Energy Codes Role in High Performance Buildings

- The minimum (optimum) level of energy efficiency required by law, or
- Stay out of the way and don’t create barriers, or
Where We Are
with Code Provisions that Support
High Performance Buildings

• IRC Provisions
  – Unvented attics
  – Conditioned crawlspaces
  – Framing reduction
  – ACCA Manual D
  – Mechanical ventilation
  – Insulate under radiant floors

• IECC Provisions
  – Insulation installation and air leakage
  – Envelope leakage testing
  – Duct leakage testing
  – ACCA Manual J and S
  – Solar ready
What Did We Add in 2018 IECC to Support High Performance Buildings?

IECC - Residential
IRC - Energy

2016 GROUP B COMMITTEE ACTION HEARINGS

APRIL 17, 2016 – APRIL 27, 2016
KENTUCKY INTERNATIONAL CONVENTION CENTER
LOUISVILLE, KY
Air Sealing and Insulation Installation Table

• Requires supply and return register boots to be sealed to the subfloor or drywall
• Requires recessed lights to be sealed to the finished surface
• Requires spaces behind electrical/phone boxes to be insulated
## Table R402.1.2 Insulation and Fenestration Requirements by Component

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>2015 Glazing U-factor</th>
<th>2018 Glazing U-factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>2</td>
<td>0.40</td>
<td>0.40</td>
</tr>
<tr>
<td>3</td>
<td>0.35</td>
<td>0.32</td>
</tr>
<tr>
<td>4</td>
<td>0.32</td>
<td>0.32</td>
</tr>
<tr>
<td>5</td>
<td>0.32</td>
<td>0.30</td>
</tr>
<tr>
<td>6</td>
<td>0.32</td>
<td>0.30</td>
</tr>
<tr>
<td>7</td>
<td>0.32</td>
<td>0.30</td>
</tr>
<tr>
<td>8</td>
<td>0.32</td>
<td>0.30</td>
</tr>
</tbody>
</table>
RESNET/ICC 380-2016 for Building Envelope Testing


• Provides clear guidance on how to conduct an envelope air leakage test
• Standard will be used by all HERS raters in the industry
• Standard 380 allows for single point test In addition to multipoint as required by ASTM E 779
Ductwork

• Allows for ductwork to be buried in insulation
# Fan Efficacy

**TABLE R403.6.1 (N1103.6.1)**

**WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY**

<table>
<thead>
<tr>
<th>FAN LOCATION</th>
<th>AIR FLOW RATE MINIMUM (CFM)</th>
<th>MINIMUM EFFICIENCY (CFM/WATT)</th>
<th>AIR FLOW RATE MAXIMUM (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRV or ERV</td>
<td>Any</td>
<td>1.2 cfm/watt</td>
<td>Any</td>
</tr>
<tr>
<td>Range hoods</td>
<td>Any</td>
<td>2.8 cfm/watt</td>
<td>Any</td>
</tr>
<tr>
<td>In-line fan</td>
<td>Any</td>
<td>2.8 cfm/watt</td>
<td>Any</td>
</tr>
<tr>
<td>Bathroom, utility room</td>
<td>10</td>
<td>1.4 cfm/watt</td>
<td>&lt; 90</td>
</tr>
<tr>
<td>Bathroom, utility room</td>
<td>90</td>
<td>2.8 cfm/watt</td>
<td>Any</td>
</tr>
</tbody>
</table>

For SI: 1 cfm = 28.3 L/min.
ERI Approach and Renewables

- 2015 “backstop” if taking credit for renewables
- 2009 “backstop” if not taking credit for renewables
- Increased ERI scores

### 2018 IECC ERI Scores

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>2018 ERI Score</th>
<th>2015 ERI Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 2</td>
<td>57</td>
<td>52</td>
</tr>
<tr>
<td>3</td>
<td>57</td>
<td>51</td>
</tr>
<tr>
<td>4</td>
<td>62</td>
<td>54</td>
</tr>
<tr>
<td>5</td>
<td>61</td>
<td>55</td>
</tr>
<tr>
<td>6</td>
<td>61</td>
<td>54</td>
</tr>
<tr>
<td>7-8</td>
<td>58</td>
<td>53</td>
</tr>
</tbody>
</table>
ERI Approach and ANSI/RESNET/ICC 301-2014

- RESNET/ICC 301 as a basis for the ERI approach
  - Gives credit for on-site power production
  - Defines renewables
    - Solar energy
    - Wind energy
    - Biomass
Lighting Equipment (Prescriptive)

- A minimum of 90 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps.
Where Do I Think That We Are Going?

[Graph showing Residential Code Improvement with energy use index (EUI) on the y-axis and years from 1970 to 2020 on the x-axis. Key points marked for 2006, 2009, 2012, and 2015 IECC codes.]
Code Development Process Theory
Code Development Process Reality
Where Do I Think That We Are Going?

• Short Term
  – Focus on better compliance with energy codes
  – Focus on increasing quality of construction practices
  – Reflect innovative construction practices that can save energy
Where Do I Think That We Are Going?
Long Term

Energy Use

ZNE

Years ????
Driven by Market Pull Activities

Source: Northeast Energy Efficiency Partnership
Eric Makela
Senior Associate
(208) 629-1447
Eric.Makela@Cadmusgroup.com

Facebook.com/CadmusGroup
@CadmusGroup
Linkedin.com/company/the-cadmus-group