

# May RMC Meeting Energy Code Review

Kurt Stogdill

Manager, Green Building and Sustainability

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# Agenda

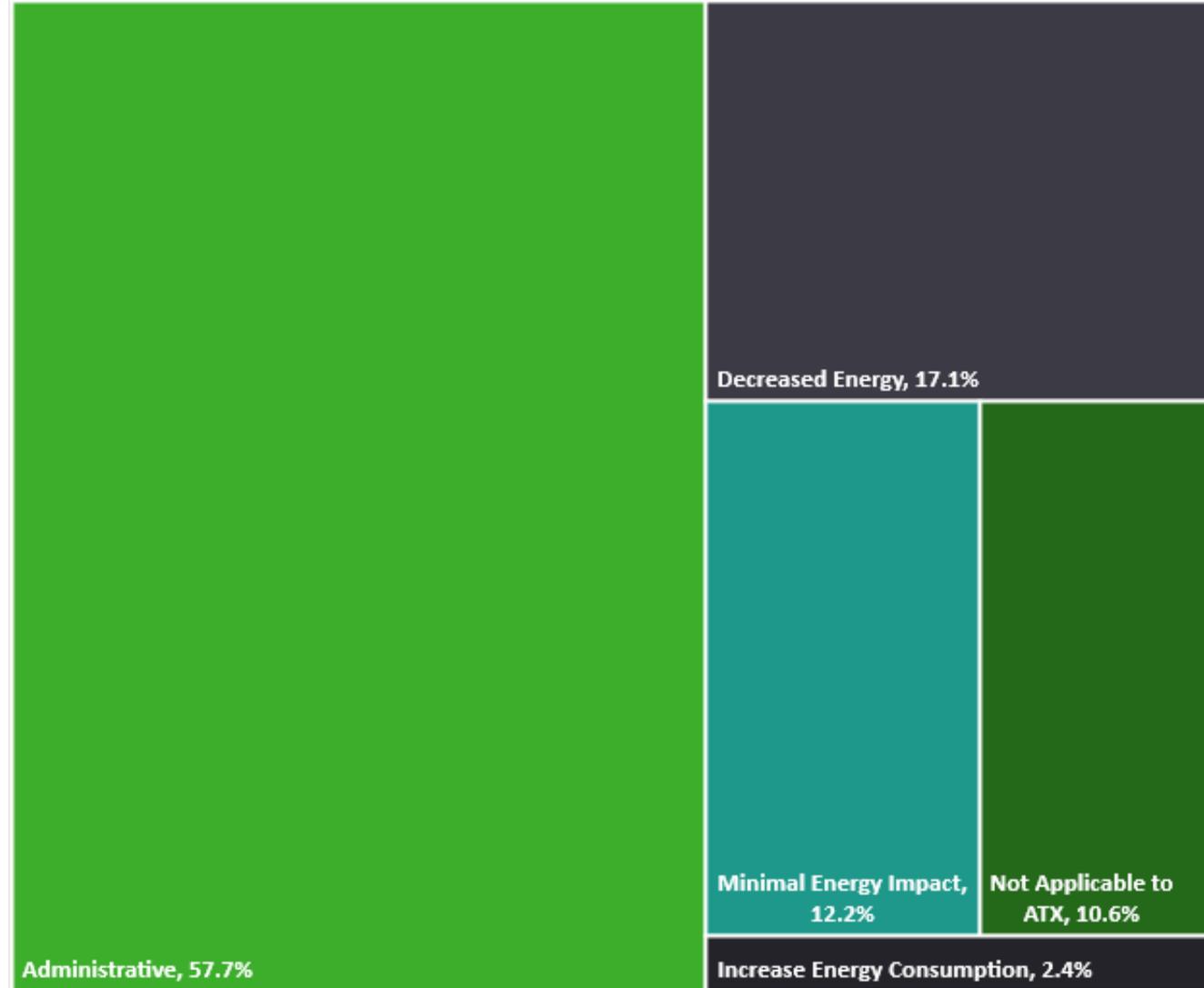
- Significant 2021 IECC Changes
- Stakeholder Input
- Code Impacts
- Affordability
- Next Steps

# Significant 2021 Residential IECC Changes

# 2021 IECC Changes

- **57.7%** Administrative
- **17.1%** Decreased Energy
- **12.2%** Minimal Energy Impact
- **10.6%** Not Applicable to ATX
- **2.4%** Increase Energy Consumption

*Published 2021 IECC can be accessed for free at: [codes.iccsafe.org/content/IECC2021P1/iecc-residential-provisions](https://codes.iccsafe.org/content/IECC2021P1/iecc-residential-provisions)*



# Lighting Changes

- Interior lighting – all permanently installed lighting fixtures to have high efficacy lighting sources
- Exterior lighting for low-rise multifamily to comply with commercial energy code
- Lighting controls to be installed – interior and exterior



# Other Paths of Compliance

## Performance Path

- Updates to baseline
  - Added Dehumidstats
  - Update to water heating
    - Credit for good design
  - Update to mechanical ventilation

