SSAFE Review of Green Building Certification Programs
Letter of Explanation

The attached documents were developed by a working group of Senior Stewards Acting for the Environment (SSAFE), a 501(c)(3) nonprofit organization founded by residents of nonprofit senior living communities. SSAFE members have expressed the need for significant greenhouse gas emissions reductions across chapter campuses in pursuit of carbon neutrality. Emissions from the construction and operation of buildings are responsible for the largest segment of global emissions. The authors feel, therefore, that one way of advancing this goal is for communities to seek Green Building Certification through one of the several programs that have emerged over the last 25 years. There is also a marketing advantage in being able to show that your community is serious about addressing the greatest challenge of our age, the warming planet.

This document, entitled "Review of Green Building Certification Programs", explains the history and focus of each program as well as the current fee structure and green building requirements. The programs offer varying levels of certification, from basic to advanced, offering a wide variety of choices for a given residential retirement community. We have narrowed the search to 9 of the most widely used programs in North America, seeking to identify the characteristics of each one. Our aim is to provide a starting point in selecting a building certification program best suited to your campus There are two parts to the review: 1) a matrix comparing fee structures and requirements, and 2) brief narratives highlighting special features of each certification program.

Green building certification programs are periodically updated, as indicated in the matrix below. As a result, this summary analysis will need to be updated every few years as new versions of the certification programs are developed and/or new programs emerge.

We hope you find this review useful as your residential campus pursues its emissions reduction goals.

REVIEW OF GREEN BUILDING CERTIFICATION PROGRAMS COMPARISON MATRIX

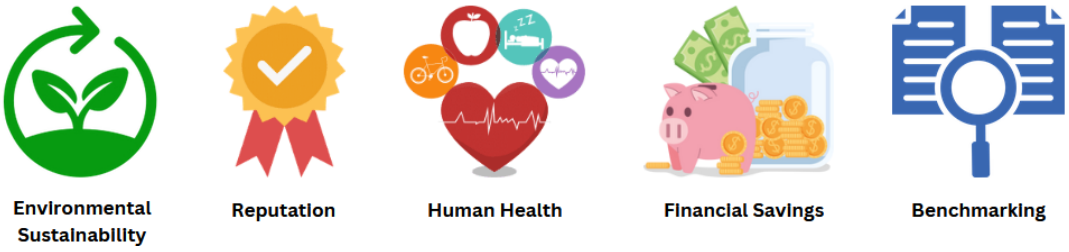
Green Building Certification Program	Reg. fee	Pre-cert. fee	Cert. Fee [a]	Energy Target req'd	GHG Target req'd	Emb. CO_2 Acct'g	Air tight-ness std	Min renew energy req'd	Recert. req'd	Health & wellness	Comments
Energy Star DOE	None		None[a]	ES score 75+	-	-	Typ: 3 ACH50	-	y annual	-	Now the law in NYC: buildings >25ksf must post performance rating
ES NextGen DOE	None		None[a]	ES score 75+	y	-	y	y	y	-	Available Fall 2024
Green Globes Green Bldg Initiative	$1,500		$.03/sf; $15k[a]	ASHRAE 90.1 *or* ES 80+	y	y	y	-	y ev 3 yrs	y	"Robust yet Accessible"
LEED v4.1 USGBC	$1,350-1,750	$4,500	$.056-.064 /sf[a]	3-5% over ASHRAE 90.1 ES 75+	y	y	-	y	y	y	Example cert. fee: For >500,000sf min fee = 31k
LEED v5.0 USGBC	TBD	TBD	TBD	TBD	y	Pre-req	TBD	TBD	TBD	y	Launch in early 2025; Increased emphasis on embodied CO_2
LBC Living Future Inst.	$5,000		$.04-.13/ sf[a]	net positive	y	Pre-req	-	105% on site	Y ev 3 yrs	y	Most stringent, net pos. Carbon ; "regenerative » ; "biophilic"
PHIUS Pass. H'se Inst. US	—		custom quote[c]	Building specific			y 0.060 CFM50	n[d]	-	-	high performance envelope; example cert. fee": >500,000sf = $58,250; most stringent air-tightness standard
WELL Int. WBI	$3,000		$.16/sf[a]	None[b]	-	-	y		ev 3 yrs	y	Focus on health; as of 2023 LEED + WELL = dual certification process
ZERH DOE	NONE		NONE[a]	yes	-	-	y 2015 IECC	y	y	y EPA airPLUS	new construction only; solar, electrical, EV readiness req'd

