

## Notes from 2022 Title 24, Part 6 Code Cycle Utility Sponsored Stakeholder Meeting for Multifamily Restructuring & CASE Topics

Posted March 22, 2019

### Meeting Information

**Meeting Date:** Monday, February 25<sup>th</sup>, 2019  
**Meeting Time:** 8:00 am – 10:00 am PST  
**Meeting Host:** California Statewide Utility Codes and Standards Team

### Meeting Agenda

Time	Topic	Presenter
<b>10 minutes prior to call</b>	Live Attendee Poll	Energy Solutions
<b>8:00 – 8:10</b>	Welcome and Meeting Ground Rules	Energy Solutions
<b>8:10 – 8:20</b>	2022 Process Overview	California Energy Commission and Utility Team
<b>8:20 – 9:05</b>	Multifamily Proposals <ul style="list-style-type: none"> <li>• Overview of proposed changes</li> <li>• Recommendations               <ul style="list-style-type: none"> <li>○ Standalone chapter</li> <li>○ Harmonize low-rise and high-rise requirements</li> <li>○ Accurate modeling and streamlined compliance</li> </ul> </li> <li>• Definition of multifamily</li> <li>• Prototypes/standard design</li> <li>• Discussion</li> </ul>	TRC
<b>9:05 – 9:50</b>	Introduction to Proposed CASE Topics <ul style="list-style-type: none"> <li>• High/medium/low priority measures</li> <li>• Discussion</li> </ul>	TRC
<b>9:50 – 10:00</b>	Wrap up	Energy Solutions

## Attendees

First Name	Last Name	Email	Affiliation
<b>Statewide Utility Codes and Standards Team</b>			
<i>Utility Staff</i>			
Jeremy	Reefe	jmreefe@semprautilities.com	San Diego Gas & Electric
Jim	Kemper	James.Kemper@ladwp.com	Los Angeles Department of Water and Power
Kelly	Cunningham	kelly.cunningham@pge.com	Pacific Gas & Electric
<b>Codes and Standards Enhancement (CASE) Team Members</b>			
Alanna	Torres	atorres@energy-solution.com	Energy Solutions
Christopher	Uraine	curaine@energy-solution.com	Energy Solutions
Leslie	Nelson	lnelson@energy-solution.com	Energy Solutions
Nate	Dewart	ndewart@energy-solution.com	Energy Solutions
Rahul	Athalye	rathalye@energy-solution.com	Energy Solutions
Jon	McHugh	jon@mchughenergy.com	McHugh Consulting
Elizabeth	McCollum	emccollum@trcsolutions.com	TRC
Abhijeet	Pande	apande@trcsolutions.com	TRC
Neil	Perry	NDPerry@trcsolutions.com	TRC
<b>California Energy Commission</b>			
Larry	Froess	larry.froess@energy.ca.gov	California Energy Commission
Payam	Bozorgchami	Payam.Bozorgchami@energy.ca.gov	California Energy Commission
Peter	Strait	Peter.Strait@energy.ca.gov	California Energy Commission
<b>Other</b>			
David	Reddy		360 Analytics
Vincent	Martinez		Architecture 2030
Reed	Hitchcock		Asphalt Roofing Manufacturers Association
Nick	Young		Association for Affordable Energy Inc.
Sharon	Block		Bright Green Strategies
Jesse	Petersen		Bright Power
Mah-Mood	Sultan		CA Department of Transportation
John	Martin		CA Energy Alliance
Beth	Maynard		CA Housing Community Development
Emily	Withers		CA Housing Community Development
Roy	Eads		CalCERTs
Adrian	Ownby		California Energy Commission
Armando	Ramirez		California Energy Commission
Chris	Olvera		California Energy Commission
Gabriel	Taylor		California Energy Commission

