World Population is estimated to be 6,000,000,000 people

U.S. Population is estimated to be 3,000,000 people

U.S. makes up 5% of the world population

…and uses 25% of the world's energy!
84% of all energy is from fossil fuels

Production of useful energy results in release of CO$_2$ and greenhouse gases into the atmosphere
ESTIMATED THAT 40% OF ENERGY USE GOES TOWARDS OPERATIONS OF BUILDINGS

“It’s a program on conserving energy”
2004 Energy Use in the United States

- Commercial: 17%
- Residential: 23%
- Transportation: 28%
- Industrial: 32%
American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

ASHRAE 90.1

Energy Standard for Buildings Except Low-Rise Residential Buildings
CHAPTER 13

ENERGY EFFICIENCY

SECTION 1301

GENERAL

1301.1 Scope. This chapter governs the design and construction of buildings for energy efficiency.

1301.1.1 Criteria. Buildings shall be designed and constructed in accordance with the applicable provisions of the “International Energy Conservation Code” or the requirements of “ASHRAE 90.1” listed in Chapter 35 of this code.

HISTORY: Eff. 7-1-07
Prerequisites for LEED Certification include:

• Construction Activity Pollution Prevention
• Fundamental Commissioning of the Building Energy System
• **Minimum Energy Performance (ASHRAE 90.1)**
• Fundamental Refrigerant Management
• Storage & Collection of Recyclables
“The unfortunate truth is that many buildings with great designs fade from green to grey when building operators don’t understand how to realize the full potential of the energy conserving systems they manage.”

“The first direction (of ASHRAE) was to lead the advancement of sustainable building design and operation.”
“...the time has passed when we can shake our head and walk away saying ‘this isn’t my problem.’ Everyday we observe installations and operating practices that are wasting our precious energy and water resources, draining power from the grid, increasing the emissions from our generating plants. Building operating practices that waste energy really are our problem, and they must be addressed.”
Energy Standard for Buildings Except Low-Rise Residential Buildings

I-P Edition

See Appendix F for approval dates by the ASHRAE Standards Committee, the ASHRAE Board of Directors, the IESNA Board of Directors, and the American National Standards Institute.
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ANSI/ASHRAE/IESNA Standard 90.1-2004
Energy Standard for Buildings Except Low-Rise Residential Buildings

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**Normative Appendices (these appendices are normative and part of this standard)**

- **Appendix A**: Rated R-Value of Insulation and Assembly U-Factor, C-Factor, and F-Factor Determinations
- **Appendix B**: Building Envelope Climate Criteria
- **Appendix C**: Methodology for Building Envelope Trade-Off Option in Subsection 5.6
- **Appendix D**: Climatic Data

**Informative Appendices (these appendices are informative and not part of this standard)**

- **Appendix E**: Informative References
- **Appendix F**: Addenda Description Information
- **Appendix G**: Performance Rating Method

## NOTE

When addenda, interpretations, or errata to this standard have been approved, they can be downloaded free of charge from the ASHRAE Web site at http://www.ashrae.org.
Section 1 - Purpose

The purpose of this standard is to provide minimum requirements for the energy-efficient design of buildings except low-rise residential buildings.
Section 2 - Scope

2.1 Minimum Energy-efficient requirements for:

New Buildings and their systems

New Portions of buildings and their systems

New systems and equipment in existing buildings
Section 2 - Scope

2.2 The provisions of this standard apply to:

a. The envelope of the building
b. The following systems and equipment
   a. HVAC systems
   b. Service water heating
   c. Electric power distribution and metering
   d. Electric motors and belt drives
   e. Lighting
Section 3 – Definitions, abbreviations, and Acronyms

It comes down to what the definition of “is” is
Section 4 - Administration and Enforcement

4.1 – General

4.2 – Compliance

  4.2.2 – Compliance Documentation

  4.2.2.1 – Construction Details

  4.2.2.2 – Supplemental Information

Supplemental information necessary to verify compliance with this standard, such as calculations, worksheets, compliance forms, vendor literature, or other data, shall be made available when required by the building official.