[a] fees do not include professional architect & engineering additional costs to cover documentation
[b] Indirectly, in recommending air-tight construction to prevent entry of exterior pollution
[c] certification fees for buildings >4,500sf require custom quote
[d] credits granted for on-site generation

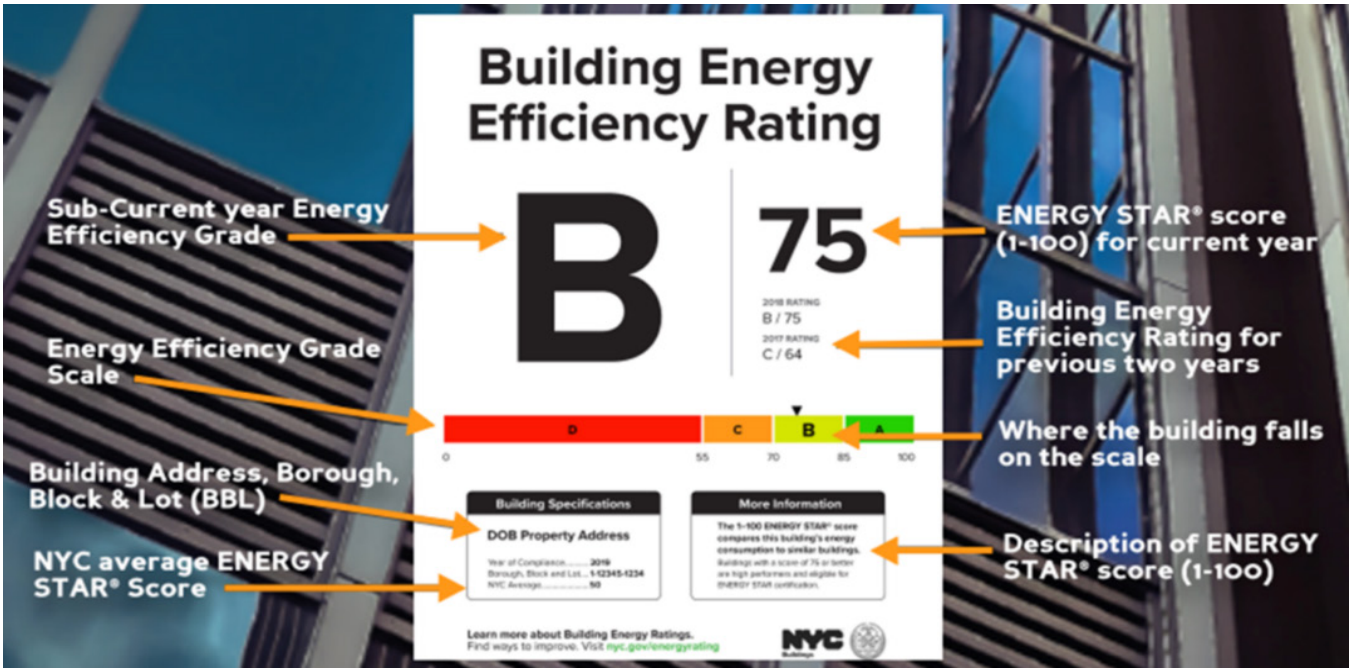
Green Building Certification Programs Narrative

Numerous certification programs have emerged in the past 25 years. It is a highly competitive field, and the many upgrades often reflect how they have influenced each other, and at times collaborated. Along the way, they have had a profound influence on green building design and construction, moving the industry toward less carbon intensive operation and products, as well as being a catalyst for more stringent building codes. **For this analysis we have reviewed nine programs.**

Experts from Yale Sustainability cite the following potential benefits from certification:



1. **Energy Star Certification for Buildings**: https://www.energystar.gov/buildings –EPA/ DOE
   Not to be confused with the Energy Star (ES) product stickers on appliances, this rating system scores energy efficiency in buildings on a scale of 1-100 and issues letter grades from A to F, with 75 or B a minimum requirement to achieve certification. To put it another way "a building must prove that it consumes less energy than seventy-five percent of similar building nationwide." *(Yale Sustainability)*
   The score is determined by using the EPA benchmarking tool Portfolio Manager, to compare building energy performance to similar building types and climate zones. Scores are derived from a building's source EUI (Energy Use Intensity). Several certification programs refer to this minimum DOE score as a base requirement. ES for buildings has been widely adopted nationwide and is even the law in NYC's groundbreaking "Law 97", requiring all buildings over 25,000 sf to publicly post their annual scores.



