

BEYOND

SMART CITIES

ENERGY AND ATMOSPHERE - GREEN

BUILDING TECHNOLOGY TRAINING PROGRAM

FOR ENERGY AND GREEN BUILDING SPECIALISTS

KRISHNAJI PAWAR, LEED AP BD+C, GSAS CGP, ISO 14001:2015, GCP

ENERGY SPECIALIST CURRICULUM

ENERGY EFFICIENCY SPECIALIST

BEYOND SMART CITIES

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MINIMUM ENERGY PERFORMANCE -

PREREQUISITE - 2

FOR ENERGY AND GREEN BUILDING PROFESSIONALS

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LEARNING OBJECTIVES



Intent of Minimum Energy Performance - Prerequisite

Behind the intent

Step by Step Guidance

Requirements

Required Documentation

Referenced Standards

Connection to Ongoing Building Performance

Terms and definitions

REQUIREMENTS

Comply with ANSI/ASHRAE/IESNA Standard 90.1-2016, with errata or a USGBC-approved equivalent standard.

ASHRAE 90.1-2016 Compliance pathways in Section 4.2.1.1 include compliance with all mandatory provisions, and compliance with one of the following:

✓Prescriptive provisions of Sections 5 through 10

✓Section 11 Energy Cost Budget Method

✓Normative Appendix G Performance Rating Method.

When using Appendix G, the Performance Cost Index (PCI) shall be less than or equal to the Performance Cost Index Target (PCIt) in accordance with the methodology provided in Section 4.2.1.1. Document the PCI, PCIt, and percentage improvement using metrics of cost or greenhouse gas (GHG) emissions.g:

REQUIREMENTS +

✓For projects using Normative Appendix G Performance Rating Method:
Greenhouse gas emissions : The total green house gas emissions , in terms of carbon dioxide equivalents, shall be calculated for the baseline building performance rating and for the proposed building performance rating, and the percentage improvement shall be determined using carbon dioxide equivalent emissions.

ISO 52000-1:2017: Greenhouse gas emission factors for each building energy source shall be determined consistently with ISO Standard 52000-1:2017 and published for the country or region where the project is located

REQUIREMENTS +

✓Exception to Mandatory Measures requirements : For ASHRAE90.1 2016 mandatory controls provisions that are quantified in the Appendix G Performance Rating Method, (e.g. lighting occupancy sensor controls, lighting daylighting controls, automated receptacle controls, etc.), projects may model the Proposed Building Performance control parameters identically to the Baseline Building Performance control parameters in lieu of compliance with the mandatory provisions.

✓Exceptional Calculations modeled in accordance with Section G 2.5 may be modeled to document minimum prerequisite compliance.

✓Only on-site or on campus renewable energy that meets ASHRAE Standard 90.1-2016 SectionG 2.4.1 requirements for on-site renewable energy may be used to meet minimum ASHRAE Standard 90.1-2016 performance requirements.

REQUIRED DOCUMENTATION

Documentation	Option 1	Option 2	Option 3
Appendix G energy modeling inputs	X		
Input-output reports from modeling software	X		
Exceptional calculations (if applicable)	X		
Energy consumption and demand for each building end use and fuel type	X		
Fuels rates	X		
AEDG compliance tables		X	
Target Finder results, summary			X
Confirmation that all aspects of CPG Sections 1 and 2 were met			X
Building configuration analysis			X
Building loads and mechanical system design capacity			X
Insulation installation details			X
Building envelope details			X
Domestic hot water efficiency			X
Narrative or calculations for CPG enhanced performance strategies			X
Data center calculator (if applicable)	X		
Retail process energy calculator (if applicable)	X		



REFERENCED STANDARDS

✓ASHRAE 90.1-2016

✓ASHRAE 209, 2018 ANSI/ASHRAE/IES

✓Standard 90.12016 Performance Rating

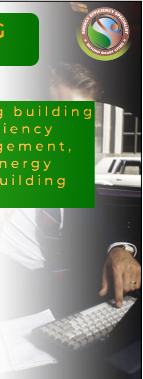
✓Method ReferenceManual,PNNL 2017

✓Developing Performance Cost Index Targets for ASHRAE Standard 90.1 Appendix G - Performance Rating Method



CONNECTION TO ONGOING BUILDING PERFORMANCE

LEED O+M EA credit Energy Performance: Designing building systems to achieve a minimum level of energy efficiency provides the foundation for effective energy management, reduced greenhouse gas emissions from building energy use, and reduced operating costs throughout the building life cycle.





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THANK YOU

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