Jeff	Miller		California Energy Commission
Michael	Shewmaker		California Energy Commission
Scott	McCarthy		California Energy Commission
Thao	Chau		California Energy Commission
Evan	Kass		California Treasurer's Office
Gina	Ferguson		California Treasurer's Office
Sertan	Usanmaz		California Treasurer's Office
Jeanne	Fricot		Center for Sustainable Energy
Paul	Reid		City of Azusa
Mark	Holloway		City of Los Angeles
Henry	Pio		City of Santa Clarita
Cindy	Strecker		CLEAResult
Tania	Moshirian		Community Housing Works
Megan	Cordes		ConSol
Jeffrey	Steuben		Cool Roof Rating Council
Tom	White		Eden Housing
Charles	Eley		Eley
Avery	Colter		Fard Engineers
Luke	Morton		FERGUS GARBER YOUNG
Michael	Schaefer		First Community Housing
CAROL	ROBERTS		g.r.e.g Consulting
Rosemary	Howley		Gabel Energy
Marty	Ward		GAF
Serj	Berelson		Google
Robert	Henderson		Henderson Consulting
Karen	Herter		Herter Energy
Jeff	Mang		Hogan Lovells
John	Rose		Home Ventilating Institute
Jim	Lutz		Hot Water Research
Nick	Grahf		ICAST
Les	Nelson		International Association of Plumbing and Mechanical Officials
Jon	McHugh		John McHugh Energy
David	Stephens		Johnson Controls
David	Ware		Knauf Insulation
Gary	Romes		Knauf Insulation
Gwen	Fuertes		Leddy Maytun Stacy Architects
John	Busch		Leviton
Eric	Reuveni		Los Angeles Commercial Real Estate Group
Kevin	McNamara		MacBuilt Solutions
Lillian	Lew-Hailer		MidPen Housing

Shelley	Brock		MidPen Housing
Bruce	Brackett		MidPen Housing
Bruce	Severance		Mitsubishi HVAC
Alex	Boesenberg		NEMA
Sean	Denniston		New Buildings Institute
Margo	Thompson		Newport Ventures
John	Arent		NORESKO
Rebecca	Rice		NORESKO
Pierre	Delforge		NRDC
Rolf	Bienert		OpenADR Alliance
Sidney	Dinwiddie		PABCO Roofing Products
Mike	Miyagi		Panasonic
Ron	Pasquinelli		Panasonic
Kyle	Brumfitt		Partner Energy
Michael	Hsueh		RDH
Sean	Armstrong		Redwood Energy
Rose	Olson		Related
Dan	O'Donnell		Resideo
Vrushali	Mendon		Resource Refocus
Richard	Cardoza		RJC Group Inc.
Tania	Renteria		RSI Energy
Susan	Veazey		Sacramento Housing and Redevelopment Agency
David	VanDiest		San Bernardino County
Barry	Hooper		San Francisco Government
Bach	Tsan		Southern California Edison
Ron	Kliwer		Southern California Edison
John	Barbour		Sempra
Laura	Verduzco		Sempra
Javier	Hernandez		SER-Jobs for Progress, Inc.
Kim	Hogan		Sheer Energy
Steve	Dubin		Sika
Josh	Rasin		SMUD
Scott	Blunk		SMUD
Nehemiah	Stone		Stone Energy Associates
Eric	DeVito		Stone Mattheis Xenopoulos & Brew PC
Joe	Cain		Solar Energy Industries Association (SEIA)
Adam	Chrisman		SunEarth
Chadwick	Collins		The Kellen Company
Beth	Braddy		Trane
Cheryl	LaCombe		TRC
Lewis	Hampton		USA Properties Fund
Wayne	Alldredge		VCA Green
Javier	Saucedo		Ventura County
Daniel	Valverde		Visionary Home Builders of California

Jennifer	Magud		Visionary Home Builders of California
Oscar	Medrano		Visionary Property Management
Joy	Alafia		Western Propane Gas Association

## Resources

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1. [Presentation Slides](#)
2. [Multifamily Code Reorganization Proposal](#)
3. [Multifamily Scoping Paper](#)
4. [Multifamily Flow Chart](#)
5. [Title24Stakeholders.com](#)
6. [EnergyCodeAce.com](#)
7. [LocalEnergyCodes.com](#)

## Key Takeaways and Action Items

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### 1. Multifamily Proposal

- a. Multifamily buildings are a primary focus of the 2022 code cycle. Assembly Bill 1088 (Eggman 2017) prescribed a streamlined compliance and performance-based pathway for multifamily buildings.
- b. The multifamily proposal has four main objectives:
  - i. Reorganize multifamily requirements into a standalone section(s)
  - ii. Increase uniformity across low-rise and high-rise requirements
  - iii. Improve modeling accuracy
  - iv. Streamline compliance
- c. Proposed prototypes/standard design revisions:
  - i. Keep but revise the *Garden Low-Rise* building type prototype
  - ii. Include two new prototypes – *Loaded Corridor* and *Mid-Rise Mixed-Use*
  - iii. Revise *High-Rise Mixed-Use* building type prototype

### 2. Multifamily CASE Topics

- a. The Statewide CASE Team is working to finalize 12 high-priority multifamily CASE measures. Measure-specific stakeholder meetings will occur in Fall 2019.

