Residential Field Study

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

Residential Study
Background

- In 2014 the US Department of Energy funded 3-year **residential energy code studies** in eight states
- Study goals
  - Establish compliance baseline, and **calculate potential savings**
  - Determine if **focused training & support** can improve compliance
- Collected data will be **anonymous**

Residential Study
Data Collection Process

- DOE established a **data collection protocol**
  - Randomized Sampling Plan
  - Key Items Must be Observed
  - 63 Observations of Each Key Item
  - Single Visit to a Given Home
- Collaborative will **provide feedback and guide** the project

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US DOE Key Items

- **Envelope Tightness** (ACH50)
- **Window Solar Heat Gain Coefficient**
- **Window U-factor**
- **Wall Insulation** (R-value and Quality)
- **Ceiling Insulation** (R-value and Quality)

- **Foundation Insulation** (R-value and Quality)
- **High Efficacy Lighting**
- **Duct Leakage** (CFM25)

Residential Survey
Progress To Date

- Recruitment delays due to weather, late project start and construction season timing, building industry irregularities, etc.
- Data collection completed in September 2019
- Anonymized data has been sent to PNNL.
- Results received October 30, 2019.

Residential Study
PNNL Analysis

PNNL conducted these analyses of the collected data:

- ***Compliance Distribution Analysis***
  - Examination of the field data, and data distribution relative to compliance requirements
- ***Measure-Level Savings Analysis***
  - Projection of potential savings associated with improved compliance

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Measure-Level Analysis

- Measure-level analysis includes all key items having **non-compliant observations**
- The savings potential from each non-compliant value is **evaluated in isolation**
- An individual "as-built" model is created for **each non-compliant value**, with all other values remaining at code compliant levels

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Measure-Level Analysis

- An average **energy savings potential** for each key item is then calculated
- State-specific construction volumes and fuel prices are used to calculate the key item **savings potential of full compliance**
- **Share analysis** with stakeholders
- Design and start **support program!**

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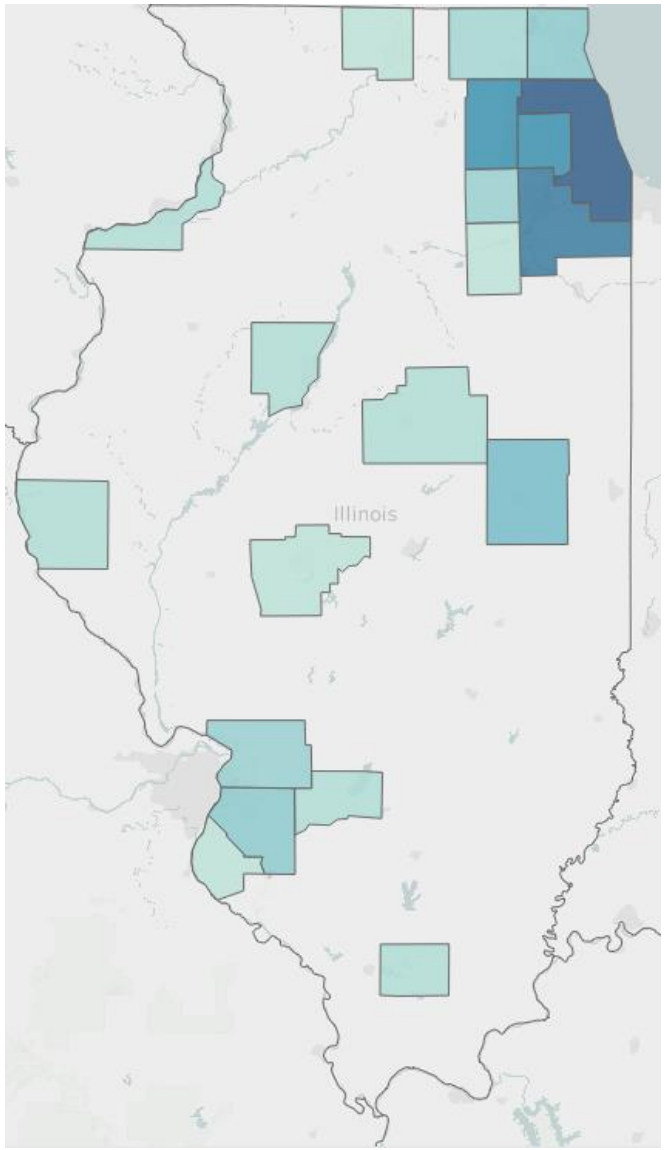
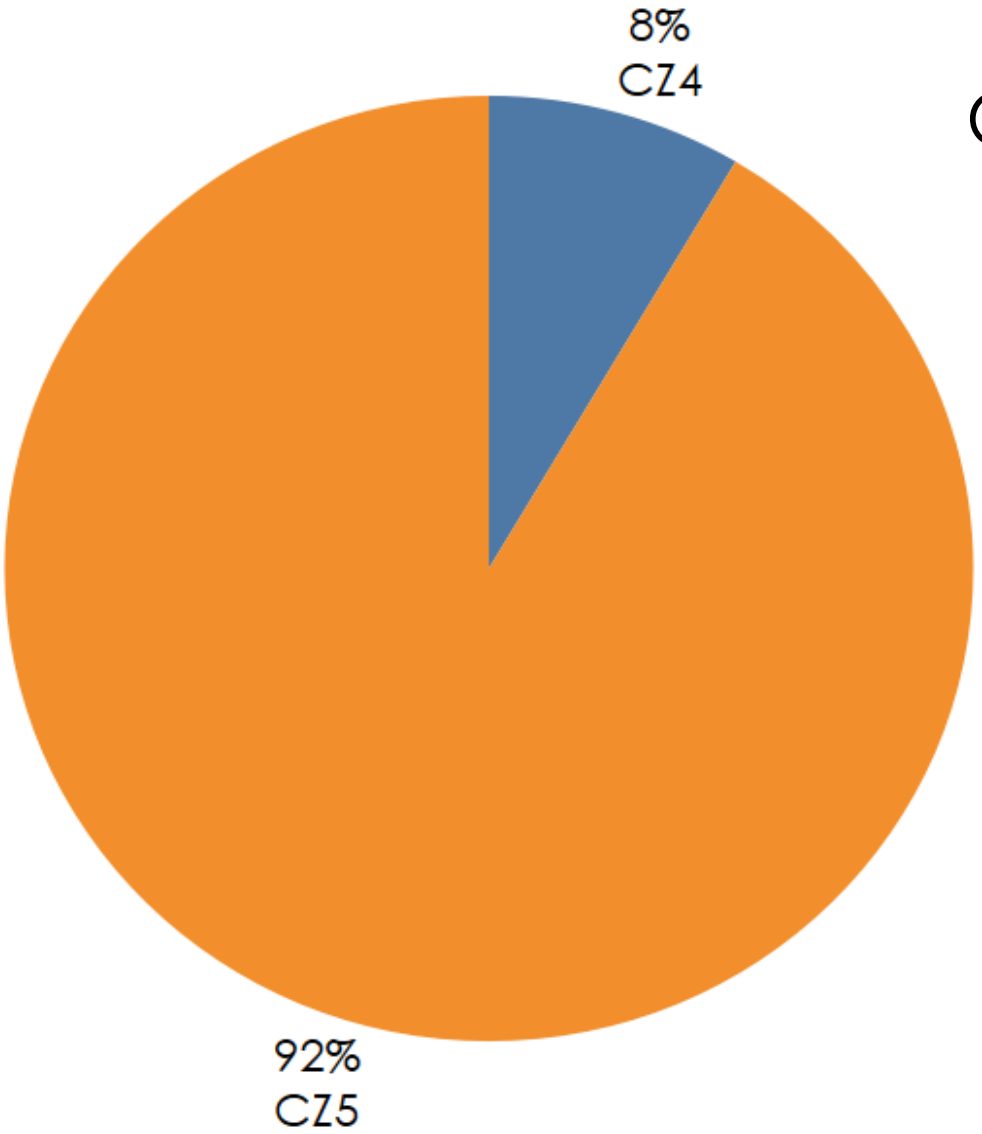
Data collection