COMcheck™
Technical Section
Sections 5 through 10

5. Building Envelope

6. Heating, Ventilating, and Air Conditioning

7. Service Water Heating

8. Power

9. Lighting

10. Other Equipment
Sections 5 through 10 are further divided into thematic subsections, with each subsection number identifying its use:

x.1 General
x.2 Compliance Paths
x.3 Simple Buildings or Systems
x.4 Mandatory Requirements
x.5 Prescriptive Requirements
x.6 Alternative Compliance Path
x.7 Submittals
x.8 Products
Section 5 – Building Envelope

5.1 – General

5.2 – Compliance Paths

5.3 – Simplified Building (Not Used)

5.4 – Mandatory Provisions

5.5 – Prescriptive Requirements

5.6 – Alternative Compliance Paths

5.7 – Submittals

5.8 - Products
Section 5 – Building Envelope

5.1 – General
5.2 – Compliance Paths
5.3 – Simplified Building (Not Used)
5.4 – Mandatory Provisions
5.5 – Prescriptive Requirements
5.6 – Alternative Compliance Paths
5.7 – Submittals
5.8 - Products
5.2 Compliance Paths

5.2.1 Compliance. For the appropriate climate, space-conditioning category, and class of construction, the building envelope shall comply with 5.1, General; 5.4, Mandatory Provisions; 5.7, Submittals; and 5.8, Product Information and Installation Requirements; and either

(a) 5.5, Prescriptive Building Envelope Option, provided that

1. the \textit{vertical fenestration area} does not exceed 50\% of the \textit{gross wall area} for each space-conditioning category and

2. the \textit{skylight fenestration area} does not exceed 5\% of the \textit{gross roof area} for each space-conditioning category, or

(b) 5.6, Building Envelope Trade-Off Option.

5.6.1.3 – Envelope performance factor shall be calculated using the procedures of Normative Appendix C
Normative Appendix C
Methodology for Building Envelope Trade-off Option In Subsection 5.6

C.1 Minimum Information Required
C.2 Output Requirements
C.3 Base Envelope Design Specifications
C.4 Zoning and Building Geometry
C.5 Modeling Assumptions
C.6 Equations for Envelope Trade-Off Calculations

Table D-1 U.S. and U.S. Territory Climate Data
(This normative appendix contains the climatic data necessary to determine building envelope and mechanical requirements)
Section 5 – Building Envelope

5.1 – General
5.2 – Compliance Paths
5.3 – Simplified Building (Not Used)
5.4 – Mandatory Provisions
5.5 – Prescriptive Requirements
5.6 – Alternative Compliance Paths
5.7 – Submittals
5.8 - Products
5.4 – Mandatory Provisions

1. Insulation
2. Fenestrations and Doors
3. Air Leakage
   1. Building Envelope Sealing
   2. Fenestration and Doors
   3. Loading Dock Weatherseals
   4. Vestibules
5.4 – Mandatory Provisions

• Insulation

• Fenestrations and Doors

• Air Leakage
  1. Building Envelope Sealing
  2. Fenestration and Doors
  3. Loading Dock Weatherseals
  4. Vestibules
Table 5.5 prescribes insulation values for Building Envelope Components

