Overview of the 2018 IECC for Montana

Commercial Codes Training
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Montana

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Overview of the code adoption process in Montana

Key changes going from 2012 to 2018 IECC for commercial buildings

Discussion topics for the audience
Public/Stakeholder Input

Opportunity

Overview of the Code Adoption Process in Montana

Model Code Published- various sources, code entities-documents serve as starting or base documents

Department may seek help from industry groups (Input Opportunity)

- Background Analysis performed by the Department to gauge changes and impacts to Montana
- Department actively seeks Stakeholder input through stakeholder meetings- Public and written testimony taken

Public/Stakeholder Opportunity

Department Summarizes public input from stakeholder meetings prepares findings for Building Codes Council

Department seeks to evaluate codes for: Standards of safety, design & fire prevention Economic Considerations Use of modern practices, methods, materials Uniform application of the codes

Public/Stakeholder Opportunity

Building Codes Advisory Council meets to take public testimony, craft and establish code proposals

Industry Representatives on Council

Montana Architect
Montana Engineer
Building Contractor
Building Inspector
Manufactured Housing Public Member
Montana Electrician
Montana Plumber
Elevator Mechanic
Home Builder
State Fire Marshall
Director DPHHS

Public/Stakeholder Opportunity

Department documents action of Building Codes Council-prepares Rules Proposal

MAPA Process Followed

Public/Stakeholder Opportunity

Rules Hearing Process

Local Certified Government Building Code Jurisdiction have an additional 90 days to adopt same codes/same modification

Public/Stakeholder Participation Opportunity

Codes Adoptions-Department provides substantial training opportunities on new code provisions for stakeholders
Overview of the changes in 2018 IECC

Key changes going from 2012 to 2018 IECC for commercial buildings

- Mechanical provisions reorganized based on equipment type rather than design methodology. (Section C403)
  - New limits on heated or cooled vestibules. (Section C403.4.1.4)
  - Demand control ventilation becomes mandatory (Section C403.7.1)

- Revisions to interior and exterior lighting power budgets and better clarity for lighting controls. (Section C405)

- Additional sections for efficiency package options. (Section C407)

- Clarity that regardless of design methodology, system commissioning is required. (Section C408)

- Provisions for solar ready building (Appendix CA)
Overview of the changes in 2018 IECC

Compliance Path Options for the IECC 2012 – Commercial

1. 90.1-2010

2. C402 - Envelope
   C403 - Mechanical
   C404 - SWH
   C405 - Lighting
   AND

   Pick One:
   C406.2 – Eff. HVAC Performance
   OR
   C406.3 – Eff. Lighting Systems
   OR
   C406.4 – On-site Renewable Energy

3. C407 – Total Building Performance
   C402.4 – Air Leakage
   C403.2 – Provisions applicable to all mechanical systems
   C404 - SWH
   Lighting Mandatory Sections
   C405.2
   C405.3
   C405.4
   C405.6
   C405.7
   Building energy cost to be ≤ 85% of standard reference design building

Overview of the changes in 2018 IECC

Compliance Path Options for the IECC 2018 – Commercial

1. ASHRAE 90.1-2016
2. 2018 IECC - Prescriptive
   - C402 - Envelope
   - C403 - Mechanical
   - C404 - SWH
   - C405 - Lighting
   - AND
   - Pick At Least One C406:
     - C406.2 – Eff. HVAC Performance
     - C406.3 – Reduced Lighting Power
     - C406.4 – Enhanced Lighting Controls
     - C406.5 – On-site Supply of Renewable energy
     - C406.6 – Dedicated Outdoor Air System
3. 2018 IECC - Performance
   - C407 – Total Building Performance
   - C402.5 – Air Leakage
   - C403.2 – Provisions applicable to all mechanical systems
   - C404 - SWH
   - Lighting Mandatory Sections
     - C405.2
     - C405.3
     - C405.4
     - C405.6
   - Building energy cost to be ≤ 85% of standard reference design building

https://www.energycodes.gov/sites/default/files/becu/2012iecc_commercial_envelope_BECU.pdf
SECTION C403 Building Mechanical Systems

- Major reorganization of the mechanical section

- Rather than separate mandatory & prescriptive sections, requirements are now grouped by section group:
  - Similar requirements were brought together
  - Mandatory requirements were indicated for each section.
  - Sections without the ‘Mandatory’ designation are prescriptive