Residential Study

Trends based on available data



Climate Zone

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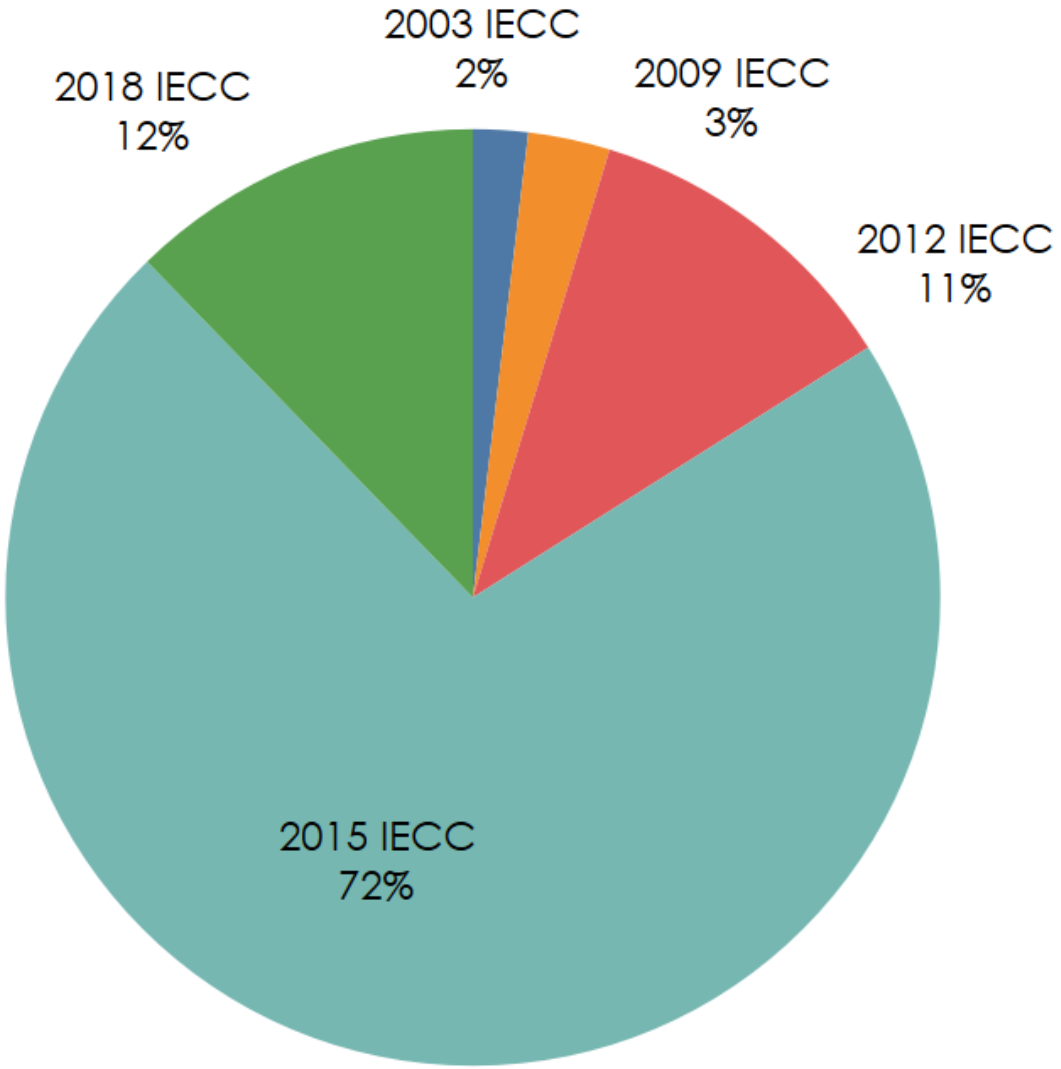
Trends based on available data