1 Source: Steven Winter & Associates

The program is performance based, although the website contains massive amounts of energy related information, including energy saving checklists and educational resources to aid in energy efficient design.

2. **Energy Star Next Generation**, available as of fall 2024. This builds on the original certification program and the same comments would apply, with the following added requirements (from the website):
   - **Meet a Direct Emissions Target:** The building's direct (on site) greenhouse gas emissions intensity (GHGi) must be at or below a specified level.
   - **Use Renewable Energy:** The building must obtain at least 30% of the total energy it consumes—or 100% of the total electricity it consumes, if lower—from eligible renewable sources.

3. **Green Globes** https://www.greenglobe.com/ —Green Building Initiative (GBI)
   Green Globes has been available in the US since 2004, with origins in BREEAM Canada. It is known for its user-friendly web-based program and compares favorably with LEED in this regard. The website states: "A formal appeals process exists for final decisions…however, extensive communication between project teams and assessors during the certification process has prevented nearly all appeals during Green Globes' 20-year history." As of 2024, new minimum requirements have been adopted and are reflected in the matrix table. Four levels of certification are available, each with progressively more stringent requirements:

   ONE GREEN GLOBES CERTIFIED — TWO GREEN GLOBES CERTIFIED — THREE GREEN GLOBES CERTIFIED — FOUR GREEN GLOBES CERTIFIED

   Working with the Green Globes rating system will guide users to achieving varying degrees of sustainability.
   Note: See appendix for typical Green Globes scoresheet; and an interview with a Seabury resident.

4. **LEED** https://www.usgbc.org –US Green Building Council (USGBC)
   The USGBC launched a pilot program for LEED (Leadership in Energy and Design) in 1998. Also inspired by BREEAM (UK, the original certification program), it has grown to become the most widely used green building rating system around the globe. It has seen many iterations in 25 years, often in response to criticism from users. Some critics cite an overly burdensome process, heavy on paperwork, which can result in higher consultant fees. On the other hand, many owners find LEED certification worthwhile, citing marketing advantages, increased property values, reduced energy usage and lower operating costs when compared to uncertified projects. The upgrades have improved LEED's many offerings. Certification was originally awarded based on computer simulated performance of a given building design, and now also requires performance data. In 2023 LEED formalized a partnership with WELL to provide dual certification. LEED offers certification at 4 levels:

LEED v4.1 was the first version to issue credits for addressing embodied carbon with the inclusion of Environmental Product Declarations (EPDs).

2. Source: Green Building Alliance

5. LEED v5.0

The most recent version will be "open for registration in early 2025." Its major difference from earlier versions is the focus on embodied carbon. From Steven Winter Associates:

> "LEED v5 is set to elevate this issue to new heights, introducing more robust and comprehensive strategies for addressing embodied carbon throughout a building's lifecycle…It is important to note that for LEED v5 projects, addressing embodied carbon impacts is not an option, but a prerequisite."

5.0 O+M continues to stress the importance of retrofitting existing buildings with added emphasis on decarbonization, and the elimination of on-site combustion of fossil fuels.

Note: see appendix for typical LEED scoresheet; and for user comments on working with LEED rating systems.

6. Living Building Challenge (LBC) https://www.living-future.org –Living Futures Institute

The Living Building Challenge is the most ambitious of all green building rating systems. The LBC Standard is composed of 7 issue areas, or petals. Levels of certification include Core, Petal, and Living. Petal certification must achieve 3 petals, including 1 primary petal (energy, water or materials). To earn a LBC Living certification, all 7 petals must be achieved. Certified buildings are net energy positive, use energy storage for resiliency and have net zero water usage. Certification is performance based, requiring data from an occupied building for a minimum of 12 months. Biophilic design—buildings in which occupants directly interact with nature through views, natural light, interior plantings, and water—is central to the LBC philosophy.

