Minutes for Energy Code Stakeholder Meeting
November 4, 2019 9:00 a.m. to 11:00 a.m.
Energy & Environment Commission Room, 5301 Northshore Drive, North Little Rock, AR

Introduced Bourke Reeve from Three Points Planning; Tim Quetsch, Mitchell Simpson, Tim Scott, Ryan Burris (all from Arkansas Energy Office).

Attendees:

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allin Crawford</td>
<td>Natural State Retrofoam</td>
</tr>
<tr>
<td>Andy Wilson</td>
<td>City of Sherwood</td>
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<tr>
<td>Beau Blankenship</td>
<td>Entergy Arkansas</td>
</tr>
<tr>
<td>Bob Higginbottom</td>
<td>AR Dept of Health</td>
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<tr>
<td>Bourke Reeve</td>
<td>Three Points Planning</td>
</tr>
<tr>
<td>Eric Ward</td>
<td>Home Builders Association</td>
</tr>
<tr>
<td>Jordan Wimpy</td>
<td>Mitchell Williams Law</td>
</tr>
<tr>
<td>Katie Niebaum</td>
<td>Arkansas Advanced Energy Association</td>
</tr>
<tr>
<td>Keith Wingfield</td>
<td>AR Home Builders Association</td>
</tr>
<tr>
<td>Kirk Pierce</td>
<td>Centerpoint Energy</td>
</tr>
<tr>
<td>Lindsay Moore</td>
<td>AR Dept of Labor and Licensing</td>
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<tr>
<td>Mark Allison</td>
<td>DDH</td>
</tr>
<tr>
<td>Mitch Ross</td>
<td>AR Electric Coop</td>
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<tr>
<td>Mitchell Simpson</td>
<td>AEO</td>
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<tr>
<td>Rick Mayhan</td>
<td>AR Dept of Health</td>
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<tr>
<td>Ron Hughes</td>
<td>HERS Inc</td>
</tr>
<tr>
<td>Ryan Burris</td>
<td>AEO</td>
</tr>
<tr>
<td>Santiago Asimbaya</td>
<td>Entergy Arkansas</td>
</tr>
<tr>
<td>Stuart Spencer</td>
<td>Mitchell Williams Law</td>
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<tr>
<td>Tim Quetsch</td>
<td>AEO</td>
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<tr>
<td>Tim Scott</td>
<td>AEO</td>
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<tr>
<td>Tom Hunt</td>
<td>HVACR Association</td>
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<tr>
<td>Tony Woodard</td>
<td>Dept of Labor and Licensing</td>
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<tr>
<td>Via webinar:</td>
<td></td>
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<tr>
<td>Jeff Dangeau</td>
<td>Black Hills Energy</td>
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<tr>
<td>Jacob Nielson</td>
<td>CLEAResult</td>
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Topics covered in presentation (attached):
1. Arkansas Update Process
2. Energy Code Background
   a. Commercial Buildings
   b. Residential Buildings
   c. Arkansas Residential Performance
   d. Compliance Options
3. Next Steps
4. Additional Resources
Announced 2018 International Energy Conservation Code as the model to utilize as a starting draft for Arkansas Supplements and Amendments. Arkansas Energy Office (AEO) requests stakeholders provide suggested revisions to this 2018 model code. Comments can be sent to energyinfo@adeq.state.ar.us.

The stakeholder feedback process and workgroup meetings will continue into 2020. The focus will be to complete a new draft of the Arkansas Energy Code ready for legislative approval, and identify training and outreach methods to enhance awareness and compliance. Stakeholders are the experts in the energy and building industries, and AEO looks to them to identify the important areas of the code.

Arkansas Residential Field Study: Data from a 2015 field study in Arkansas was summarized to give a picture of the current building industry practices relevant to Arkansas energy codes. The full detailed report can be found at https://www.energycodes.gov/sites/default/files/documents/Arkansas_Residential_Field_Study.pdf.

Group Discussion Points:
- Accessibility of Arkansas Energy Code: There is confusion on what the current state code is and how to find a copy of it. Likewise moving forward, how can stakeholders access the new code for review and comment purposes, and copies made accessible statewide without infringing on ICC copyrights?
- Clarification of the term “model code”: model means the published national standard code, from a specific version year of the International Code Council (ICC), ASHRAE, or other standards organizations. Like many states, Arkansas traditionally modifies a “model code” and adopts it as the state code.
- Emphasized importance of coordination between state agencies (Energy Office, Fire Marshall, Health Department, Labor and Licensing) to prevent conflicting or superseded code provisions in their respective building code sections.
- Requested powerpoint slides and ongoing stakeholder information be shared via an easy-to-use website for effective community participation in code updates.
- Need to examine further: natural ventilation and mechanical ventilation requirements, including ICC and ASHRAE codes
- Outreach and training: Statewide awareness and enforcement is a challenge. Not all homes are being built to the same standard. Not all areas of the state have a building department or a capacity to inspect and enforce energy codes. Consumers are unaware that two homes built in the same year may not have the same energy efficiency, and the average person doesn’t understand what it takes to meet the code or be energy efficient.
- Outreach and training: Suggested creating a simplified guide to the energy code requirements, for easy distribution and use by designers, builders, contractors, or inspectors. This could also complement initial and ongoing code trainings.