Permit Code

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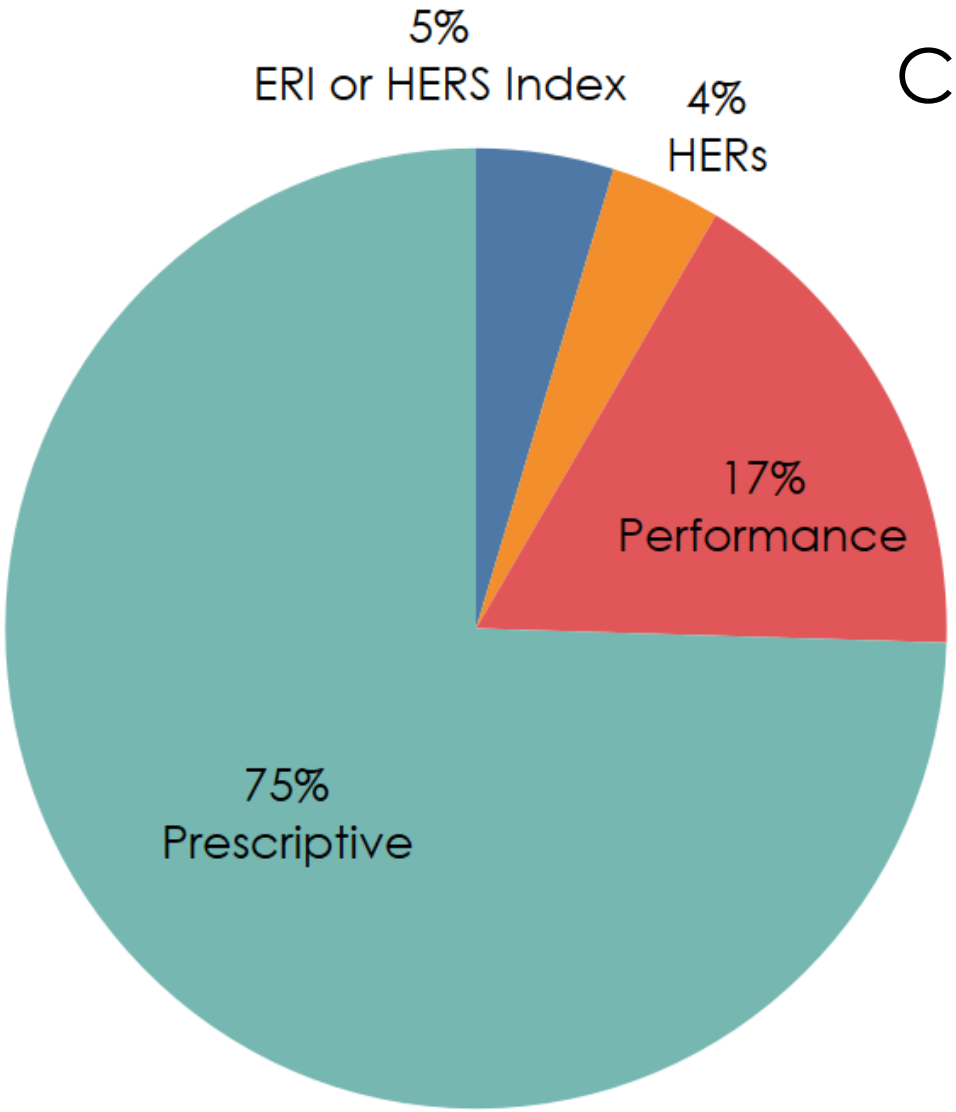
Trends based on available data