Proper installation and protection of insulation materials
Figure 5-K—Slab-on-Grade Installations
| Opaque Elements | Nonresidential | | | Residential | | | | Semiheated | |
|----------------|----------------|---------|---------------|----------------|---------|---------------|---------|
|                | Assembly Max | Insulation Min. R-Value | Assembly Max | Insulation Min. R-Value | Assembly Max | Insulation Min. R-Value |
| **Roofs**      |               |                      |               |                      |               |                      |
| Insulation Entirely above Deck | U-0.063 | R-15.0 ci | U-0.063 | R-15.0 ci | U-0.173 | R-5.0 ci |
| Metal Building  | U-0.065 | R-19.0          | U-0.065 | R-19.0          | U-0.097 | R-10.0          |
| Attic and Other | U-0.034 | R-30.0          | U-0.027 | R-38.0          | U-0.053 | R-19.0          |
| **Walls, Above-Grade** | | | | | | |
| Mass            | U-0.123 | R-7.6 ci        | U-0.090 | R-11.4 ci        | U-0.580 | NR               |
| Metal Building   | U-0.113 | R-13.0          | U-0.057 | R-13.0 + R-13.0 | U-0.123 | R-11.0          |
| Steel-Framed    | U-0.084 | R-13.0 + R-3.8 ci | U-0.064 | R-13.0 + R-7.5 ci | U-0.124 | R-13.0          |
| Wood-Framed and Other | U-0.089 | R-13.0          | U-0.089 | R-13.0          | U-0.089 | R-13.0          |
| **Wall, Below-Grade** | | | | | | |
| Below-Grade Wall | C-1.140 | NR | C-1.140 | NR | C-1.140 | NR |
| **Floors**      |               |                      |               |                      |               |                      |
| Mass            | U-0.087 | R-8.3 ci        | U-0.074 | R-10.4 ci        | U-0.322 | NR               |
| Steel-Joist     | U-0.052 | R-19.0          | U-0.038 | R-30.0          | U-0.069 | R-13.0          |
| Wood-Framed and Other | U-0.033 | R-30.0 | U-0.033 | R-30.0 | U-0.066 | R-13.0 |
| **Slab-On-Grade Floors** | | | | | | |
| Unheated        | F-0.730 | NR | F-0.730 | NR | F-0.730 | NR |
| Heated          | F-0.840 | R-10 for 36 in. | F-0.840 | R-10 for 36 in. | F-1.020 | R-7.5 for 12 in. |
| **Opaque Doors** |               |                      |               |                      |               |                      |
| Swinging        | U-0.700 |              | U-0.700 |              | U-0.700 |              |
| Non-Swinging    | U-1.450 |              | U-0.500 |              | U-1.450 |              |
(This is a normative appendix and is part of this standard.)

NORMATIVE APPENDIX A

RATED R-VALUE OF INSULATION AND ASSEMBLY U-FACTOR, C-FACTOR, AND F-FACTOR DETERMINATIONS
NORMATIVE APPENDIX A

Roofs
- Metal Building Roofs
- Attic Roofs with Wood Joists
- Attic Roofs with Steel Joists

Above-Grade Walls
- Mass Walls
- Metal Building Walls
- Steel-Framed Walls
- Wood-Framed Walls

Below-Grade Walls

Floors
- Slab-on-Grade Floors

Opaque Doors

Fenestration
5.4 – Mandatory Provisions

- Insulation
- Fenestrations and Doors
- Air Leakage
  1. Building Envelope Sealing
  2. Fenestration and Doors
  3. Loading Dock Weatherseals
  4. Vestibules
Fenestrations and Doors

Three fenestration performance characteristics required:

U-Factor

Solar Heat Gain Coefficient

Visible Light Transmittance
5.4 – Mandatory Provisions

• Insulation
• Fenestrations and Doors
• Air Leakage
  1. Building Envelope Sealing
  2. Fenestration and Doors
  3. Loading Dock Weatherseals
  4. Vestibules
5.4.3 Air Leakage

1. Building Envelope Sealing
2. Fenestration and Doors
3. Loading Dock Weatherseals
4. Vestibules
Section 5 – Building Envelope

5.1 – General
5.2 – Compliance Paths
5.3 – Simplified Building (Not Used)
5.4 – Mandatory Provisions
5.5 – Prescriptive Requirements
5.6 – Alternative Compliance Paths
5.7 – Submittals
5.8 - Products
Section 6 – Heating, Ventilating, and Air Conditioning

