change
Smart Growth	Urban Infill	31	23	8
Energy Efficiency	Specified Efficient Products	52	45	7
Resource Conservation	Reused Materials	30	23	7
Resource Conservation	Renewable Materials	25	18	7
Resource Conservation	Existing Flora Preservation	32	26	6
Smart Growth	Habitat Preservation	27	21	6
Energy Efficiency	Insulation Standards	47	42	5
Health Protection	Hazard Abatement	47	42	5
Resource Conservation	Maintenance Free/ Durability	42	37	5
Health Protection	Hazard Proximity	42	37	5
Smart Growth	Floodplain Preservation	40	35	5
Energy Efficiency	Photovoltaics	26	21	5
Smart Growth	Proximity to Public Transit	48	44	4
Resource Conservation	Construction & Demo. Recycling	28	24	4
Smart Growth	Existing Housing Rehabilitation	52	49	3
Health Protection	Environmental Assessment	46	43	3
Smart Growth	Wetlands Preservation	34	31	3
Health Protection	Formaldehyde-Free	29	26	3
Resource Conservation	Water Conservation	50	48	2
Smart Growth	Proximity to Services	47	45	2
Resource Conservation	Stormwater Protection	37	35	2
Health Protection	Carpet	33	31	2
Smart Growth	Revitalization Plans	50	49	1
Energy Efficiency	HVAC Performance	47	46	1
Energy Efficiency	Energy Codes	46	45	1
Health Protection	Paint	33	32	1
Energy Efficiency	Energy Star Homes	27	26	1
Energy Efficiency	Energy Star Appliances	43	43	0
Smart Growth	Brownfield Redevelopment	17	18	-1
Health Protection	Quality Ventilation	39	41	-2
Smart Growth	Adaptive Reuse	37	39	-2
Resource Conservation	Recycled Content Materials	22	25	-3

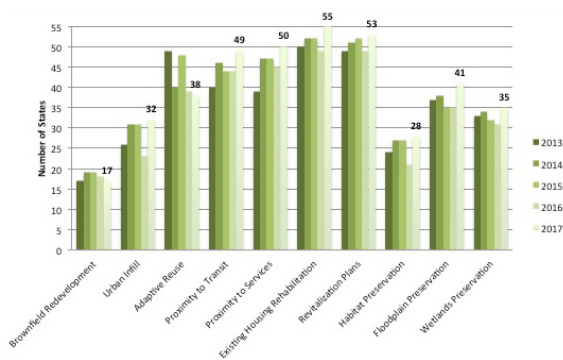
*Note: For the purposes of an accurate comparison between 2016 and 2017, subtopics mentioned in U.S. territory QAPs were omitted from Figure 7.

Smart Growth

The Smart Growth category has seen slight variations through the past few years, but overall subtopic mentions in QAPs has plateaued between 70%-74% since 2012. Seven out of ten subtopics saw a slight uptick since last year; these subtopics are urban infill, proximity to transit, proximity to services, existing housing rehabilitation, habitat preservation, floodplain preservation, and wetlands protection. Most notably, mentions of urban infill increased by 12% and habitat preservation by 7% since last year.

Although it seems Smart Growth subtopics are being increasingly mentioned in QAPs, it is important here to highlight the general trend of Smart Growth subtopics in recent years; from 2012 to 2013, 70% of subtopics were mentioned in QAPs, which then increased to 74% between 2014 to 2015, and decreased back down to 72% in the past two years. Furthermore, many subtopics experienced an increase since 2016, but these levels are either equivalent or lesser than Smart Growth mentions in 2014 and 2015. On the other hand, subtopics such as brownfield redevelopment and adaptive reuse fell by 7% and 10%, respectively since 2016, and the incorporation of revitalization plans did not change [Figure 8].