3. Source: Yale Divinity School

LBC publishes a Red List of chemicals representing the "worst in class" substances prevalent in the building industry that pose serious risks to human health and the environment. Since its inception in 2006, the Red List has been an intuitive tool for communicating the need to stop using harmful chemicals.

Given the rigorous requirements, there are fewer certified projects than other programs reviewed here, but the influence on the green building world has been considerable.

7. PHIUS https://www.phius.org –Passive House Institute US

Passive House originated in the US in the '70s, was exported to Germany where it became PassivHaus, was discovered by an architecture student, Kristen Klingenberg, who brought it back to the US in the early 2000s. She founded the Passive House Institute US (PHIUS) and a certification program was launched in 2007. Passive principles are driven by energy efficiency with an emphasis on an air-tight building envelope, continuous high R insulation, high-performance windows (triple glazing) and orientation. Its influence throughout the design and construction industry has been huge, and along with LEED and others has influenced more stringent building codes. PHIUS recognizes the importance of decarbonizing the existing building stock through its PHIUS REVIVE 24. PHIUS buildings are famous for producing dramatic reductions in energy and CO_2 emissions, assured by rigorous quality control requirements. Resiliency is a core element in the PHIUS mission, aiming to enable buildings to remain habitable during extended power disruptions. To quote Klingenberg from a 2022 conference: "[The] Envelope can set the stage for resilience; minimize the energy we need for critical functions." PHIUS has a partnership with DOE's Zero Energy Ready Homes: Certification will earn ZERH status, qualifying projects for eligibility in the ZERH Lender program. *(see #9)*

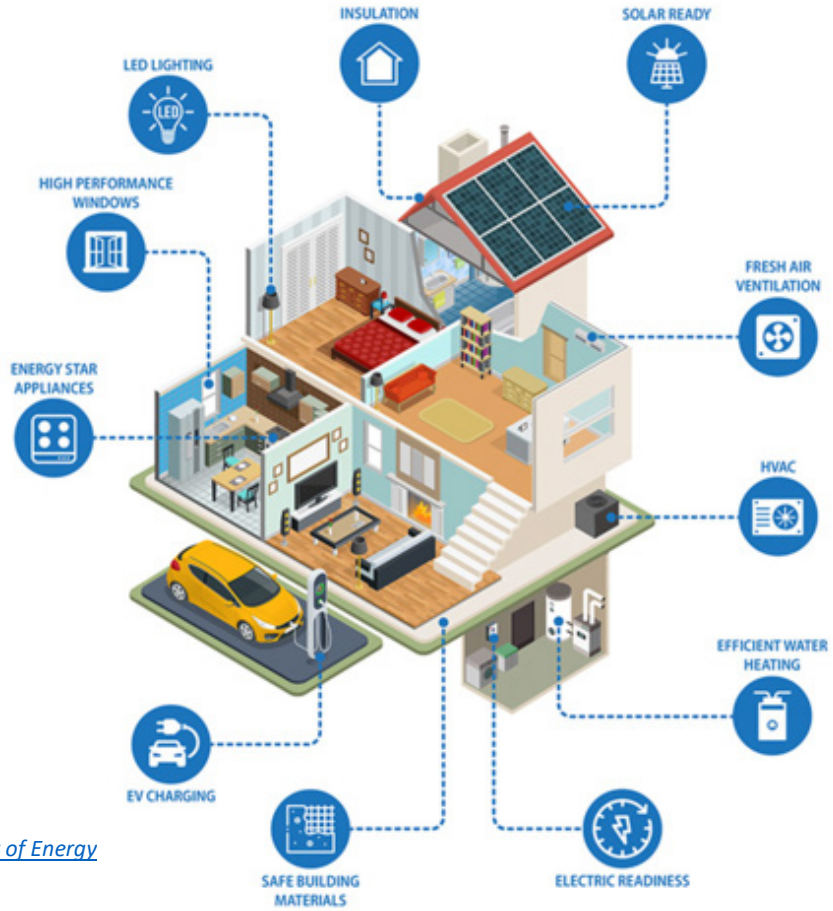
8. **WELL** https://www.wellcertified.com —International Well Building Institute (IWBI)
WELL was founded in 2013 in response to what IWBI felt was missing from the many green building certification programs: health. This focus is evident in the list of precondition requirements: water, nourishment, light, movement, thermal comfort, sound, material, mind and community. Many of these will be familiar to users of other programs, but none with the exclusive emphasis on health. Efficiency can be a byproduct of achieving credit in these areas, such as ensuring an air-tight building envelope to prevent pollution from entering a building. Many large organizations, including Fortune 500 companies, are listed as clients. LEED has had a strategic partnership with WELL which was strengthened in 2023. From the USGBC website, 2023: **"**USGBC and IWBI Strengthen Their Strategic Partnership to Accelerate Healthy Sustainable Building deign—buildings in which occupants directly interact with nature through views, natural light, interior plantings, and water—are central components of the LBC.s". Now applicants to LEED + WELL can achieve dual certification.