## Meeting Notes

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### Welcome and Meeting Ground Rules

- Alanna Torres (Statewide CASE Team) presented.

### 2022 Process Overview

- Payam Bozorgchami (California Energy Commission) presented.
- Kelly Cunningham (PG&E, Statewide Utility Codes & Standards Team) presented.

## Multifamily Topics

- Elizabeth McCollum (TRC, Statewide CASE Team) presented.
- Presentation available [here](#).

## Comments and Feedback

### 1. Multifamily Code Reorganization

- Poll: From which of the following would you, your business, or clients benefit? See **Figure 1** and **Figure 2** at the end of this document for a summary of results.*
- Kim Hogan (Sheer Energy): Will the multifamily standards be applicable to the growing assisted living facility market?
  - Elizabeth McCollum (TRC, Statewide CASE Team): This has not been determined, we will need to look into this.
- Ron Pasquinelli (Panasonic): Will the multifamily code apply also to modular units and stackable buildings, built in a warehouse?
  - Elizabeth McCollum (TRC, Statewide CASE Team): Yes, if it is a multifamily building it would comply with multifamily code.
- Kim Hogan (Sheer Energy): Is this also an opportunity to revise tools related to MF projects - such as the California Utility Allowance Calculator (CUAC)?
  - Adrian Ownby (Energy Commission): The CUAC is maintained by the Energy Commission but separate from the Standards.
- Joe Cain (Solar Energy Industries Association): My first impression is the current demarcation cutoff of three versus four stories makes a lot of sense. A two-story triplex or four-plex behaves a lot like townhomes, but four stories residential buildings have less "skin" and behave differently and have different energy drivers.
- Sean Armstrong (Redwood Energy): Want to share analysis from apartment complexes: Three story buildings have one HVAC load and the four-story building has a different HVAC load. It's almost all air conditioning (for four-stories) and it changes our design. Usually we favor heat pumps, but a four-story building without a heating load could have an air conditioner and electric resistance versus a low-rise building would never pass code with that mechanical design. Huge inconsistency triggers a lot of problems. Three and four story might make sense for fire code. All the other language for making consistencies is important.
- Adam Chrisman (SunEarth): Is the solar hot water calculator program within the scope to improve?
  - Elizabeth McCollum (TRC, Statewide CASE Team): This is to be determined and dependent on the CASE topics.
- Bruce Severance (Mitsubishi HVAC): Is the primary difference in modeling between low-rise and high-rise the variable of wall assembly differences?

- i. Elizabeth McCollum (TRC, Statewide CASE Team): There is a difference in the way the software calculates the U-factor, but the requirements also vary.

2. Definition of Multifamily

a. *Poll: How would you define a multifamily building in Title 24, Part 6?*

- i. Sean Armstrong (Redwood Energy): A building with three units or more. Any height or length, the number of units would be the defining factor. HVAC properties change as well as domestic hot water, that is a trigger in how residences change. You can build duplexes that share a water heater for instance. Up to four units can share a water heater. Perhaps four units or more, this matches real estate laws how loans are given.
  1. John Barbour (Sempra): Would that be five units or more, or four units or more?
  2. Sean Armstrong (Redwood Energy): Five units or more. Trying to make it simple for residential folks to not get stuck in doing it in an apartment complex if they didn't want to.
- ii. John Arent (NORESO): High-rise residential building definition should contain a minimum number of units or minimum floorspace.
- iii. Jim Lutz (Hot Water Research): Why are hotel/motel occupancies excluded?
  1. Elizabeth McCollum (TRC, Statewide CASE Team): They have different schedules than your typical multifamily building.
  2. John Arent (NORESO): Hotel/motel occupancies are treated as nonresidential buildings with 24-hour occupancy. Residential requirements apply to dwelling unit spaces.
- iv. Nick Young (Association for Affordable Energy Inc.): I would be curious how other codes in other jurisdictions (NYC, Vancouver) define multifamily.
  1. Elizabeth McCollum (TRC, Statewide CASE Team): Something we will look at.
- v. Kevin McNamara (MacBuilt Solutions): Multi-occupant rental property.
  1. Elizabeth McCollum (TRC, Statewide CASE Team): If it is a condominium where the owner occupies the unit, it would not be multifamily. Anyone want to expand?
  2. Kevin McNamara (MacBuilt Solutions): Key is the "rental" qualified.
- vi. Joe Cain (Solar Energy Industries Association): Develop language that means "not within the scope of California Residential Code". Scope of California Residential Code is one- and two-family dwellings and townhomes.
  1. Sean Armstrong (Redwood Energy): Joe, I think it would be fine to call all the MF code to be R-2 based, or 3+ units.