Figure 8
Smart Growth, 2013-2017

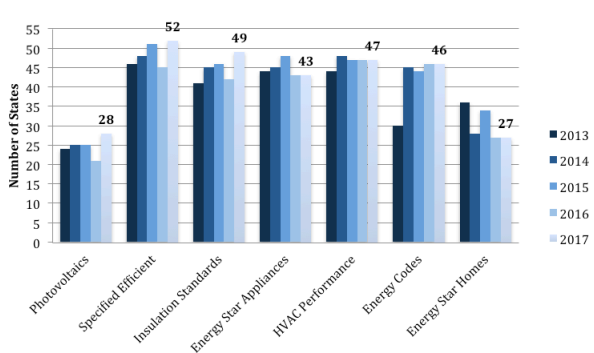


Energy Efficiency

As in past years, Energy Efficiency is the most addressed category in our scoring analysis, with 80% of all possible points scored. References to subtopics in this category all increased since 2016, with the exceptions of Energy Star appliances and HVAC performance, which decreased by only 1%-2%. Mentions of photovoltaics, insulation standards, and energy codes reached all-time highs this year with increases of 7%, 4%, and 6%, respectively since 2016. Most notably, the incorporation of energy codes into QAPs has increased by 38% since 2013 [Figure 9].

Last year, we asserted that decreased references to Energy Star Homes in 2016 may have been a result of increasingly stringent energy codes that address many of the Energy Star Homes issues as well as a growing number of states encouraging the use of comprehensive green building programs which incorporate Energy Star Homes as a standard prerequisite. Although in 2017 this subtopic was mentioned in 62% of QAPs, an increase of 8% since last year, this level of incorporation remains overshadowed by previous years where Energy Star Homes was mentioned in 65% of QAPs in 2015, and in 70% in 2013.

Figure 9
Energy Efficiency, 2013-2017

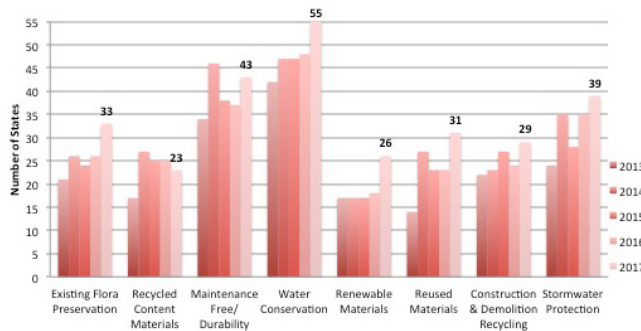


RESOURCE CONSERVATION

Resource Conservation continues to be the least represented category in 2017, however, the percentage of points scored in this category also peaked higher than ever before this year at 54% of all possible points scored by states [Figure 10]. Most subtopics continue to steadily increase in representation; these subtopics include existing flora preservation, maintenance-free and durable materials, renewable materials, reused materials, and construction/demolition recycling plans. Notably, renewable materials and reused materials increased by 9% and 12%, respectively since 2016 and by 31% and 42%, respectively since 2010. This significant increase of recent years indicates a vigorous trend towards the incorporation of green building materials in housing projects, ultimately encouraging resource conservation and locally sourced materials, and discouraging the use of environmentally costly virgin materials.

Mentions of recycled content materials decreased from 52% to 42% since last year, and the incorporation of water conservation practices and stormwater management strategies remained in 80% and 71% of QAPs, respectively. Water conservation continues to be the most robustly represented subtopic in this category, having mentions in all but two state QAPs.

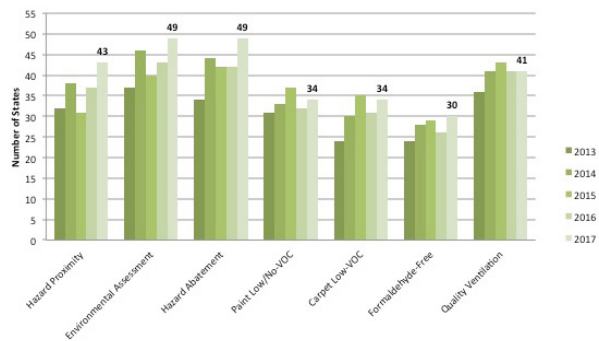
Figure 10
Resource Conservation, 2013-2017



HEALTH PROTECTION

In 2017, Health Protection subtopic mentions varied, but the overall percentage of points scored in this category has remained the same since last year (64%). The subtopics of hazard proximity, environmental assessment, hazard abatement, and formaldehyde-free materials all experienced increased mentions by 1%-3%, with all but formaldehyde-free materials peaking at the highest levels of incorporation since our analysis began in 2006. Conversely, the subtopics of low/ no-VOC paint and low/no-VOC carpet decreased by 2%-3%, and quality ventilation has dipped to its 2010 score of 75%, an 8% decrease from last year [Figure 11].