9. **ZERH** https://www.energy.gov/eere/buildings/zero-energy-ready-home-program EPA/ DOE

ZERO ENERGY READY HOME
U.S. DEPARTMENT OF ENERGY

DOE's Zero Energy Ready program optimizes the energy efficiency by using proven building materials and components that are properly installed. This approach achieves 40-50% better energy efficiency than standard built homes. Heating/ventilating/AC, lighting, plumbing, windows and appliances are all Energy Star rated. Conduits and chases are pre-installed for the future addition of car chargers, solar panels and their controllers. In short, a quality, efficient, safe home ready to adapt to the future.

The diagram shows how the components of a ZERH project work together to achieve the performance requirements. The "solar ready component" means that the building has a pathway to run wiring, space to connect to the electric panel, and a roof designed to accommodate rooftop solar at some future date. Similarly, infrastructure for an EV charging station is included *now* to avoid costly retrofits, and "electrical readiness" means that homes are ready for current or future installation of heat pumps. From the website: "Laying the groundwork for the next generation of energy technologies during initial construction significantly reduces retrofit cost and complexity for the future."



4. *Source US Department of Energy*

Appendix

1. **Green Globes** Scoresheet

Environmental Assessment Areas & Point Allocation

1	**Project Management**	**50**
1.1	Integrated Design Process (IDP)	9
1.2	Environmental Management During Construction	12
1.4	Commissioning	29
2	**Site**	**115**
2.1	Development Area	30
2.2	Ecological Impacts	32
2.3	Stormwater Management	18
2.4	Landscaping	28
2.5	Exterior Light Pollution	7
3	**Energy**	**390**
3.1	Energy Performance	100
3.2	Energy Demand	35
3.3	Metering, Measurement, and Verification	12
3.4	Building Opaque Envelope	31
3.5	Lighting	36
3.6	HVAC Systems and Controls	59
3.7	Other HVAC Systems and Controls	32
3.8	Other Energy Efficient Equipment and Measures	11
3.9	Renewable Energy	50
3.10	Energy Efficient Transportation	24

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4	**Water**	**110**
4.1	Water Consumption	42
4.2	Cooling Towers	9
4.3	Boilers and Water Heaters	4
4.4	Water Intensive Applications	18
4.5	Water Treatment	3
4.6	Alternate Sources of Water	5
4.7	Metering	11
4.8	Irrigation	18
5	**Materials and Resources**	**125**
5.1	Building Assembly (core and shell including envelope)	33
5.2	Interior Fit-outs (Including Finishes and Furnishings)	16
5.3	Re-use of Existing Structures	26
5.4	Waste	9
5.5	Building Service Life Plan	7
5.6	Resource Conservation	6
5.7	Envelope – Roofing / Openings	10
5.8	Envelope – Foundation, Waterproofing	6
5.9	Envelope – Cladding	5
5.10	Envelope – Barriers	7
6	**Emissions**	**50**
6.1	Heating	18
6.2	Cooling	29
6.3	Janitorial Equipment	3
7	**Indoor Environment**	**160**
7.1	Ventilation	37
7.2	Source Control and Measurement of Indoor Pollutants	46
7 3	Lighting Design and Systems	30
7.4	Thermal Comfort	18
7.5	Acoustic Comfort	29
TOTAL		**1000**

5. *Source: Green Globes*

Seabury, a Life Care Community near Hartford CT, was certified in 2014, and recently their new restaurant "Bistro" achieved certification with 4 Green Globes. In a phone interview in August 2024, a resident who is leading green initiatives at Seabury reported that the initial push for seeking certification came from the CEO and COO. Their restaurant/ "bistro" recently achieved "4 Green Globes". She also noted that the administration was very pleased with the Green Globes team.