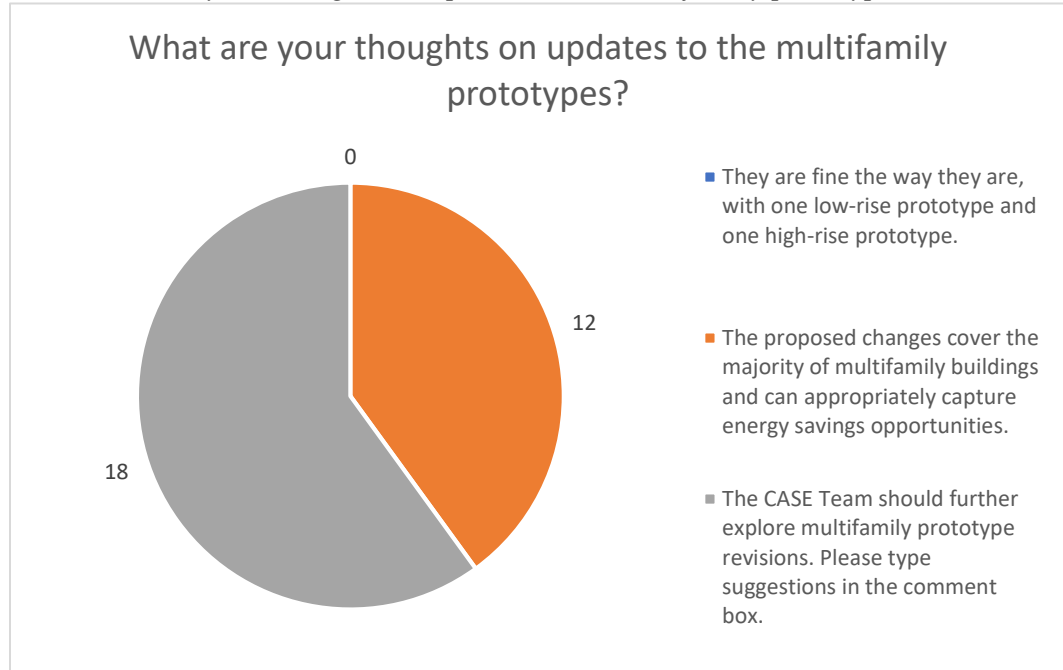
2. Joe Cain (Solar Energy Industries Association): Perhaps multifamily is other than one- and two-family dwellings and townhomes.
  3. Wayne Alldredge (VCA Green): I like the idea of five or more units, however, I would agree with Joe Cain for simplification that "other than one- and two-family dwellings and townhomes" would work.
- vii. Kim Hogan (Sheer Energy): How will assisted living facilities with more than 16 people be viewed? Presently they are modeled as hotel/motel but that doesn't really describe the function of the building.
1. Elizabeth McCollum (TRC): We will include this consideration in our definition of multifamily?
3. Prototypes/Standard Design
- a. Nick Young (Association for Affordable Energy Inc.): TCAC might have data based on some Placed-in-Service documentation submitted for projects.
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): We have identified this source and will investigate.
  - b. Joe Cain (Solar Energy Industries Association): "Tall wood" multistory buildings is an emerging topic with cross-laminated timber.
  - c. Sean Armstrong (Redwood Energy): For developments that committed to 15% above Code, TCAC may have Title 24 documentation. Likely kept by the developers/consultants though, with just a letter sent in to testify to energy goals.
  - d. Charles Eley (Eley): What are your reasons for specifying window area as function of floor area, as opposed to exterior wall area, as is currently the case?
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): We would like to align the metric between low-rise residential and high-rise residential in 2022. Currently, low-rise looks at window-to-floor and high-rise looks at window-to-wall. There are different reasons for this, but we would like consistency.
  - e. Sean Armstrong (Redwood Energy): It would be rare for a single family to occupy three townhomes, right? So, a 3+ unit standard for multifamily automatically captures rentals.
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): To a certain extent. A condo would be a multifamily building with owner occupants. It would capture rentals and something beyond rentals as well.
  - f. Sean Armstrong (Redwood Energy): A number of cities are starting to ban gas in multifamily buildings in the downtown. Looking forward, we should reconsider a gas baseline at all for multifamily and let electric be the baseline. People don't want it much anymore except for domestic hot water.
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): Are they removing gas from existing buildings as a part of that ban?
    - ii. Sean Armstrong (Redwood Energy): Yes. The low-income weatherization program has been removing gas since 2016. It's been a disproportionate



use of public funds. Specifically, it goes after water heaters and is removing them from apartment complexes.