Figure 11
Health Protection, 2013-2017



FINAL GRADES

In this year's analysis, perfect scores were achieved by the states of Ohio and Michigan. Having improved from an A- in 2016, Michigan joins Ohio in its second consecutive perfect score. Both states not only included all prescriptive subtopics in their QAPs, but also meet all the bonus criteria, and require third-party green building certification, granting them eligible for the performance pathway scoring.

Colorado, Delaware, New York, New Jersey, Pennsylvania, New York City, and Washington D.C. received A's, and seven more states achieved an A-. Collectively, 29% of states scored an A- or better in 2017, and 33% of states scored in the B range. Overall, nearly two-thirds of the states are receiving a B or better, showing persistent progress across the entire cohort, rather than an exemplary elite of high-performers. Of the remaining states, 22% are in the C range, 13% in the D range, and two states received an F this year. Although this year's lowest scores are higher than the lowest scores in 2016, our approach to adjusting the curve this year resulted in one more F score than was given last year. These F's were given to the state of Wisconsin and to the territory of Guam [Figure 12].

Several states' grades rose significantly since 2016, most prominently were New Hampshire with twelve additional points (rising from a B- to an A-), Florida with fourteen additional points (rising from a C to a B+), and Texas with twenty-eight additional points (rising from an F to an A-). New Hampshire and Florida were both scored with the performance pathway this year for the first time, having not been

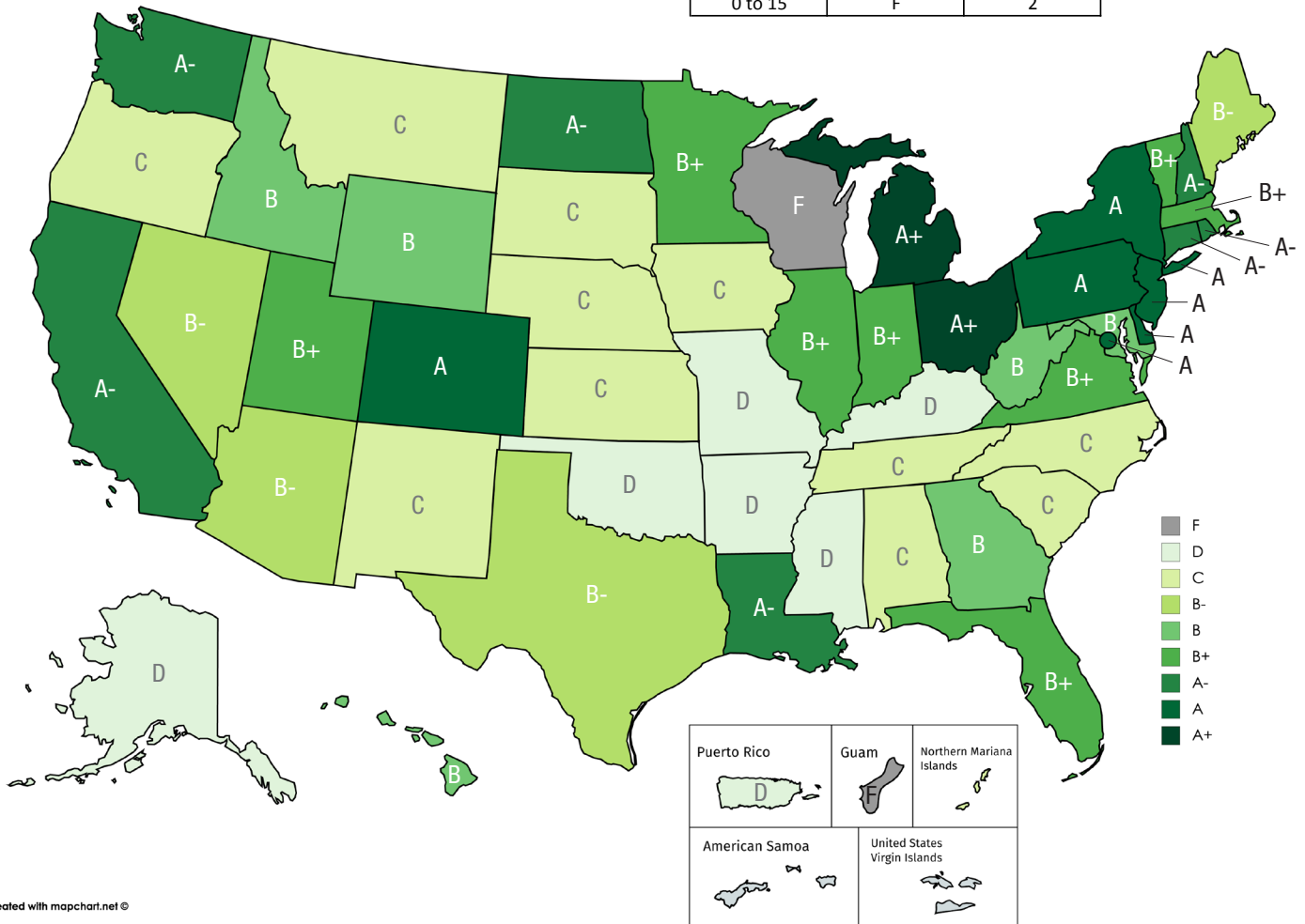
eligible in the past. In the case of Texas, HFA representatives from this state highlighted green building documents supplementing their QAP this year, realizing a significant boost in prescriptive subtopics scored.