Compliance Path



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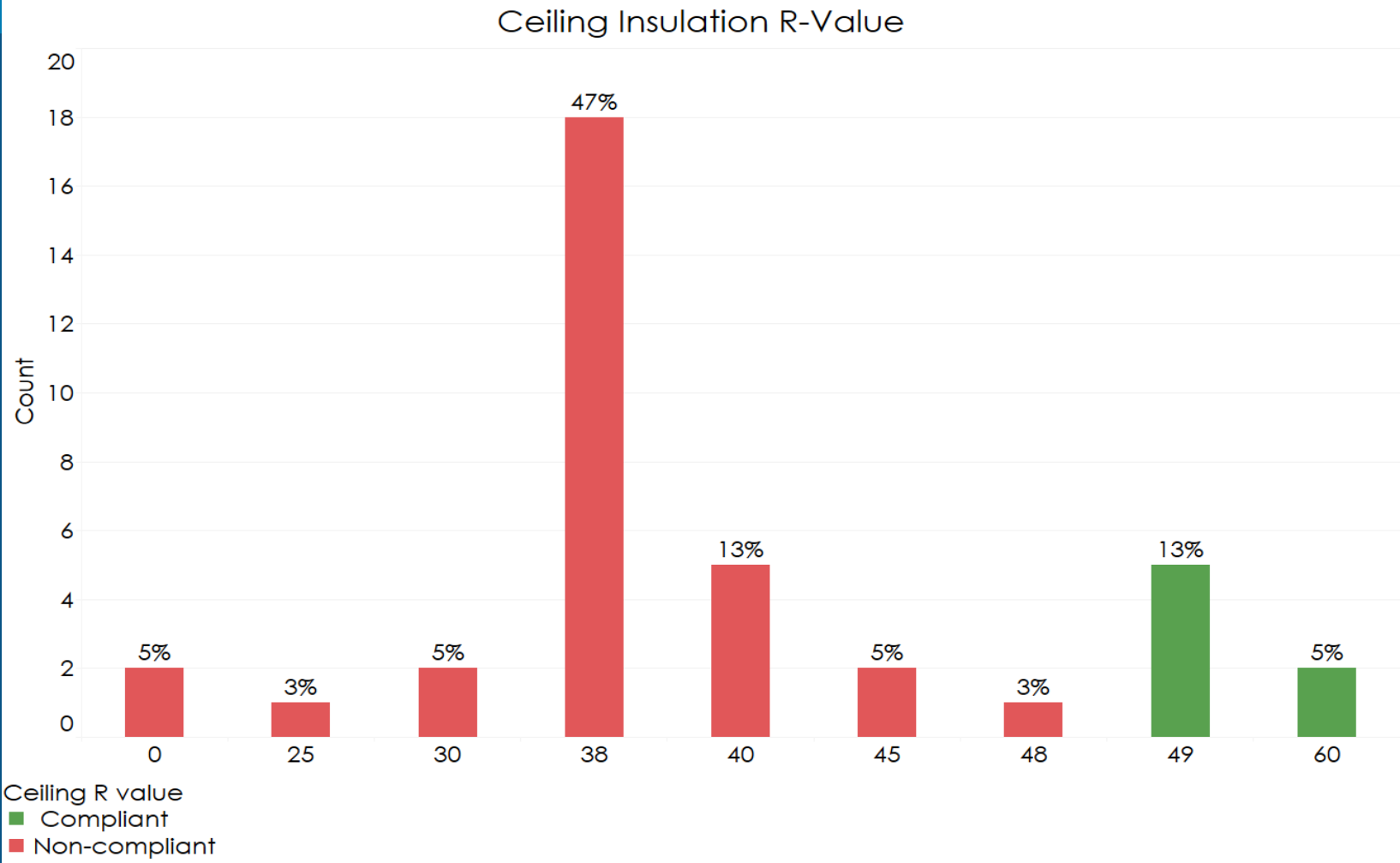

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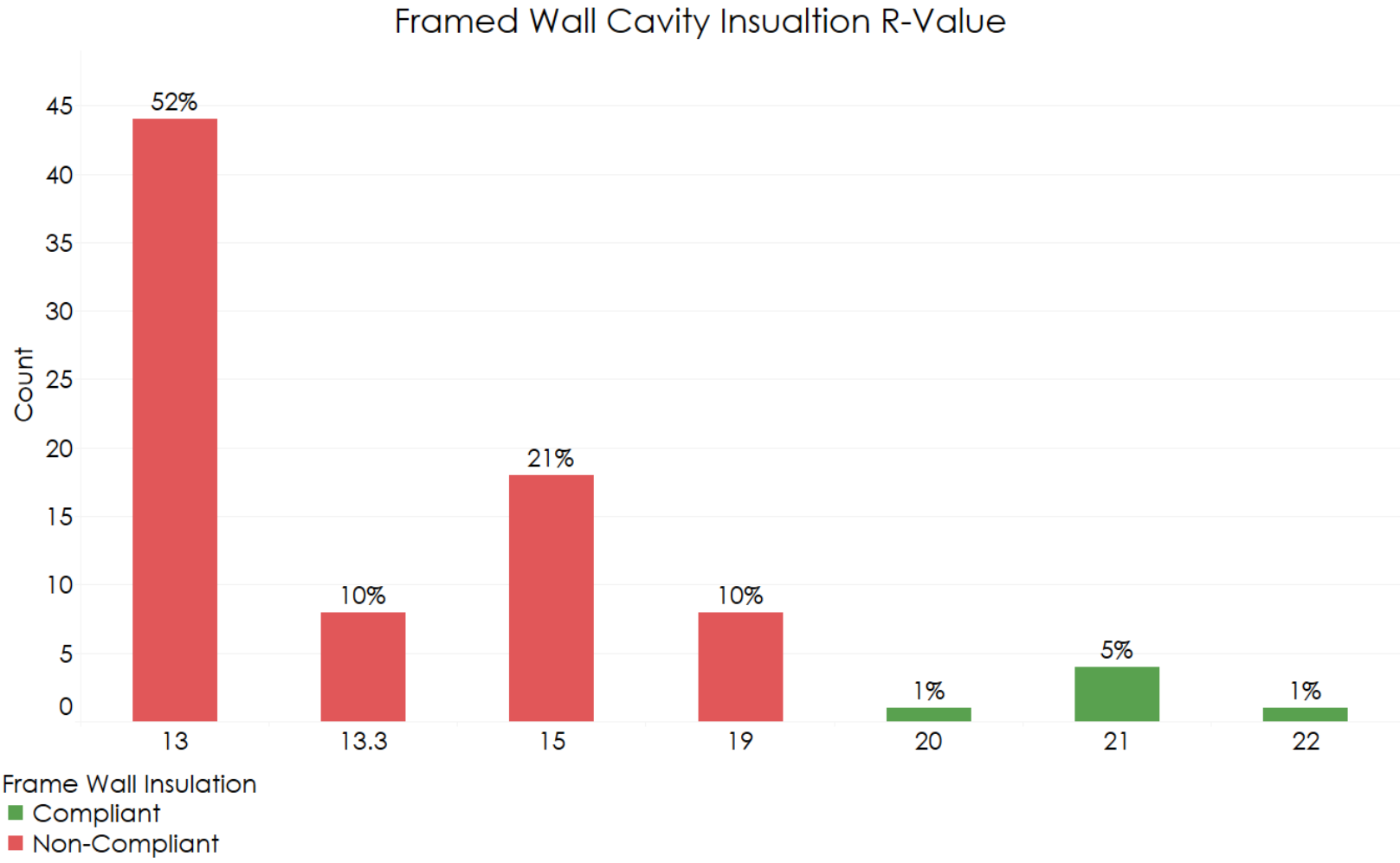