6.1 – General
6.2 – Compliance Paths
6.3 – Simplified Approach
6.4 – Mandatory Provisions
6.5 – Prescriptive Requirements
6.6 – Alternative Compliance Paths (Not Used)
6.7 – Submittals
6.8 - Products
Section 6 – Heating, Ventilating, and Air Conditioning

6.1 – General
6.2 – Compliance Paths
6.3 – Simplified Approach
6.4 – Mandatory Provisions
6.5 – Prescriptive Requirements
6.6 – Alternative Compliance Paths (Not Used)
6.7 – Submittals
6.8 - Products
6.1 General

6.1.1 Scope

New Buildings
Additions to Existing Buildings
Alterations to HVAC in Existing Buildings
Section 6 – Heating, Ventilating, and Air Conditioning

6.1 – General
6.2 – Compliance Paths
6.3 – Simplified Approach
6.4 – Mandatory Provisions
6.5 – Prescriptive Requirements
6.6 – Alternative Compliance Paths (Not Used)
6.7 – Submittals
6.8 - Products
6.2 Compliance Path

Compliance with Section 6 shall be achieved by meeting all requirements for 6.1, General; 6.7 Submittals, 6.8 Minimum Equipment Efficiency; and either

a. 6.3 - Simplified Approach
b. 6.4 – Mandatory Provisions AND 6.5 – Prescriptive Path
Section 6 – Heating, Ventilating, and Air Conditioning

6.1 – General
6.2 – Compliance Paths
6.3 – Simplified Approach
6.4 – Mandatory Provisions
6.5 – Prescriptive Requirements
6.6 – Alternative Compliance Paths (Not Used)
6.7 – Submittals
6.8 - Products
6.3 – Simplified Approach
6.3 – Simplified Approach

Building is two stories or less

Gross Floor Area is less than 25,000 square feet, and

Each HVAC system in the building complies criteria outlined in Section 6.3.2
Section 6 – Heating, Ventilating, and Air Conditioning

6.1 – General

6.2 – Compliance Paths

6.3 – Simplified Approach

6.4 – Mandatory Provisions

6.5 – Prescriptive Requirements

6.6 – Alternative Compliance Paths (Not Used)

6.7 – Submittals

6.8 - Products
6.4 – Mandatory Provisions

1. Equipment Efficiencies, Verification and Labeling Requirements
2. Required Load Calculations
3. Controls
4. HVAC System Construction and Insulation
6.4.1 Equipment Efficiencies, Verification and Labeling Requirements

Mechanical equipment is required to have minimum performance ratings per the following tables:

6.8.1A – Air Conditioners and Condensing Units
6.8.1B – Heat Pumps
6.8.1C – Water Chilling Packages
6.8.1D – Packaged Terminal and Room A/C and Heat Pumps
6.8.1E – Furnaces, Duct Furnaces, and Unit Heaters
6.8.1F – Boilers
6.8.1G – Heat Rejection Equipment
6.4.2 Required Load Calculations

“Heating and cooling systems design loads for the purpose of sizing systems and equipment shall be determined in accordance with generally accepted engineering standards and handbooks acceptable to the adopting authority (for example, ASHRAE Handbook – Fundamentals)”
6.4.3. Controls

1. Zone Thermostatic Controls
2. Setpoint Overlap Restrictions
3. Off-Hour Controls
4. Ventilation System Controls
5. Heat Pump Auxiliary Heat Control
6. Humidifier Preheat
7. Humidification and Dehumidification
8. Freeze Protection and Snow/Ice Melting Systems
9. Ventilation Controls for High-Occupancy Areas
6.4.4. HVAC System Construction and Insulation

Insulation
   Duct and plenum Insulation
   Piping Insulation

Ducts and Plenum Leakage

Completion Requirements
   Drawings and Manuals
Section 6 – Heating, Ventilating, and Air Conditioning