## ERI Path

- Updated backstop (limits trade-offs to envelope requirements) to ERI (Energy Rating Index) path
- Renewables – added 5% cap for compliance
- Lowered ERI targets for compliance- lower is “better”
  - ATX to stay at 59

# Additional Efficiency Option Packages

## Prescriptive

### OPTION 1: Enhanced envelope performance option

- 5% better envelope performance

### OPTION 2: Efficient HVAC equipment performance option

- Furnace  $\geq 95$  AFUE and AC  $\geq 16$  SEER
- Air Source Heat Pump  $\geq 10$  HSPF/16 SEER
- Ground Source Heat Pump  $\geq 3.5$  COP

### OPTION 3: Reduced energy use in service water heating option

- Fossil fuel water heater  $\geq 0.82$  EF
- Electric water heater  $\geq 2.0$  EF
- Solar water heater  $\geq 0.4$  Solar Fraction

### OPTION 4: More efficient duct thermal distribution system option

- 100% of ducts and air handler inside building thermal envelope
- 100% of ductless or hydronic system inside building thermal envelope
- 100% of duct thermal distribution system located in conditioned space

### OPTION 5: Improved air sealing and efficient ventilation system option

- Air Leakage  $\leq 3.0$  ACH50
- HRV (75% Sensible Recovery Efficiency) or ERV (50% Latent Recovery/Moisture Transfer)

## Performance

- Pick one option from prescriptive list
- OR achieve 5% better than code

## ERI

- Achieve 5% better on Energy Rating Index

# Local Amendments

- Retained existing amendments where more stringent with published code; deleted amendments where now incorporated in published code
- Deleted requirement for gas water heating with adjacent gas service
- Added new code retaining timer language of
  - Added exception for open-source demand response technology
  - Retained exception for heat pump water heaters

# Significant 2021 Commercial IECC Changes

# Generally

## Thermal envelope certificate required

Posted in mechanical room listing wall insulation levels, window performance, and results of testing

## Additional efficiency requirements section SUBSTANTIALLY revised

Occupancy specific tables, points-based system based on measure pursued and climate zone

## Alternative compliance approved by code official

Specifically allows code official to recognize separate programs as equivalent to energy code compliance

## Home Energy Rating System (HERS) rating allowed, dwelling units in medium to high-density multifamily

# Building Envelope

Air barrier testing for Residential & Institutional occupancy

Interlocks on mechanical systems, openings >40 sq. ft.

Slab edges part of definition “wall above grade”

Envelope table updates, fenestration changes (windows)

# Mechanical

## Fault detection and diagnostics (FDD), >100,000 sq. ft.

*“FDD = A software platform that utilizes building analytic algorithms to convert data provided by sensors and devices to automatically identify faults in building systems and provide a prioritized list of actionable resolutions to those faults based on cost or energy avoidance, comfort, and maintenance impact”*

## Mechanical efficiency tables from ASHRAE 90.1

Variable Refrigerant Flow (VRF), computer rooms, Dedicated Outside Air Systems (DOAS)

## Energy recovery systems (heat recapture for air)

## Guestroom setback (hotel rooms when unoccupied)

# Lighting & Power

Parking garage lighting control, new section

Electrical transformer efficiency

Automatic receptacle control – mandates % of controllable receptacles

Energy monitoring, >25,000 sq. ft.

# Water

Hot water pipe length or volume restriction

# Local Amendments

## Dropped

- Registered design professional (related to commissioning)
- Roofing (now part of published code)
- Interlocks (now part of published code)
- Water heater timers (adding Demand Response alternative)
- Commissioning (now part of published code)

## Recommended to keep

- Encapsulation (to allow insulation to more closely match its labeled value)
- Ventilation filtration, \*MERV 6 (sealing of plenums and filtration)
- Window performance (carve out for Design and Compatibility standards)
- Demand response (to require open-source demand response capability)

# Outreach

# Residential Stakeholder Engagement

## Stakeholder engagement process

- Over 30 external stakeholders representing a variety of interest groups including American Institute of Architects, Home Builder's Association
- Presented to American Institute of Architects
- Over 25 internal stakeholders

## Three notices provided, announcing opportunities to engage with all the residential technical codes

## Public Input: vehicle for further engagement

- Documentation provided: Summary of local amendment changes, proposed ordinance, summary of stakeholder comments and responses
- 211 views to date, 9 non-repetitive suggestions addressing solar ready, EV ready, electric ready, current gas water heating requirements, ERI, air infiltration, attic insulation, and windows
- 61 comments received regarding EV ready and Electric ready
- Stakeholder comments led to a proposed code change for attic insulation at the attic roofline

## Boards and Commissions

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Affordable builders	4.5%
Architects	9.1%
Custom builders - Sustainable	13.6%
Developers - Affordable	4.5%
Energy Code testers/HERS raters	4.5%
Engineering firms	4.5%
Interest groups	36.4%
Manufacturers	4.5%
Mechanical contractors	4.5%
Multifamily builders	4.5%
Production builders	9.1%

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# Commercial Stakeholder Engagement

## Commercial stakeholder engagement process initiated

1/14/2021

- Over 100 external stakeholders, compiled over 15 years representing a broad swath of the community both locally and nationally
- Presented to American Institute of Architects
- Over 50 internal stakeholders, including SPOCs.