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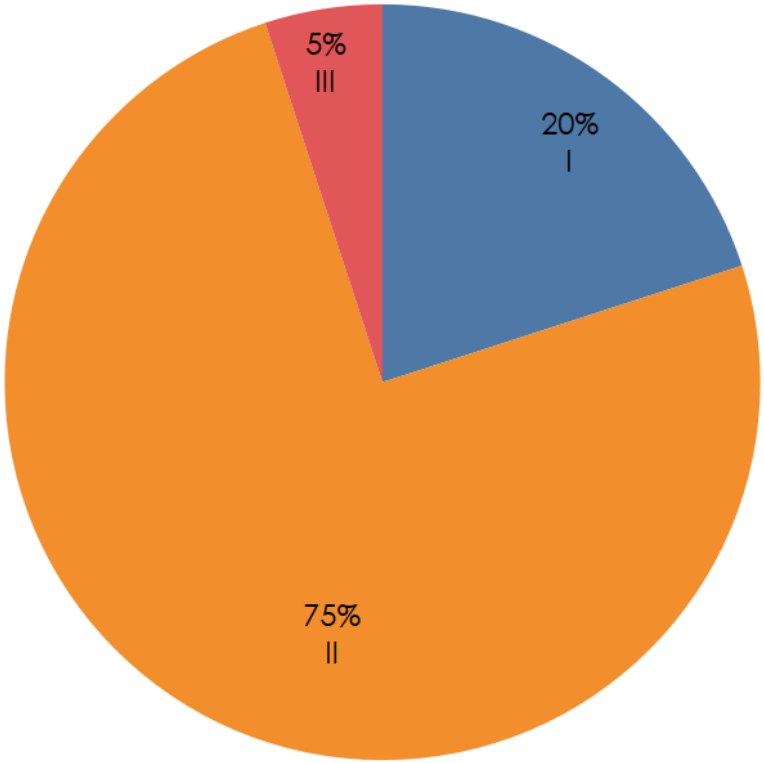
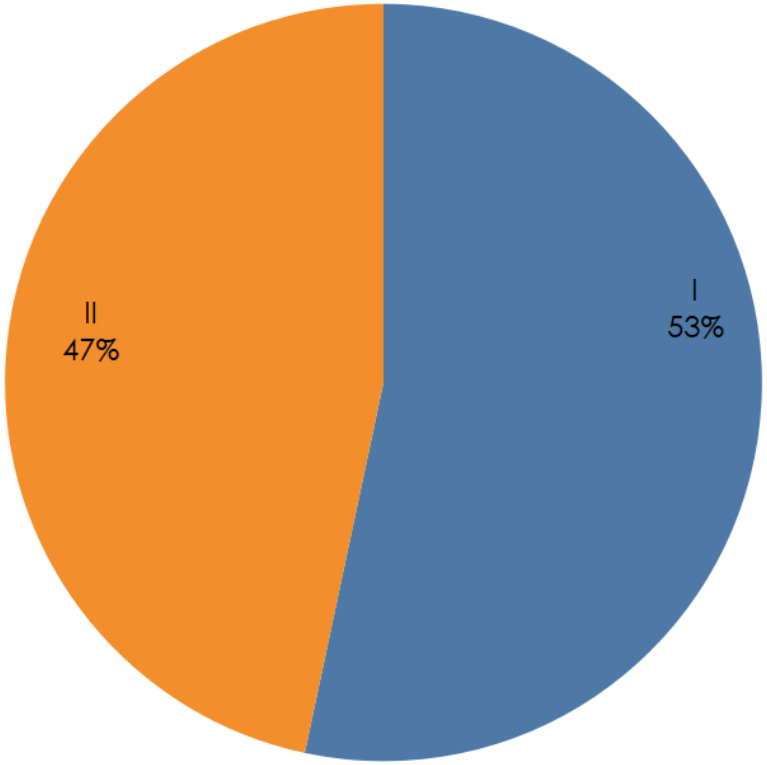
Trends based on available data