AEO will host the next stakeholder meeting in first quarter 2020.
Updates to the Arkansas Energy Code
Based on the International Energy Conservation Code
Arkansas Energy Office
Arkansas Energy Office

Introductions

- energyinfo@adeq.state.ar.us
- Tim Quetsch, Engineer
  - 501-548-4651
  - Tim.Quetsch@adeq.state.ar.us
- Ryan Burris, Training Project Manager
  - 501-682-0976
  - Ryan.burris@adeq.state.ar.us
- Tim Scott, Outreach and Training Manager
  - 501-682-2433
  - Scott@adeq.state.ar.us
Three Points Planning
Introductions

• Bourke Reeve, Facilitator
  – bourke.reeve@threepointsplanning.com
Topics Covered

1. Arkansas Update Process
2. Energy Codes Background
   I. Commercial Buildings
   II. Residential Buildings
   III. Arkansas Residential Performance
   IV. Compliance Options
3. Next Steps
4. Additional Resources
Update Process: Step 1

Select model code version for beginning Arkansas Amendments

- 2018 IEC C
  - Commercial includes 2016 ASHRAE 90.1
  - Significant energy improvements and dollar savings over existing Arkansas Energy Code
Update Process: Step 2

Feedback, Amendments, and Arkansas Supplements

• **ACTION for Stakeholders:**
  – Provide revisions and comments to AEO
  – Form subcommittees on topics
  – Suggest Arkansas Supplements and Amendments to IECC standard
  – [energyinfo@adeq.state.ar.us](mailto:energyinfo@adeq.state.ar.us)
Update Process: Step 2 (continued)

- AEO has identified some hot topics for review
- Anticipate breaking into subgroups to refine amendments
- A series of Stakeholder Workgroup Meetings continuing in 2020
Update Process: Future Steps

5. AEO files proposed rule with Legislative Council. 30 day Public Comment period begins. (2020)
6. Legislative Subcommittee Review for Approval (2021)
7. Training and Outreach (2021)
7. Code Implementation (2022)
Timeline

- Gather Stakeholder Groups (2019)
  - Edits, feedback, and discussion

- Draft ready for Public Comment (2020)
  - Edits, Feedback, and Discussion
  - Impact study

- Legislative Committee Review (2020-2021)
  - Official Review and Public Comment
  - Revisions

- Code is Adopted (2021)
  - Outreach and training

- Code goes into Effect (2022)
  - Implement

Code goes into Effect (2022)
Why Update?

- Outdated code
- Declining software support
- FEMA disaster recovery assistance
- FHA mortgage qualification
- Consumer expectation and local interest
- Health and safety
Energy Codes Background

- “IECC” – International Energy Conservation Code
  - Updated every 3 years
  - International Building Code
  - Committees represented by experts in Commercial and Residential buildings
  - Public, Open process for national and international consensus
Energy Codes Background

• **Arkansas Energy Code**
  – Latest update was adopted in 2014
  – Based on the 2009 IECC and 2007 ASHRAE 90.1
  – Arkansas Field Study and Survey to show compliance

• **2012 Arkansas Fire Prevention Code**
  – International Building Code: 2012 IECC Commercial
  – 6-year renewal (2018 IBC and 2018 IRC coming soon)

• **2010 Arkansas Mechanical Code**
  – 2018 Arkansas Mechanical Code coming soon
Building Types

• RESIDENTIAL
  – Single Family House, Duplex, Townhome, Apartment, Bed-and-Breakfast
  – 3 stories maximum

• COMMERCIAL
  – Office, Hotel, Apartment, Hospital, Industrial Facility, Restaurant, Church, School, Penitentiary, Retail Store, etc.
Climate Zones

- CZ4: Baxter, Benton, Carroll, Fulton, Izard, Madison, Marion, Newton, Searcy, Stone, and Washington
Compliance Options

• Mandatory Provisions
• Prescriptive
  – U-Factor, C-Factor, F-Factor Alternatives
• Simulated Performance Alternative
  – Energy modeling and reporting
• ASHRAE 90.1 (Commercial)
• Energy Rating Index “ERI” (Residential)
  – Introduced in 2015
Compliance Resources