6.1 – General
6.2 – Compliance Paths
6.3 – Simplified Approach
6.4 – Mandatory Provisions
6.5 – Prescriptive Requirements
6.6 – Alternative Compliance Paths (Not Used)
6.7 – Submittals
6.8 - Products
6.5 – Prescriptive Requirements

Economizers
- Air Economizers; Water Economizers;
- Integrated Economizer Control;
- Economizer Heating System Impact

Simultaneous Heating and Cooling Limitations
- Zone Controls; Hydronic System Controls;
- Dehumidification; Humidification

Air System Design and Control

Hydronic System Design and Control

Heat Rejection Equipment
Section 7 – Service Water Heating

7.1 – General
7.2 – Compliance Paths
7.3 – Simplified Option (Not Used)
7.4 – Mandatory Provisions
7.5 – Prescriptive Requirements
7.6 – Alternative Compliance Paths (Not Used)
7.7 – Submittals
7.8 – Products
Section 7 – Service Water Heating

7.1 – General
7.2 – Compliance Paths
7.3 – Simplified Option (Not Used)
7.4 – Mandatory Provisions
7.5 – Prescriptive Requirements
7.6 – Alternative Compliance Paths (Not Used)
7.7 – Submittals
7.8 – Products
7.1 General

7.1.1 Scope

New Buildings

Additions to Existing Buildings

Exception – When an addition to a building utilizes an existing service, compliance with this standard is not required. However, any new systems must comply.

Alterations to HVAC in Existing Buildings

Exception – When there is insufficient space or access to meet these requirements.
Section 7 – Service Water Heating

7.1 – General

7.2 – Compliance Paths

7.3 – Simplified Option (Not Used)

7.4 – Mandatory Provisions

7.5 – Prescriptive Requirements

7.6 – Alternative Compliance Paths (Not Used)

7.7 – Submittals

7.8 – Products
7.2 – Compliance Paths

7.2.1 – Compliance shall be achieved by meeting the requirements of 7.1, General; 7.4, Mandatory Provisions; 7.5, Prescriptive Path; 7.7, Submittals; and 7.8, Product Information

7.2.2 – Projects using the Energy Cost Budget Method (Section 11) for demonstrating compliance with the standard shall meet the requirements of 7.4, Mandatory Provisions, in conjunction with Section 11.
Section 7 – Service Water Heating

7.1 – General
7.2 – Compliance Paths
7.3 – Simplified Option (Not Used)
7.4 – Mandatory Provisions
7.5 – Prescriptive Requirements
7.6 – Alternative Compliance Paths (Not Used)
7.7 – Submittals
7.8 – Products
7.4 – Mandatory Provisions

1. Load Calculations
   
   Based on manufacturer’s published sizing guidelines, or
   
   Generally accepted engineering standards (e.g., ASHRAE Handbook – HVAC Applications)

   • Equipment Efficiency (Criteria listed in Table 7.8)
   • Piping Insulation requirements
   • System Controls
   • Pools
   • Heat Traps
Section 7 – Service Water Heating

7.1 – General
7.2 – Compliance Paths
7.3 – Simplified Option (Not Used)
7.4 – Mandatory Provisions
7.5 – Prescriptive Requirements
7.6 – Alternative Compliance Paths (Not Used)
7.7 – Submittals
7.8 – Products
Section 8 – Power

8.1 – General
8.2 – Compliance Paths
8.3 – Simplified Option (Not Used)
8.4 – Mandatory Provisions
8.5 – Prescriptive Requirements
8.6 – Alternative Compliance Paths (Not Used)
8.7 – Submittals
8.8 – Products
Section 8 – Power

8.1 – General
8.2 – Compliance Paths
8.3 – Simplified Option (Not Used)
8.4 – Mandatory Provisions
8.5 – Prescriptive Requirements
8.6 – Alternative Compliance Paths (Not Used)
8.7 – Submittals
8.8 – Products
Section 9 – Lighting