2. **LEED** Scoresheet

LEED v4 for BD+C: New Construction and Major Renovation
Project Checklist

Project Name:
Date:

Y	?	N			
			Credit	Integrative Process	1

0	0	0	Location and Transportation		16
			Credit	LEED for Neighborhood Development Location	16
			Credit	Sensitive Land Protection	1
			Credit	High Priority Site	2
			Credit	Surrounding Density and Diverse Uses	5
			Credit	Access to Quality Transit	5
			Credit	Bicycle Facilities	1
			Credit	Reduced Parking Footprint	1
			Credit	Green Vehicles	1

0	0	0	Sustainable Sites		10
Y			Prereq	Construction Activity Pollution Prevention	Required
			Credit	Site Assessment	1
			Credit	Site Development - Protect or Restore Habitat	2
			Credit	Open Space	1
			Credit	Rainwater Management	3
			Credit	Heat Island Reduction	2
			Credit	Light Pollution Reduction	1

0	0	0	Water Efficiency		11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
			Credit	Outdoor Water Use Reduction	2
			Credit	Indoor Water Use Reduction	6
			Credit	Cooling Tower Water Use	2
			Credit	Water Metering	1

0	0	0	Energy and Atmosphere		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
			Credit	Enhanced Commissioning	6
			Credit	Optimize Energy Performance	18
			Credit	Advanced Energy Metering	1
			Credit	Demand Response	2
			Credit	Renewable Energy Production	3
			Credit	Enhanced Refrigerant Management	1
			Credit	Green Power and Carbon Offsets	2

0	0	0	Materials and Resources		13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
			Credit	Building Life-Cycle Impact Reduction	5
			Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
			Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
			Credit	Building Product Disclosure and Optimization - Material Ingredients	2
			Credit	Construction and Demolition Waste Management	2

0	0	0	Indoor Environmental Quality		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
			Credit	Enhanced Indoor Air Quality Strategies	2
			Credit	Low-Emitting Materials	3
			Credit	Construction Indoor Air Quality Management Plan	1
			Credit	Indoor Air Quality Assessment	2
			Credit	Thermal Comfort	1
			Credit	Interior Lighting	2
			Credit	Daylight	3
			Credit	Quality Views	1
			Credit	Acoustic Performance	1

0	0	0	Innovation		6
			Credit	Innovation	5
			Credit	LEED Accredited Professional	1

0	0	0	Regional Priority		4
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1

0	0	0	TOTALS	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

6 Source: LEED

The following is an edited commentary from SSAFE member Steven Fellows, a resident at River Woods in Durham NH, regarding the question of using the LEED checklist as a guide, without seeking certification, to save money and effort:
"Checklists can oversimplify the complexities of green building standards, and without oversight, there's a risk of "greenwashing"—where builders may exaggerate or misrepresent compliance to portray their work as environmentally friendly. Certification, however, ensures rigorous adherence to the standards through independent verification…Without third-party oversight, self-assessment bias becomes a concern. Architects and builders have a vested interest in showcasing their work positively, which can lead to overstatements or selective reporting of compliance. For these reasons, I remain skeptical of claims that a facility is built to a standard without formal certification."

And another comment from SSAFE member Stu White, from Kendal at Hanover:
"I have participated in 4 LEED projects as an architect and can relate to the critics regarding the potentially mind-numbing tasks associated with the documentation process. On the other hand, accepting the tasks and pursuing them with engineers and clients can be team building, and has expanded my understanding of the multiple environmental impacts of construction projects. The process encourages teams to find creative green solutions. 'Point chasing'—pursuing credits that may warp the core mission of a project to achieve a higher score—is a trap that is easy to fall into, and teams need to evaluate each credit in this light.