- iii. Elizabeth McCollum (TRC, Statewide CASE Team): We are looking at an all-electric pathway for multifamily. Along with that there would be an all-electric version of all the proposed prototypes.

g. *Poll: What are your thoughts on updates to the multifamily prototypes?*



h. **Figure 3** for results.

- i. Pierre Delforge (NRDC): Why only have a gas baseline in this prototype, when CA policies are pushing the new construction market toward electric HVAC and domestic hot water (DHW)? At a minimum, there should be independent prototypes for gas and electric.
- j. Scott Blunk (SMUD): Is gas really the dominate heating fuel in multifamily?
  - i. Elizabeth McCollum (TRC, Statewide CASE Team): Based on what we’ve seen, yes. Heat pumps are increasing in popularity though. We are still on the cusp of crossing that threshold.
- k. Joe Cain (Solar Energy Industries Association): As PV is prescriptively required for low-rise residential in 2019 Building Energy Efficiency Standards, does this mean that if multifamily is revised to eliminate demarcation by stories that PV is required for all multifamily regardless of number of stories?
  - i. Elizabeth McCollum (TRC, Statewide CASE Team): That is a distinct possibility if we apply the low-rise rule, however it will limit the size of the system required. We are exploring this in the 2022 update.
- l. Sean Armstrong (Redwood Energy): We are succeeding with six story, all-electric ZNE with 20% of the roof left over.

- m. Michael Hsueh (RDH): Variable refrigerant flow (VRF) is becoming popular enough that it can be considered to be more representative in the future compared to four-point fan coil (FPFC).
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): This is good feedback. If you have data sources to share we would appreciate access.
  - n. Avery Colter (Fard Engineers): FPFC suggests chilled water cooling, which in 17 years my Mechanical Electrical Plumbing firm has specified almost never.
  - o. Scott Blunk (SMUD): Heating baseline fuel needs to be electric. New code will hopefully be carbon centric and having a gas baseline give too much leeway. And the standard systems you're compared to are totally different.
  - p. Tom White (Eden Housing): More all electric prototypes.
  - q. Kim Hogan (Sheer Energy): Poll feedback: Considering the very common mini-split heat pumps or VRF as the baseline.
  - r. Bruce Severance (Mitsubishi HVAC): I am concerned about cost-effectiveness of wall assemblies and all cost-effective measures being mandatory instead of trading off with mechanicals. 1" exterior foam is very expensive compared to 2x8 with blown insulation cavity and a thinner 3/8" foam rainscreen.
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): We will look at cost-effectiveness for the code update.
  - s. Sean Armstrong (Redwood Energy): I think PTACs/PTHPs should be the HVAC baseline. That is how we do it, both in CA and NYC for smaller units.
  - t. Scott Blunk (SMUD): I would also like to see MF go in the direction of electric water heating like residential is in 2019 where the electrical capacity is designed for electric water heating even if gas is allowed for the time being.
  - u. Bruce Severance (Mitsubishi HVAC): Are you for sure fixing the inaccuracy of the steel framing assumption in the current hi-rise model, because it severely impacts mechanical system design?
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): We have not proposed changes yet for high-rise. In the mid-rise we are. Let's discuss further.
  - v. Joe Cain (Solar Energy Industries Association): High-density residential has a larger domestic hot water (DHW) demand as percentage of all energy end uses. Solar thermal can make a strong contribution with concentrated DHW demand.
4. Proposed CASE Topics
- a. Sean Armstrong (Redwood Energy): Are we including packaged thermal heat pumps (PTHP)?
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): Possibly. Currently we are looking at mini splits and split systems. Are you proposing we include?
    - ii. Sean Armstrong (Redwood Energy): Yes. And packaged terminal air conditioners (PTACs). As you get taller buildings it's harder to do a refrigerant run and more expensive. There are ducted PTACs. There are fewer refrigerants and a lot of cost-effectiveness with going with a high quality PTAC.