9.1 – General
9.2 – Compliance Paths
9.3 – Simplified Option (not used)
9.4 – Mandatory Provisions
9.5 – Building Area Method Compliance Path
9.6 – Alternative Compliance Path - Space by Space Method
9.7 – Submittals (not used)
9.8 – Product Information (not used)
Section 9 – Lighting

9.1 – General
9.2 – Compliance Paths
9.3 – Simplified Option (not used)
9.4 – Mandatory Provisions
9.5 – Building Area Method Compliance Path
9.6 – Alternative Compliance Path - Space by Space Method
9.7 – Submittals (not used)
9.8 – Product Information (not used)
9.1 – General

1. This section shall apply to the following:
   a. interior spaces of buildings
   b. exterior building features
   c. exterior building grounds

2. Lighting Alterations (replacement of lighting systems)

3. Installed Interior Lighting Power

4. Luminaire Wattage
Section 9 – Lighting

9.1 – General

9.2 – Compliance Paths

9.3 – Simplified Option (not used)

9.4 – Mandatory Provisions

9.5 – Building Area Method Compliance Path

9.6 – Alternative Compliance Path - Space by Space Method

9.7 – Submittals (not used)

9.8 – Product Information (not used)
9.2 – Compliance Paths

1. Lighting systems and equipment shall comply with 9.1, General; 9.4, Mandatory Provisions; and the prescriptive requirements of either:
   a. 9.5, Building Area Method; or
   b. 9.6, Space-by-Space Method
Section 9 – Lighting

9.1 – General
9.2 – Compliance Paths
9.3 – Simplified Option (not used)
9.4 – Mandatory Provisions
9.5 – Building Area Method Compliance Path
9.6 – Alternative Compliance Path - Space by Space Method
9.7 – Submittals (not used)
9.8 – Product Information (not used)
9.4 – Mandatory Provisions

9.4.1 Lighting Controls

Automatic Lighting Shutoff. Interior lighting in buildings larger than 5000 s.f. shall be controlled with an automatic control device to shut off building lighting in all spaces.

A. time of day operated control device

B. Occupant sensor

C. Signal from another control or alarm system
Section 9 – Lighting

9.1 – General
9.2 – Compliance Paths
9.3 – Simplified Option (not used)
9.4 – Mandatory Provisions
9.5 – Building Area Method Compliance Path
9.6 – Alternative Compliance Path - Space by Space Method
9.7 – Submittals (not used)
9.8 – Product Information (not used)
9.5 – Building Area Method Compliance Path

- Determine the appropriate building area type from the table.
- Determine the gross lighted floor area (s.f.) of the building area type.
- Multiply the gross lighted floor areas of the building area types times the lighting power density.
- The interior lighting power allowance for the building is the sum of the lighting power allowances of all building area types. Trade-offs among building area types are permitted provided that the total installed interior lighting power does not exceed the interior lighting power allowance.
## Lighting Power Density
(Using Building Area Method)

<table>
<thead>
<tr>
<th>Building Area Type</th>
<th>W/s.f.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convention Center</td>
<td>1.2</td>
</tr>
<tr>
<td>Dining: Bar Lounge/Leisure</td>
<td>1.3</td>
</tr>
<tr>
<td>Dining: Family</td>
<td>1.6</td>
</tr>
<tr>
<td>Exercise Center</td>
<td>1.0</td>
</tr>
<tr>
<td>Hospital</td>
<td>1.2</td>
</tr>
<tr>
<td>Office</td>
<td>1.0</td>
</tr>
<tr>
<td>Performing Arts Theater</td>
<td>1.6</td>
</tr>
<tr>
<td>Religious Building</td>
<td>1.3</td>
</tr>
<tr>
<td>Retail</td>
<td>1.5</td>
</tr>
</tbody>
</table>
Section 9 – Lighting

9.1 – General
9.2 – Compliance Paths
9.3 – Simplified Option (not used)
9.4 – Mandatory Provisions
9.5 – Building Area Method Compliance Path
9.6 – Alternative Compliance Path - Space by Space Method
9.7 – Submittals (not used)
9.8 – Product Information (not used)
9.6 – Alternative Compliance Path - Space by Space Method