Knee Wall Insulation Quality



Basement Wall Insulation Quality



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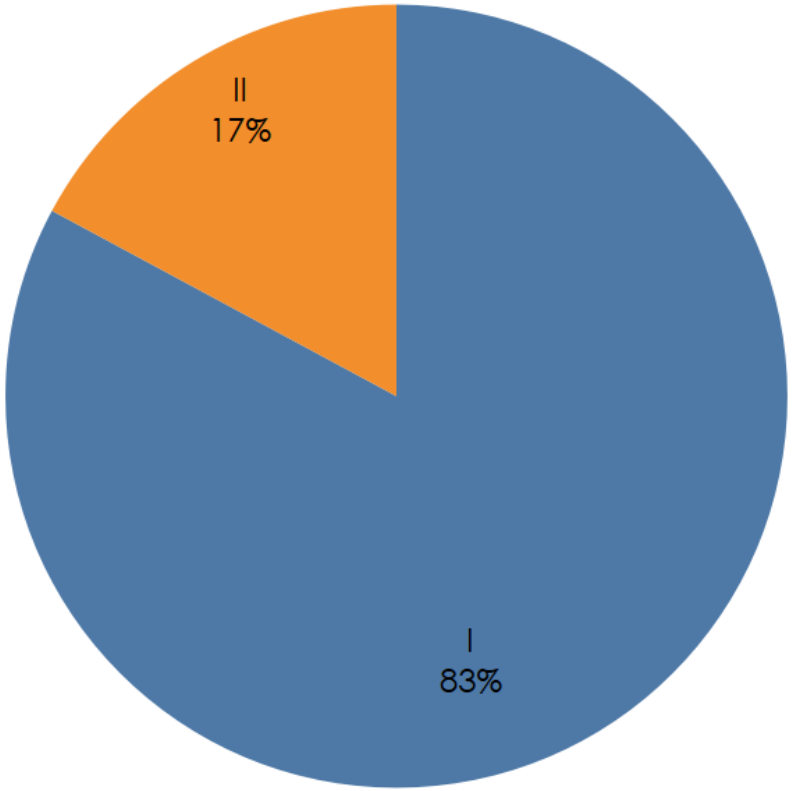
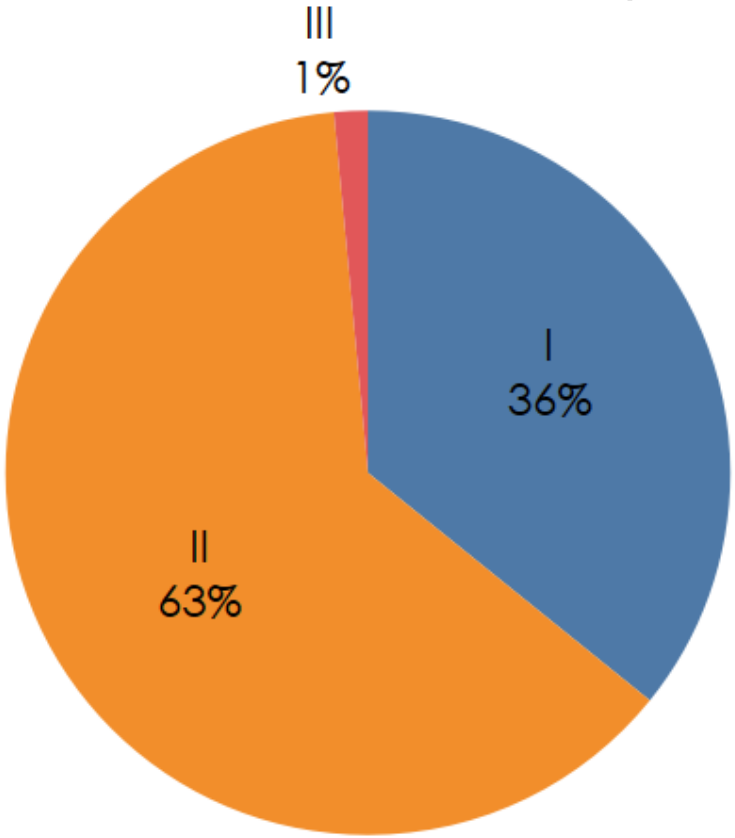
Trends based on available data