On the other hand, several states' grades dropped slightly since 2016, most notably were New Mexico's drop from a B+ to a C (raw score dropped from 41 to 25) and Tennessee's drop from a B to a C (raw score dropped from 39 to 28). Last year, New Mexico was scored with the performance pathway, but this year, their QAP did not allocate points for projects committing to third-party certification due to the costs associated with green building programs. Due to this movement away from incentivizing third-party green building certification in their state, their score was instead derived from the incorporation of prescriptive subtopics. Unfortunately in the case of Tennessee, although third-party green building certification was incentivized in their QAP this year, we were unable to gather the percentage of projects committing to certification and therefore were unable to grant eligibility for performance pathway scoring.

Overall, more states incorporated the bonus point criteria into the QAPs in 2017, raising the average bonus point score from 1.13 to 1.53, with two more states achieving the full five point bonus this year. Also, two more states were scored using the performance pathway in 2017, with seven states requiring LIHTC projects to achieve third-party green building certification.

Figure 12
2017 Grades by State

Score	Grade	# of States
49 to 50	A+	2
46 to 48	A	7
43 to 45	A-	7
40 to 42	B+	8
37 to 39	B	6
34 to 36	B-	4
25 to 33	C	12
16 to 24	D	7
0 to 15	F	2



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U.S. TERRITORIES

Newly added to our analysis this year were QAPs from the U.S. territories of Puerto Rico, U.S. Virgin Islands, Northern Mariana Islands, Guam, and American Samoa. Recent QAPs for 2017 could not be found for any of the territories with the exception of Northern Mariana Islands, and the most recent QAPs for the remaining territories were found for Puerto Rico and Guam in 2016, U.S. Virgin Islands in 2015, and none were found for American Samoa. None of the territories could be reached for further review, updated QAPs, or supplemental documents, despite multiple attempts at contact. We understand that for the U.S. Virgin Islands and Puerto Rico, contact and collaboration was unlikely due to the concurrent timing of our analysis with the series of storms and hurricanes hitting the Caribbean and Gulf areas this fall.