- b. Michael Hsueh (RDH): Regarding infiltration measures, is there opportunity to tie into field verification requirements?
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): Absolutely. We will look into the HERS verification process.
  - c. Bruce Severance (Mitsubishi HVAC): Solar water heating can't be used to pre-heat for heat pump hot water heaters without damaging the equipment! It prevents complete phase change cycle. Please note this.
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): This topic will be vetted thoroughly. There are overlapping measures that touch on this.
  - d. Charles Eley (Eley): Heat pumps will be a challenge for high-rise residential buildings with four-point fan coils.
  - e. Avery Colter (Fard Engineers): AHRI directory does not have a section at all for commercial HPWHs, so no central??
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): We are looking closely into this.
  - f. Nick Young (Association for Affordable Energy Inc.): I hope we base the standards on the most cost-effective system to limit carbon emissions, regardless of aesthetics.
  - g. *Poll: Which of these measures are you likely to support? See Figure 4 for results of the poll.*
  - h. Tom White (Eden Housing): There must be financial incentives for blower door testing of thermal envelope measures.
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): We are looking at cost-effectiveness and will not propose anything that is not cost-effective.
  - i. Anonymous: Why is rigid foam likely not constructible in high-rise?
    - i. Elizabeth McCollum (TRC, Statewide CASE Team): Fire rating is one barrier in multifamily we are aware of.
    - ii. Michael Hsueh (RDH): For fire considerations, can refer to existing National Fire Protection Association (NFPA) 285 rated assemblies to start.
5. Feedback from poll – opportunities for further exploration.

