

New Construction

EA Credit 1: Optimize Energy Performance

1–10 Points (2 Mandatory)

Intent

Achieve increasing levels of energy performance above the baseline in the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

Requirements

Select one of the three compliance path options described below. Project teams documenting achievement using any of the three options are assumed to be in compliance with EA Prerequisite 2.

OPTION 1 — WHOLE BUILDING ENERGY SIMULATION (1–10 Points)

Demonstrate a percentage improvement in the proposed building performance rating compared to the baseline building performance rating per ASHRAE/IESNA Standard 90.1-2004 (without amendments) by a whole building project simulation using the Building Performance Rating Method in Appendix G of the Standard. The minimum energy cost savings percentage for each point threshold is as follows:

New Buildings	Renovations	Points	
10.5%	3.5%	1	Mandatory
14%	7%	2	Points
17.5%	10.5%	3	
21%	14%	4	
24.5%	17.5%	5	
28%	21%	6	
31.5%	24.5%	7	
35%	28%	8	
38.5%	31.5%	9	
42%	35%	10	

Appendix G of Standard 90.1-2004 requires that the energy analysis done for the Building Performance Rating Method include ALL of the energy costs within and associated with the building project. To achieve points using this credit, the proposed design—

- must comply with the mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4) in Standard 90.1-2004 (without amendments);
- must include all the energy costs within and associated with the building project; and
- must be compared against a baseline building that complies with Appendix G to Standard 90.1-2004 (without amendments). The default process energy cost is 25% of the total energy cost for the baseline building. For buildings where the process energy cost is less than 25% of the baseline building energy cost, the LEED submittal must include supporting documentation substantiating that process energy inputs are appropriate.

For the purpose of this analysis, process energy is considered to include, but is not limited to, office and general miscellaneous equipment, computers, elevators and escalators, kitchen cooking and refrigeration, laundry washing and drying, lighting exempt from the lighting power allowance (e.g. lighting integral to medical equipment) and other (e.g. waterfall pumps). Regulated (non-process) energy includes lighting (such as for the interior, parking garage, surface parking, façade, or building grounds, except as noted above), HVAC (such as for space heating, space cooling, fans, pumps, toilet exhaust, parking garage ventilation, kitchen hood exhaust, etc.), and service water heating for domestic or space heating purposes.

For EA Credit 1, process loads shall be identical for both the baseline building performance rating and for the proposed building performance rating. However, project teams may follow the Exceptional Calculation Method (ASHRAE 90.1-2004 G2.5) to document measures that reduce process loads. Documentation of process load energy savings shall include a list of the assumptions made for both the base and proposed design, and theoretical or empirical information supporting these assumptions.

OR

OPTION 2 — PRESCRIPTIVE COMPLIANCE PATH (4 Points)

Comply with the prescriptive measures of the ASHRAE Advanced Energy Design Guide for Small Office Buildings 2004. The following restrictions apply:

- Buildings must be under 20,000 square feet
- Buildings must be office occupancy
- Project teams must fully comply with all applicable criteria as established in the Advanced Energy Design Guide for the climate zone in which the building is located

OR

OPTION 3 — PRESCRIPTIVE COMPLIANCE PATH (1 Point)*

Comply with the Basic Criteria and Prescriptive Measures of the Advanced Buildings Benchmark™ Version 1.1 with the exception of the following sections: 1.7 Monitoring and Trend-logging, 1.11 Indoor Air Quality, and 1.14 Networked Computer Monitor Control. The following restrictions apply:

- Project teams must fully comply with all applicable criteria as established in Advanced Buildings Benchmark for the climate zone in which the building is located.

**Please note that Option 3 does not currently provide enough points to meet the mandatory minimum for new construction projects.*

Existing Buildings

EA Credit 1 Optimize Energy Performance

1–10 Points (2 Mandatory)

Intent

Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.

Requirements

Demonstrate the EPA ENERGY STAR energy performance rating that the building has achieved. Utilize ENERGY STAR's Portfolio Manager tool for building types addressed by ENERGY STAR,

OR

For building types not addressed by ENERGY STAR, demonstrate the ENERGY STAR equivalent rating for the building energy use, calculated using the alternate method described in the LEED-EB Reference Guide.