• REScheck, COMcheck, EnergyPlus, OpenStudio, eQuest, DOE-2, UnmetHours
• TRACE 700, TRACE 3D, Carrier HAP, IES VE, DesignBuilder, TRNSYS, Wrightsoft
• And more
Commercial Energy Codes
Commercial IECC Trends

*Trends are based on an average of all prescriptive requirements
Commercial IECC

• Additional Efficiency Package Options (2012)
  – Prescriptive builders choose 1 of 3 above-and-beyond efficiency packages
    1. HVAC
    2. Lighting
    3. Renewable Energy Source
  – Expanded to 6 choices in 2015, 8 choices in 2018

• Detailed commissioning requirements (2018)
Commercial IECC vs. ASHRAE 90.1

- Option to comply with one or the other
- Pacific Northwest National Laboratory compared 24 key differences between the standards
  - Generally IECC and ASHRAE are almost identical
  - Slight differences in specific performance requirements depending on climate zone and building application
## Summary - Commercial IECC

<table>
<thead>
<tr>
<th>Category</th>
<th>2009</th>
<th>2012</th>
<th>2015</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attic Insulation</td>
<td>↑R-38</td>
<td>→ SAME</td>
<td>→ SAME</td>
<td>→ SAME</td>
</tr>
<tr>
<td>Roof Deck Insulation</td>
<td>↑R-20</td>
<td>↑R20-R25</td>
<td>↑R25-R30</td>
<td>→ SAME</td>
</tr>
<tr>
<td>Wood-framed wall insulation</td>
<td>→ R-13</td>
<td>↑R-20</td>
<td>→ SAME</td>
<td>→ SAME</td>
</tr>
<tr>
<td>Solar Heat Gain Coefficient</td>
<td>→0.25-0.4</td>
<td>→ SAME</td>
<td>→ SAME</td>
<td>↑0.25-0.36</td>
</tr>
<tr>
<td>Envelope Air Leakage (cfm/ft²)</td>
<td>No test</td>
<td>↑0.4</td>
<td>→ SAME</td>
<td>→ SAME</td>
</tr>
</tbody>
</table>
Key Residential Changes Affecting Arkansas

- **Envelope and Duct Tightness**
  - Envelope leakage from 7 ACH to 3 ACH & blower door test
  - Additional air sealing building practices
  - Ducts from 12% leakage to 4%
  - Controlled mechanical ventilation

- **Ceiling Insulation**
  - Depending on Climate Zone, increases R-value requirement by 8 or 19

- **Wall Insulation**
  - Increases from R-13 to R-20
  - New building practices: 2X4 cavity insulation may not be adequate. Alternate or additional material needed to reach R-20.
Residential Trends

Wood-Framed Wall R-Value

(Higher numbers use less energy)

= Average new Arkansas home from 2015 SEEA Field Study
Residential Trends

= Average new Arkansas home from 2015 SEEA Field Study

(Higher numbers use less energy)
Residential Trends

IECC Required % of High-Efficacy Lights

*Arkansas remains at 0% requirement

🌐 =Average new Arkansas home from 2015 SEEA Field Study
Residential Trends

Fenestration U-Factor

(Lower numbers use less energy)

🌐 =Average new Arkansas home from 2015 SEEA Field Study
Residential Trends

Windows SHGC

(Lower numbers use less energy)

=Average new Arkansas home from 2015 SEEA Field Study
Residential Trends

Building Envelope Air Leakage

= Average new Arkansas home from 2015 SEEA Field Study
Residential Trends

Duct Leakage Performance

=Average new Arkansas home from 2015 SEEA Field Study
## Residential Trends

<table>
<thead>
<tr>
<th>State</th>
<th>Blower Door ACH50</th>
<th>Duct Leakage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas</td>
<td>5.4</td>
<td>10.6%</td>
</tr>
<tr>
<td>Alabama</td>
<td>5.2</td>
<td>8.1%</td>
</tr>
<tr>
<td>Georgia</td>
<td>4.9</td>
<td>10.9%</td>
</tr>
</tbody>
</table>
• 2006 – 100_{CZ3} / 100_{CZ4}
• 2009 – 78_{CZ3} / 82_{CZ4}
• 2012 – 71_{CZ3} / 76_{CZ4}
• 2015 – 51_{CZ3} / 54_{CZ4}
• 2018 – 57_{CZ3} / 64_{CZ4}
### Summary - Residential IECC