## Poll Results

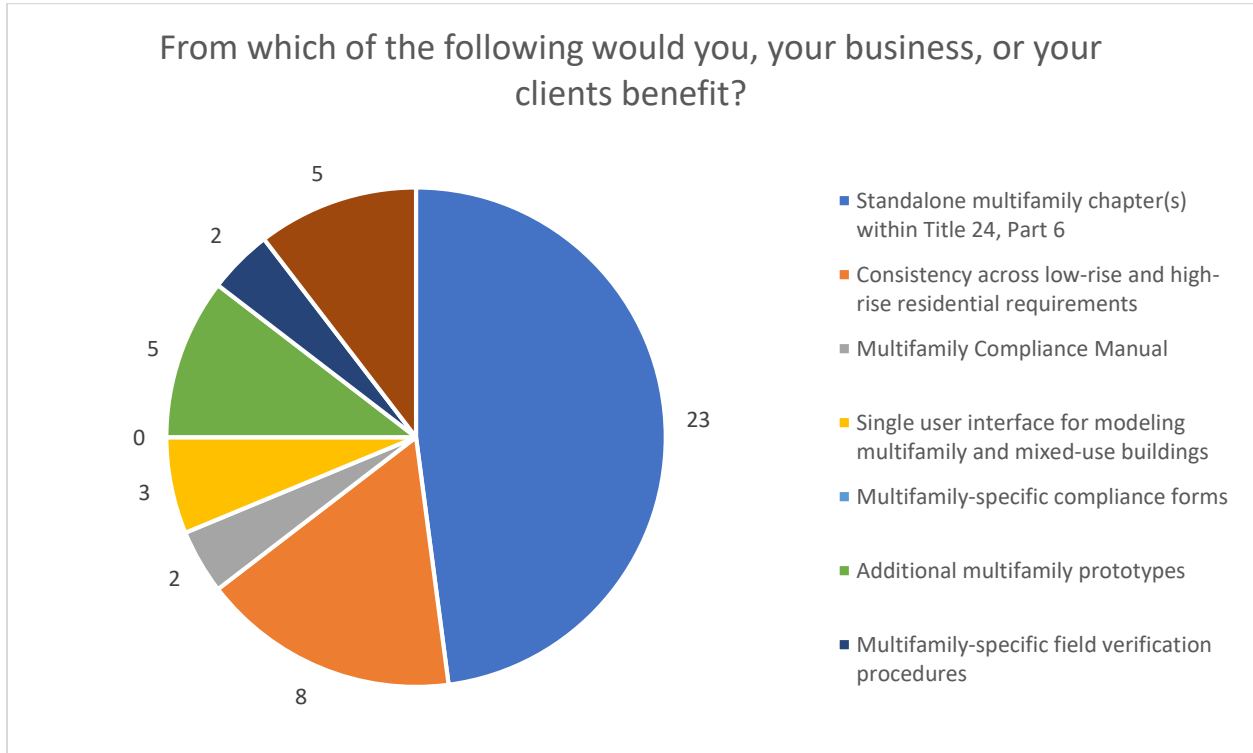


Figure 1: Results of Poll 1, Multiple Choice/Single Answer

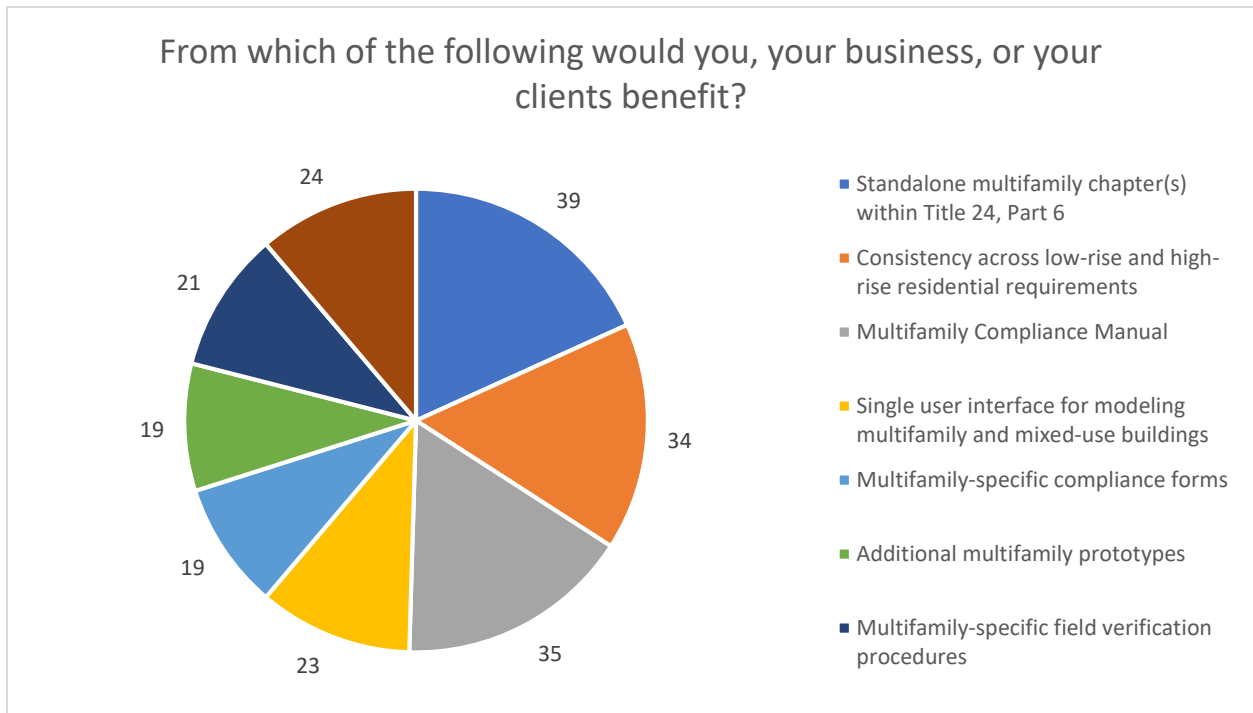
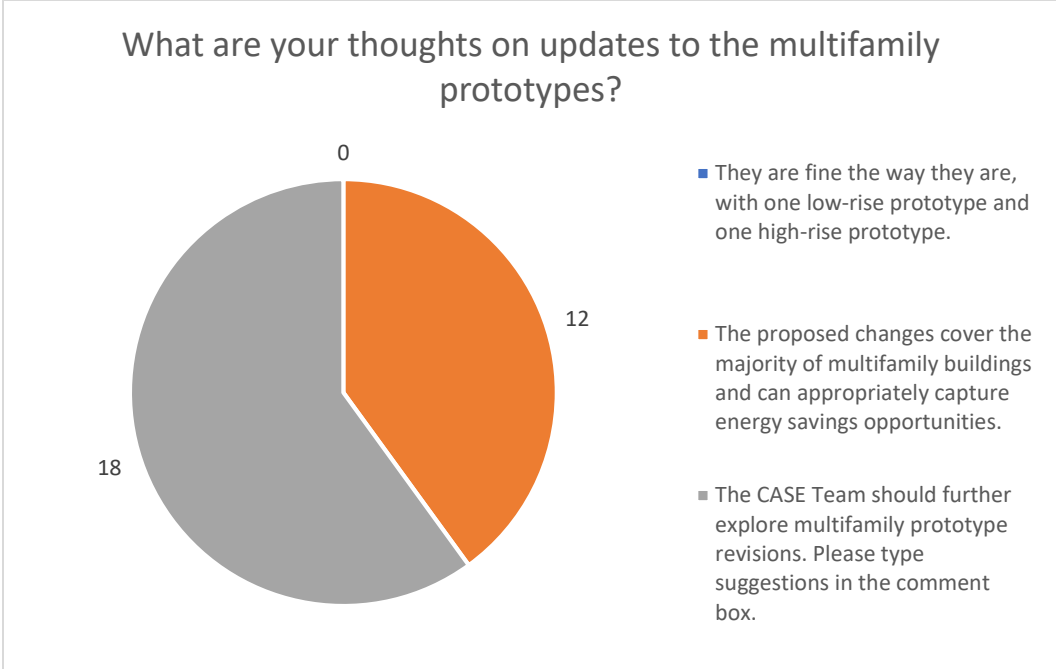