## Six notices provided, announcing opportunities to engage with all the technical codes

### PublicInput: vehicle for further engagement:

- Documentation provided: Summary of published code changes, summary of local amendment changes, proposed ordinance
- 183 views, 8 non-repetitive suggestions addressing commissioning, solar/EV ready, support of current activity, consideration of site/source, etc.

## Boards and Commissions

Academia	6	6%
Architect	19	18%
Code Consulting	9	8%
Commissioning	5	5%
Contracting	11	10%
Development	11	10%
Engineering	19	18%
Interest Group	7	7%
Mechanical Engineer	8	7%
Trade Representative	12	11%
	107	

# Projected Code Impacts

# Projected Energy Savings Over 2016 COA Energy Code

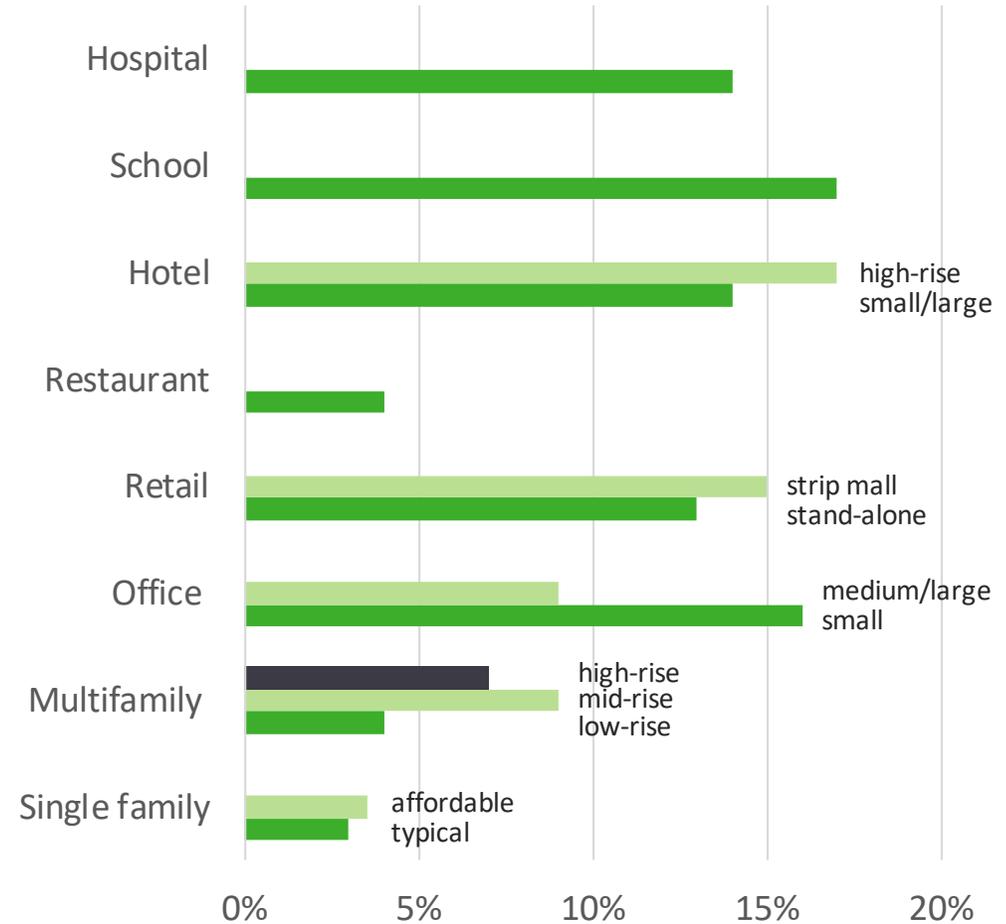
## Projected Savings by Sector

Commercial 31,404 MWh | **10%**

Residential 5,249 MWh | **<4%**

*Based on FY2020 building permits*

## Savings Percentage by Building Type



# Projected Affordability Impacts

# Affordability Impact of Adoption of 2021 IECC

## Insulation- biggest single energy savings measure

- \$430 increase in construction price of home
- Savings of \$27/year
- Peak demand decreased by approx. .5 kW

## With additional energy package (reference slide 9)

- Choose 1 of 5 options or modeling
- Option 3- efficient water heating
  - Approx. \$1,430 increase in construction cost
  - Savings- up to \$102/year
  - 12.8% energy savings over standard approach
  - Peak demand will decrease by 2.2 kW

# Next Steps

# Next Steps

- Recommendation from RMC
  - Need by May 20<sup>th</sup> to meet posting requirements for Council
- Continued work on any outstanding issues
  - Customer Choice
  - Transportation
  - We will report back to RMC in June with proposed path forward and timeline

Thank You  
Questions?

Kurt Stogdill

[Kurt.Stogdill@austinenenergy.com](mailto:Kurt.Stogdill@austinenenergy.com)

512-413-1255



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