<table>
<thead>
<tr>
<th>Category</th>
<th>2009</th>
<th>2012</th>
<th>2015</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-efficient Lighting</td>
<td>↑50%</td>
<td>↑75%</td>
<td>→ SAME</td>
<td>↑90%</td>
</tr>
<tr>
<td>Envelope Tightness (ACH)</td>
<td>↑7</td>
<td>↑3</td>
<td>→ SAME</td>
<td>SAME</td>
</tr>
<tr>
<td>Windows U-factor</td>
<td>↑0.35-0.5</td>
<td>↑0.35</td>
<td>→ SAME</td>
<td>↑0.32</td>
</tr>
<tr>
<td>Windows SHGC</td>
<td>↑0.3-1.0</td>
<td>↑0.25-0.4</td>
<td>→ SAME</td>
<td>→ SAME</td>
</tr>
<tr>
<td>Ceiling Insulation</td>
<td>→ R30-R38</td>
<td>↑R38-R49</td>
<td>→ SAME</td>
<td>→ SAME</td>
</tr>
<tr>
<td>Wall Insulation</td>
<td>→ R13</td>
<td>↑ R20</td>
<td>→ SAME</td>
<td>→ SAME</td>
</tr>
<tr>
<td>Slab/Basement/Crawlspace</td>
<td>→ R5-R10</td>
<td>→ SAME</td>
<td>→ SAME</td>
<td>→ SAME</td>
</tr>
<tr>
<td>Insulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor Insulation</td>
<td>→ R19</td>
<td>→ SAME</td>
<td>→ SAME</td>
<td>→ SAME</td>
</tr>
<tr>
<td>Climate Zones</td>
<td>→ 3, 4</td>
<td>→ SAME</td>
<td>→ SAME</td>
<td>→ SAME</td>
</tr>
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</table>
Next steps
Please Provide Your Feedback

- Send Comments to energyinfo@adeq.state.ar.us
- Describe how the proposed Energy Code affects your sector in Arkansas
  - Positive or negative impacts
- Specific revisions to 2018 IECC Standard
  - Cite section number and your comment or revision text (e.g. “Revise C503.2.4.1.1 to say…”)
- Additional suggestions or questions for administering code enforcement or training in Arkansas
Hot Topics

1. Wall Insulation
   - Larger cavity framing, alternative materials or addition of continuous insulation

2. Blower Door and Duct Tests
   - Cost and Performance
   - Mechanical ventilation

3. ERI Compliance Options
Other Conversations

4. Above-code programs
5. High-efficacy Lights
6. Slab insulation
7. Windows U-factor, SHGC
8. Ceiling insulation
9. Programmable thermostat
10. HVAC Equipment sizing
11. Commercial energy code
45 minutes for questions and discussion
Additional Resources

- **2014 Arkansas Energy Code:**

- **Free Public ACCESS to International Standards:**
  https://codes.iccsafe.org/category/I-Codes?search=iecc&page=1

- **Free Access to ASHRAE Standards Read-Only:**
  https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards

- **SEEA Arkansas Field Study:**

- **Building Codes Assistance Project:**
  http://bcapcodes.org/

- **Southeast Energy Efficiency Alliance:**
  https://www.seealliance.org/

- **Energy Efficiency Arkansas:**
  http://energyefficiencyarkansas.org/

- **Arkansas Energy Office:**
  https://www.adeq.state.ar.us/energy/
Additional Resources

- **Comparison of IECC Commercial and ASHRAE 90.1:**
  - 2012: [https://iccsafe.org/gr/Documents/IECC-Toolkit/2012IECC_ASHRAE%2090%201-10ComparisonTable.pdf](https://iccsafe.org/gr/Documents/IECC-Toolkit/2012IECC_ASHRAE%2090%201-10ComparisonTable.pdf)

- **Arkansas Economic Impact of 2015 IECC Residential:**
  - [https://www.energycodes.gov/residential-energy-cost-savings-analysis](https://www.energycodes.gov/residential-energy-cost-savings-analysis)

- **Arkansas Commercial Energy and Cost Effectiveness Analysis 2015:**
  - [https://www.energycodes.gov/development/commercial/cost_effectiveness](https://www.energycodes.gov/development/commercial/cost_effectiveness)


- **Key changes in 2015 IECC:** [https://www.iccsafe.org/codes-tech-support/codes/2015-changes/key-changes-iecc/](https://www.iccsafe.org/codes-tech-support/codes/2015-changes/key-changes-iecc/)

- **Key changes in 2018 IECC:**
  - [http://energy.nv.gov/uploadedFiles/energynvgov/content/Programs/TaskForces/2017/2015%20v%202018%20IECC%20Summary%20%20GQE%20Final%20%20Sources.pdf](http://energy.nv.gov/uploadedFiles/energynvgov/content/Programs/TaskForces/2017/2015%20v%202018%20IECC%20Summary%20%20GQE%20Final%20%20Sources.pdf)