As recent QAPs could not be found for U.S. Virgin Islands and American Samoa, they are omitted from our scoring analysis so as to not introduce (possibly) false outliers to the grading distribution. Furthermore, of those scored, Northern Mariana Islands received a C, Puerto Rico's 2016 QAP received a D, and Guam's 2016 QAP received an F. Following the trends of the rest of the cohort, the majority of points scored in the territory QAPs were in the categories of Smart Growth and Energy Efficiency, with Northern Mariana Islands scoring an impressive 83% of possible points in Resource Conservation [Figure 13].

Figure 13
U.S. Territories Scorecard

Grade	State	SMART GROWTH										SG Total	ENERGY EFFICIENCY							EE Total	RESOURCE CONSERVATION										RC Total	HEALTH PROTECTION							HP Total	Perf. Pts	Bonus	Score
		BR	UI	AR	PT	PS	XH	RP	HP	FP	WP		PV	SP	IS	EP	HV	EC	EB		EF	RC	MF	WC	NM	UM	CD	SW	HZ	EA		HA	QP	QC	QF	QV						
C	NMI	0	0	0	0	1	1	1	0	0	0	3	1	1	1	2	2	2	0	9	1	1	0	4	1	1	1	1	1	10	0	1	1	1	1	1	1	6	0	0	0	
D	PR	0	1	1	1	1	1	1	1	1	9	0	1	1	2	0	2	0	6	0	0	0	4	0	0	0	1	5	1	1	1	1	0	0	0	3	0	0	0			
F	GM	0	0	0	0	1	1	1	0	0	3	1	1	0	2	0	0	0	4	0	0	1	5	0	0	0	0	6	0	1	0	0	0	0	1	2	0	0	0			
F	VI	0	1	1	0	0	1	1	0	0	4	0	0	0	0	0	2	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
N/A	AS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
No. Pts		0	2	2	1	3	4	4	1	1	15	2	3	2	6	2	6	3	24	1	1	1	3	1	1	1	2	21	1	3	2	1	1	1	2	11	Avg.		19			

CONCLUSION AND RECOMMENDATIONS

The integration of green practices into affordable housing continues to both strengthen and expand. As this year's analysis shows there is steady progress toward green building becoming standard practice for all subsidized housing. Looking through the trends in 2017 and reviewing the recommendations from 2016 demonstrate that many of the issues and opportunities remain important to pursue, although some carry increased urgency.

The 2016 QAP report recommendations included the following:

- **Require** benchmarking and monitoring of energy, water, and solid waste. Energy Star Portfolio Manager should be used as a common reporting platform, while encouraging the use of other tools such as WegoWise to provide additional analytic functions and performance comparisons.
- **Expand** the application of criteria related to proactive health strategies. These include: no-smoking requirements, participation in the Energy Star Indoor airPLUS program, integrating active design features such as easily accessible stairs and others described in Enterprise Green Communities 2015 criteria 1.2a Resident Health and Well-Being: Design for Health and the LEED Integrated Process for Health Promotion pilot credit.
- **Update** the definition of Revitalization Plans to include current innovations in neighborhood planning and district scale sustainability. The LEED for Neighborhood Development rating system is a valuable tool for the planning of mid- to large-size projects that span several city blocks and the EcoDistricts Protocol provides a structure for integrating equity, resilience and climate action into a comprehensive neighborhood revitalization plan. Recognition could be given to projects that are located in communities that have committed to either LEED ND or the EcoDistricts Protocol.

■ **Establish** a common standard for addressing resilience in the context of affordable housing design and construction. The Enterprise Community Partners publication, Ready to Respond: Strategies for Multifamily Building Resilience provides guidance on building design and community engagement practices that can be applied to increase resilience. The LEED Pilot Credits "Assessment and Planning for Resilience" and "Design for Enhanced Resilience" also offer guidance on how to make resilience a part of the integrated design process.