Roof Cavity Insulation Quality



Framed Wall Insulation Quality



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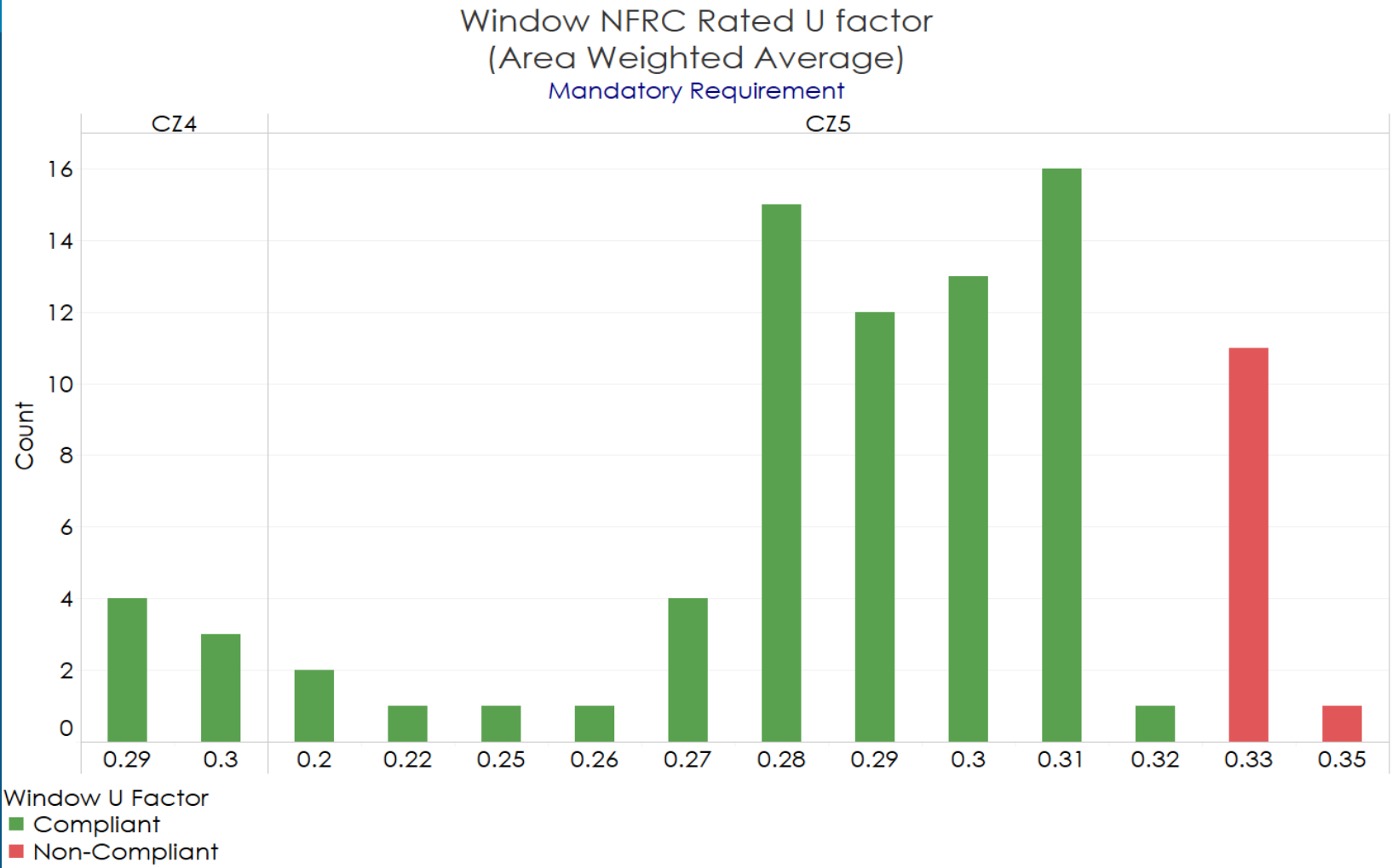

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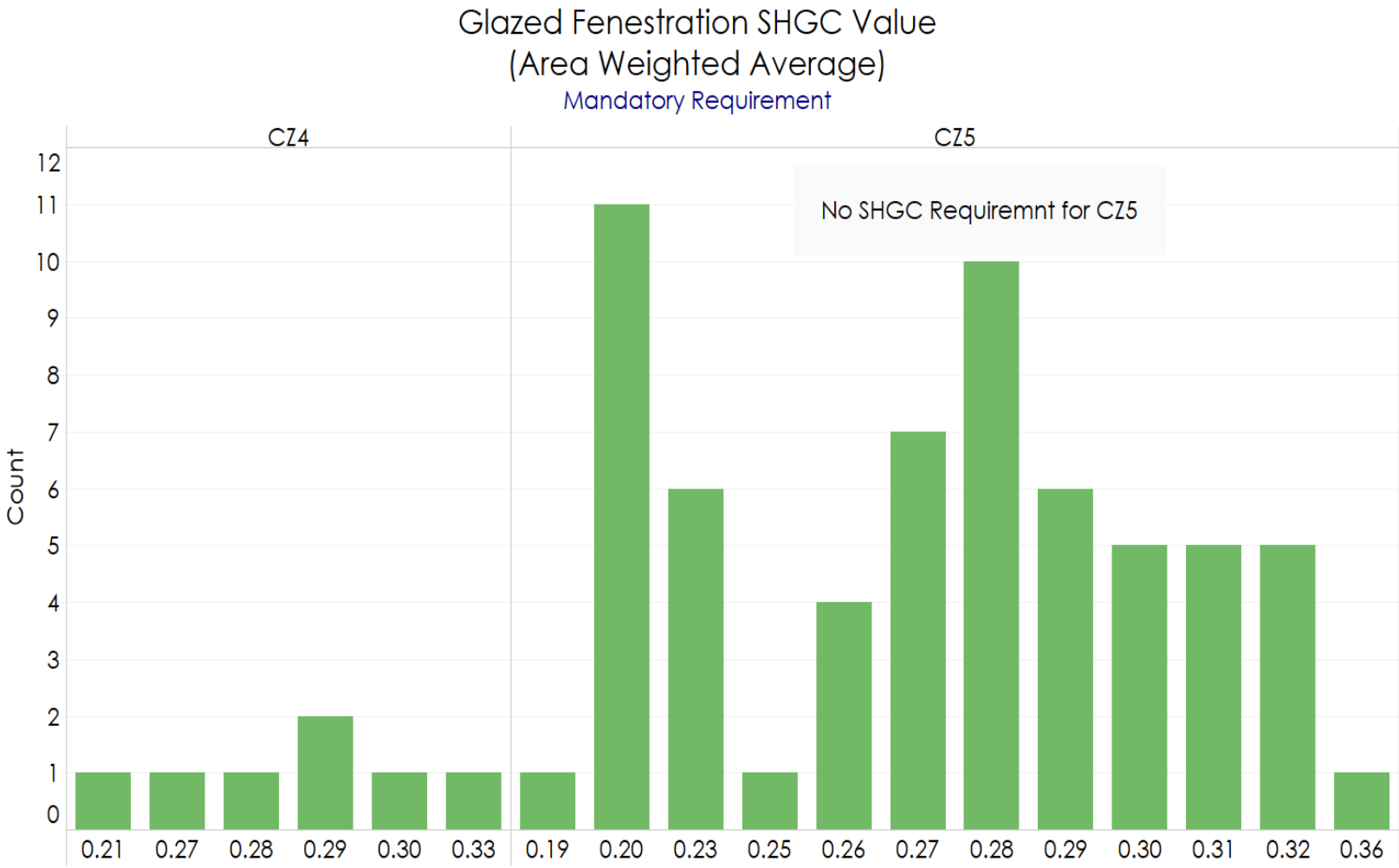