Figure 2: Results of Poll 1, Multi-select/Multiple Answer



*Figure 3: Results of Poll 2, Multiple Choice*

### Which of these measures are you likely to support?

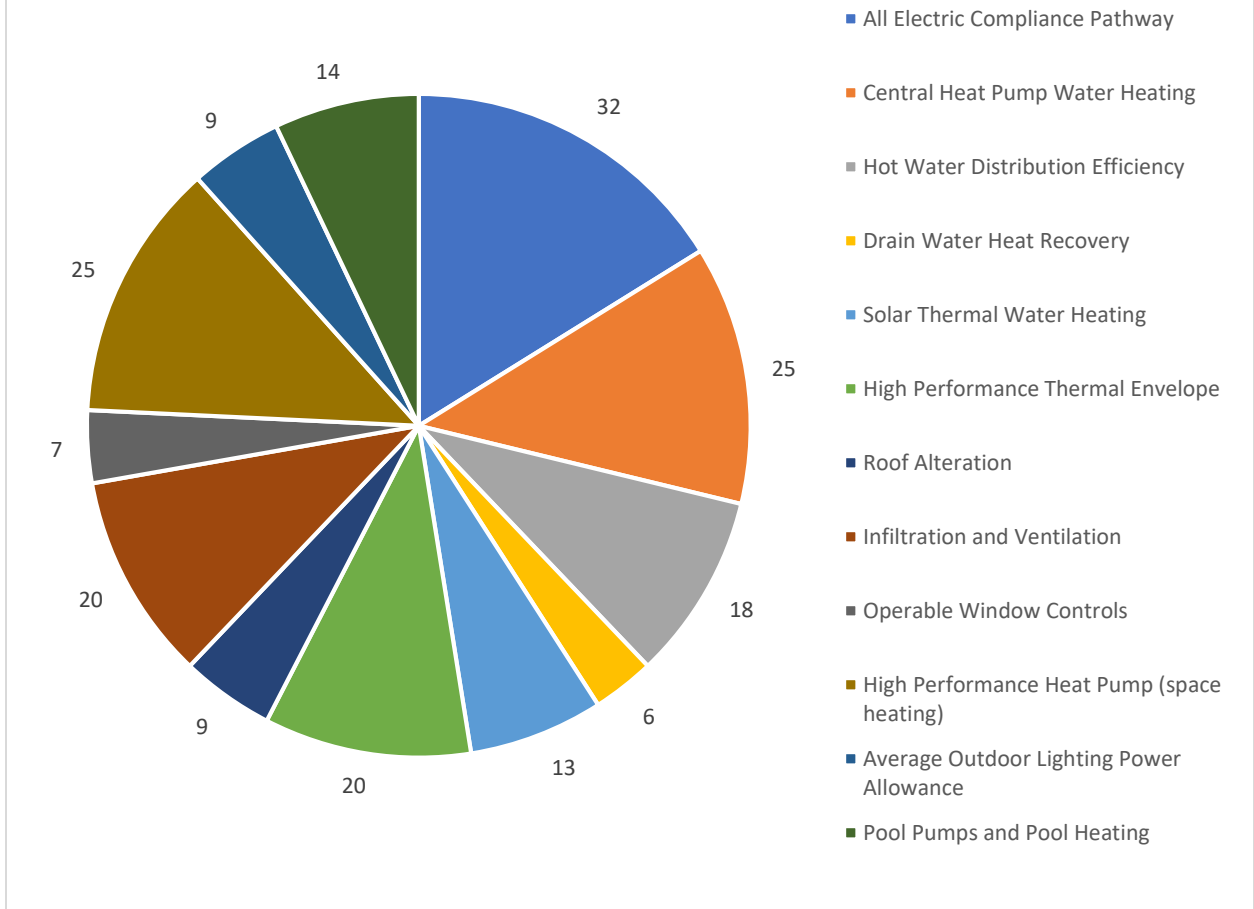


Figure 4: Results of Poll 3, Multi-select