- As a results, familiar section numbers have changed

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**Mechanical sub-sections in the 2018 IECC:**

- C403.1: General ( Loads)
- C403.2: System Design
- C403.3: Equipment
- C403.4: HVAC Controls
- C403.5: Economizers
- C403.6: Multi-zone/VAV
- C403.7: Vent & Exhaust
- C403.8: Fan Eff. & Cntrl.
- C403.9: Heat Rejection
- C403.10: Refrigeration
- C403.11: Construction
- C403.12: Outside Bldg.
SECTION C403 Building Mechanical Systems

- Section C403.4.1.4 Heated or Cooled Vestibules (Mandatory)
  - Heating system for heated vestibules and air curtains with integral heating—
    Controls configured to shut off heat when outdoor air temperature is > 45°F
  - Heating and cooling systems controlled by thermostat in vestibule configured to
    limit heating to < 60°F and cooling to > 85°F

(Exception: control of heating or cooling provided by
- Site-recovered energy or
- Transfer air that would otherwise be exhausted)
SECTION C403 Building Mechanical Systems

- Section C403.7.1 Demand control ventilation (Mandatory)

  - DCV must be provided for each zone with spaces > 500 ft² and the average occupant load > 25 people / 1000 ft² of the floor area where HVAC system has either a:
    - Airside economizer
    - Automatic modulating control of the OA damper
    - A design OA flow > 3000 CFM
SECTION C405 Electrical Power and Lighting Systems

- Mandatory interior lighting requirements
  - Required controls
  - Wattage / efficiency limits

- Interior lighting power allowances

- Exterior lighting controls
  - Required controls
  - Lamp efficiency

- Exterior lighting power allowances

- Electric metering
  - Transformers
  - Motors
  - Transportation systems
  - Voltage drop feeders
  - Branch circuits
SECTION C406 Additional Efficiency Package Options

- More efficient lighting system – improved LPD
- More efficient HVAC system by 10%
- Installation of on-site renewables
- Digital lighting controls
- Dedicated outdoor air system
- Reduced energy use in SWH
- Enhanced envelope performance
- Reduced air infiltration
SECTION C408 Maintenance Information & System Commissioning

- HVAC commissioning applied to buildings with equipment capacity greater than:
  - 480,000 Btu/h cooling
  - 600,000 Btu/h heating & water heating

- Lighting commissioning is mandatory

- Requirements for O&M information

- Requirement for commissioning compliance checklist for preliminary commissioning report

**Checklist:**
- Commissioning plan
- Systems adjustment & balancing
- Functional performance
  - Equipment
  - Controls
  - Economizers
- Preliminary commissioning report
- Construction documents & O&M manuals
- Final commissioning report & air balancing report
CHAPTER 5: EXISTING BUILDING

- Requirements for building renovations, alterations, repair and occupancy change to comply with parts of Chapter 4 in the code

- Compliance requirements with parts of Chapter 4: Energy Efficiency

- Section C503.6 Lighting systems
  - New lighting systems that are a part of the alteration shall comply with Section C405
  - Exception. Alterations that replace less than 10% of the luminaires in a space provided that such alterations do not increase the increased lighting power
Overview of the changes in 2018 IECC

APPENDIX CA Solar-ready Zone - Commercial

- Requirement of a solar ready zone
  - Minimum roof area for solar
  - Roof loads & documentation
  - Interconnection pathway
  - Electrical service reserved space
  - Construction documentation certificate

Solar panels on NAIH – Largest solar installation in Montana

Solar panels on the City Life Community Center, Missoula Montana
QUESTION 1
Are there particular provisions in the code that are difficult to adopt in the industry?
▪ Are requirements for commissioning too stringent?
▪ Is there a resistance to adherence for EEMs?
▪ Other topics you may wish to discuss...
QUESTION 2
Are the jurisdictional enforcement consistent across the state?
- Stories
- Problems
- Solutions
QUESTION 3
Are there any high-performance technologies that was not covered in this presentation?

- High performance technologies that have worked well in the state
QUESTION 4
Are there tools, educational & outreach programs, that currently assist you with compliance?
Energy Code Collaborative

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All slides are available online at:

www.ncat.org/energy-code-trainings/
THANK YOU