ENERGY STAR Rating	LEED-EB Points	
63	1	Mandatory Points
67	2	
71	3	
75	4	
79	5	
83	6	
87	7	
91	8	
95	9	
99	10	

Core & Shell

Optimize Energy Performance

1–8 Points (2 Mandatory)

Intent

Achieve increasing levels of energy performance above the baseline in the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

Requirements

Select one of the three compliance path options described below. Project teams documenting achievement using any of the three options are assumed to be in compliance with EA Prerequisite 2.

OPTION 1 — WHOLE BUILDING ENERGY SIMULATION (1–8 Points)

Demonstrate a percentage improvement in the proposed building performance rating compared to the baseline building performance rating per ASHRAE/IESNA Standard 90.1-2004 (without amendments) by a whole building project simulation using the Building Performance Rating Method in Appendix G of the Standard. The minimum energy cost savings percentage for each point threshold is as follows:

New Buildings	Building Renovations	Points	
10.5%	3.5%	1	Mandatory
14%	7%	2	Points
17.5%	10.5%	3	
21%	14%	4	
24.5%	17.5%	5	
28%	21%	6	
31.5%	24.5%	7	
35%	28%	8	

Appendix G of Standard 90.1-2004 requires that the energy analysis done for the Building Performance Rating Method include ALL of the energy costs within and associated with the building project. To achieve points using this credit, the proposed design—

- must comply with the mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4) in Standard 90.1-2004 (without addenda);
- must include all the energy costs within and associated with the building project; and
- must be compared against a baseline building that complies with Appendix G to Standard 90.1-2004 (without addenda). The default process energy cost is 25% of the total energy cost for the baseline building. For buildings where the process energy cost is less than 25% of the baseline building energy cost, the LEED submittal must include supporting documentation substantiating that process energy inputs are appropriate.

For the purpose of this analysis, process energy is considered to include, but is not limited to, office and general miscellaneous equipment, computers, elevators and escalators, kitchen cooking and refrigeration,

laundry washing and drying, lighting exempt from the lighting power allowance (e.g. lighting integral to medical equipment) and other (e.g. waterfall pumps). Regulated (non-process) energy includes lighting (such as for the interior, parking garage, surface parking, façade, or building grounds, except as noted above), HVAC (such as for space heating, space cooling, fans, pumps, toilet exhaust, parking garage ventilation, kitchen hood exhaust, etc.), and service water heating for domestic or space heating purposes.

For EA Credit 1, process loads shall be identical for both the baseline building performance rating and for the proposed building performance rating. However, project teams may follow the Exceptional Calculation Method (ASHRAE 90.1-2004 G2.5) to document measures that reduce process loads. Documentation of process load energy savings shall include a list of the assumptions made for both the base and proposed design, and theoretical or empirical information supporting these assumptions.

OR

OPTION 2 — PRESCRIPTIVE COMPLIANCE PATH (3 Points possible, 2 mandatory)

Comply with the ASHRAE Advanced Energy Design Guide for Small Office Buildings recommendations. Project teams must fully comply with all applicable criteria as established in the ASHRAE Advanced Energy Design Guide for Small Office Buildings for the climate zone in which the building is located. It should be noted that this compliance path may only be used for office buildings up to 20,000 ft².

(Note: the envelope, lighting and HVAC & SWH requirements vary by climate. For each climate there is a table that lists recommended levels for each “system”.)

Envelope Performance: (1 point possible)

Install envelope systems which comply with all the envelope recommendations in the ASHRAE Advanced Energy Design Guide for Small Office Buildings table for the climate zone in which the building is located.

Lighting Systems: (1 additional point possible)

Install lighting systems which comply with all the lighting recommendations in the ASHRAE Advanced Energy Design Guide for Small Office Buildings table for the climate zone in which the building is located.

All such systems shall be included in systems commissioned under EA P1, Fundamental Building Systems Commissioning.

HVAC and Service Water Heater Systems: (1 additional point possible)

Install HVAC and Service Water Heating (SWH) systems which comply with all the HVAC & SWH recommendations in the ASHRAE Advanced Energy Design Guide for Small Office Buildings table for the climate zone in which the building is located.

All such systems shall be included in systems commissioned under EA P1, Fundamental Building Systems Commissioning.