1. Use the following steps to determine the interior lighting power allowance by the space-by-space method
   
a. Determine the appropriate building type

b. For each space enclosed by partitions 80% or greater than ceiling height, determine the gross interior floor area

c. Determine the interior lighting power allowance by using table 9.6.1

d. The interior lighting power allowance is the sum of the allowances of all spaces. Trade-offs among spaces are permitted provided that the total installed interior lighting power does not exceed the interior lighting power allowance.
# Lighting Power Density
(Using Space by Space Method)

<table>
<thead>
<tr>
<th>Common Space Types</th>
<th>W/s.f.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office – Enclosed</td>
<td>1.1</td>
</tr>
<tr>
<td>Office – Open Plan</td>
<td>1.1</td>
</tr>
<tr>
<td>Conference/Meeting</td>
<td>1.3</td>
</tr>
<tr>
<td>Lobby</td>
<td>1.3</td>
</tr>
<tr>
<td>Restrooms</td>
<td>0.9</td>
</tr>
<tr>
<td>Corridor</td>
<td>0.5</td>
</tr>
<tr>
<td>Stairs (Active)</td>
<td>0.6</td>
</tr>
<tr>
<td>Storage</td>
<td>0.6</td>
</tr>
</tbody>
</table>
Section 10 – Other Equipment

10.1 – General
10.2 – Compliance Paths
10.3 – Simplified Option (not used)
10.4 – Mandatory Provisions
10.5 – Prescriptive Compliance Path (not used)
10.6 – Alternative Compliance Path – (not used)
10.7 – Submittals (not used)
10.8 – Product Information
Section 10 – Other Equipment

10.1 – General
10.2 – Compliance Paths
10.3 – Simplified Option (not used)
10.4 – Mandatory Provisions
10.5 – Prescriptive Compliance Path (not used)
10.6 – Alternative Compliance Path – (not used)
10.7 – Submittals (not used)
10.8 – Product Information
10.4 – Mandatory Provisions

Electric motors shall comply with the requirements of the Energy Policy Act of 1992 where applicable, as shown in Table 10.8. Motors that are not included in the scope of the Energy Policy Act of 1992 have no performance requirements in this section.
Energy Cost Budget Method Scope. The building energy cost budget method is an alternative to the prescriptive provisions of this standard. It may be employed for evaluating the compliance of all proposed designs, except designs with no mechanical systems.
Section 11 – Energy Cost Budget Method

Compliance with Section 11 will be achieved if:

b. All requirements of 5.4, 6.4, 7.4, 8.4, 9.4, and 10.4 are met.

c. The design energy cost does not exceed the energy cost budget, as calculated by the simulation program.

d. The energy efficiency level of components specified in the building design meet or exceed the efficiency levels used to calculate the design energy cost.
Section 4 - Administration And Enforcement

4.2.2.1 – Construction Details
4.2.2.2 – Supplemental Information

Supplemental information necessary to verify compliance with this standard, such as calculations, worksheets, compliance forms, vendor literature, or other data, shall be made available when required by the building official.
DOE's Building Energy Codes Program is an information resource on national model energy codes. We work with other government agencies, state and local jurisdictions, national code organizations, and industry to promote stronger building energy codes and help states adopt, implement, and enforce those codes.

The Program recognizes that energy codes maximize energy efficiency only when they are fully embraced by users and supported through education, implementation, and enforcement.

Free Software

REScheck
REScheck, REScheck-Web, REScheck Package Generator

COMcheck
COMcheck, COMcheck-Web, COMcheck Package Generator

Technical Support

Resource Center
Where are we going in the future?

90.1 – 2010 – Will required 30% less energy usage that 2004

90.1-2020 will have guidance for net-zero site energy usage.

CAP & TRADE Policies
Positive proof of global warming.

Questions?