The urgency to integrate resilient design strategies into low-income housing developments is increasing rapidly, as evidenced by the increased frequency of climate change-related extreme weather events, such as the hurricanes that impacted Houston and other Gulf communities and the wildfires in Northern California. These events place people and public investments in housing at risk. In response, QAP criteria should include a requirement that LIHTC allocations be directed toward communities that have an up-to-date Emergency Management Plan that includes an evaluation of threats created by climate change. At the project level, incentives should be provided for projects that incorporate battery tied photovoltaic systems and micro grids that can operate autonomously to the electrical grid, to serve as a neighborhood resilience hubs that provide basic services such as refrigeration for medicine, cell phone charging, security lighting, and basic climate control.

APPENDIX 2

2017 Subtopic Scoring for Performance States

Grade	State	Brownfield Redevelopment	Urban Infill	Proximity to Transit	Proximity to Services	Revitalization Plans	Photovoltaics	Recycled Content	Renewable Materials	Construction & Demolition Recycling	Stormwater Management	Total	Performance Points	Bonus	Score
A+	MI	1	1	1	1	1	1	1	1	1	1	10	35	5	50
A+	OH	1	1	1	1	1	1	1	1	1	1	10	35	5	50
A	NY	1	1	1	1	1	1	1	1	1	1	10	35	3	48
A	NYC	1	0	1	1	0	1	1	1	1	1	8	35	5	48
A-	DE	1	1	1	1	1	1	0	0	1	1	8	35	3	46
A-	ND	0	1	1	1	1	1	1	1	0	1	8	35	2	45
A-	LA	0	1	1	1	1	0	1	1	0	1	7	35	3	45
A-	NH	1	1	1	1	1	1	0	0	1	1	8	35	2	45
B+	FL	0	0	1	1	1	0	1	1	0	0	5	35	2	42
B+	IN	1	1	1	1	1	0	0	0	0	1	6	35	1	42
B+	UT	0	0	1	1	1	0	0	1	0	1	5	35	1	41
B+	IL	0	0	1	1	1	0	0	0	0	1	4	35	1	40
B+	VA	0	0	1	0	1	1	0	0	0	0	3	35	2	40
B	HI	0	1	1	1	1	0	0	0	0	0	4	35	0	39
B	ID	0	1	1	1	1	0	0	0	0	0	4	35	0	39
Totals:		4	7	12	11	11	5	4	5	3	8			AVG:	43

APPENDIX 3

Bonus Point Structure in 2017 QAPs

State	Requirement of 3rd Party Green Building Certification (2 pts)	Utility Benchmarking (2 pts)	Health/ Design for Active Occupants (1 pt)
Alabama	0	0	1
Alaska	0	2	1
Arizona	0	0	1
Arkansas	0	0	0
California	0	2	1
Colorado	0	2	1
Connecticut	0	0	1
D.C.	2	2	1
Delaware	0	2	1
Florida	2	0	0
Georgia	0	0	1
Guam*	0	0	0
Hawaii	0	0	0
Idaho	0	0	0
Illinois	0	0	1
Indiana	0	0	1
Iowa	0	0	0
Kansas	0	0	1
Kentucky	0	0	1
Louisiana	2	0	1
Maine	0	0	1
Maryland	0	0	0
Massachusetts	0	0	0
Michigan	2	2	1
Minnesota	0	2	1
Mississippi	2	0	1
Missouri	0	0	1
Montana	0	0	0
Nebraska	0	0	1
Nevada	0	0	1
New Hampshire	2	0	0
New Jersey	0	2	1
NMI*	0	0	0
New Mexico	0	0	1
New York	0	2	1
New York City	2	2	1
North Carolina	0	0	0
North Dakota	0	2	0
Ohio	2	2	1
Oklahoma	0	0	1
Oregon	0	0	0
Pennsylvania	0	2	1
Puerto Rico*	0	0	1
Rhode Island	0	2	1
South Carolina	0	0	1
South Dakota	0	0	0
Tennessee	0	0	1
Texas	0	2	1
Utah	0	0	1
Vermont	0	0	0
Virginia	0	2	0
Washington	0	2	1
West Virginia	0	0	1
Wisconsin	0	0	0
Wyoming	0	0	0
# of States with Bonus Topic	8	17	36



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