OR

OPTION 3 — PRESCRIPTIVE COMPLIANCE PATH (1 Point)*

Comply with the Basic Criteria and Prescriptive Measures of the NBI Advanced Buildings Benchmark™ Version 1.1 with the exception of the following sections: 1.1 Design Certification, 1.2 Construction Certification, 1.3 Operations Certification, 1.4 Energy Code Compliance, 1.7 Monitoring and Trend-logging,

1.11 Indoor Air Quality, 1.13 Refrigeration Equipment Efficiency Requirements, 1.14 Networked Computer Monitor Control, and 2.3 Cool Roofs and EcoRoofs (Zones 1 through 5). The following restrictions apply:

- Project teams must fully comply with all applicable criteria as established in Advanced Buildings Benchmark for the climate zone in which the building is located.
- Project teams must show compliance with all applicable criteria for all systems that are part of the core and shell work.

**Please note that Option 3 does not currently provide enough points to meet the mandatory minimum for new construction projects.*

Potential Technologies & Strategies

Design the building envelope and systems to maximize energy performance. Use a computer simulation model to assess the energy performance and identify the most cost-effective energy efficiency measures. Quantify energy performance as compared to a baseline building.

If a local code has demonstrated quantitative and textual equivalence following, at a minimum, the U.S. Department of Energy standard process for commercial energy code determination, then the results of that analysis may be used to correlate local code performance with ASHRAE 90.1-2004. Details on the DOE process for commercial energy code determination can be found at www.energycodes.gov/implement/determinations_com.stm.

Commercial Interiors

Mandatory Point Minimum: Two (2) points must be earned in this credit, but can come from any of the four sub-sections.

EAc1.1 Optimize Energy Performance, **Lighting Power**

1 – 3 points

Intent

Achieve increasing levels of energy conservation beyond the referenced standard to reduce environmental impacts associated with excessive energy use.

Requirements

Reduce connected lighting power density below that allowed by ASHRAE/IESNA Standard 90.1-2004* using either the Space-by-Space Method or by applying the whole building lighting power allowance to the entire tenant space.

Option A. Reduce lighting power density to 15% below the standard (1 point)

OR

Option B. Reduce lighting power density to 25% below the standard, (2 points)

OR

Option C. Reduce lighting power density to 35% below the standard. (3 points)

EAc1.2 Optimize Energy Performance, **Lighting Controls**

1 point

Requirements

Install daylight responsive controls in all regularly occupied spaces within 15 feet of windows and under skylights.

EAc1.3 Optimize Energy Performance, **HVAC**

1 – 2 points

Requirements

OPTION A

Implement one or both of the following strategies:

- **Equipment Efficiency: (1 point)**
Install HVAC systems which comply with the efficiency requirements outlined in the New Buildings Institute, Inc.'s publication "Advanced Buildings: Energy Benchmark for High Performance Buildings (E-Benchmark)" prescriptive criteria for mechanical equipment efficiency requirements, sections 2.4 (less ASHRAE standard 55), 2.5, and 2.6.

- **Appropriate Zoning and Controls: (1 point)**
Zone tenant fit out of spaces to meet the following requirements:
 - Every Solar Exposure must have a separate control zone
 - Interior spaces must be separately zoned
 - Private offices and specialty occupancies (conference rooms, kitchens, etc.) must have active controls capable of sensing space use and modulating HVAC system in response to space demand

OPTION B

Reduce design energy cost compared to the energy cost budget for regulated energy components described in the requirements of ASHRAE/IESNA Standard 90.1- 2004.

- Demonstrate that HVAC system component performance criteria used for tenant space are 15% better than a system that is in minimum compliance with ASHRAE/IESNA Standard 90.1-2004. (1 point)

OR

- Demonstrate that HVAC system component performance criteria used for tenant space are 30% better than a system that is in minimum compliance with ASHRAE/IESNA Standard 90.1-2004. (2 points)

EAc1.4 Optimize Energy Performance, **Equipment & Appliances**

1 – 2 points

Requirements

For all ENERGYSTAR® eligible equipment and appliances installed in the project, including appliances, office equipment, electronics, and commercial food service equipment (but excluding HVAC, lighting, and building envelope products):

- 70%, by rated-power, of ENERGYSTAR eligible equipment and appliances shall be ENERGYSTAR-rated (1 point);

OR

- 90%, by rated-power, of ENERGYSTAR eligible equipment and appliances shall be ENERGYSTAR-rated (2 points).