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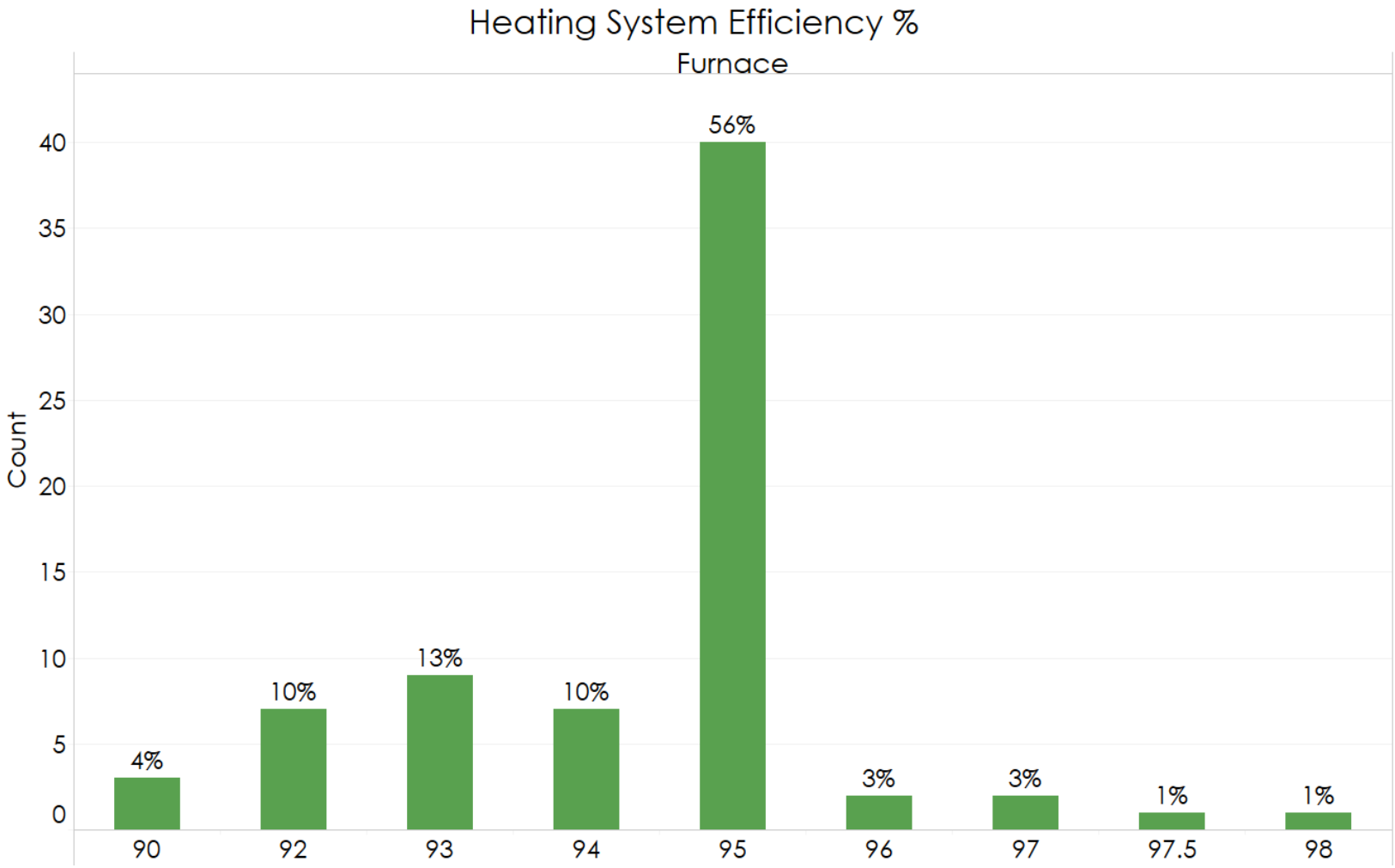

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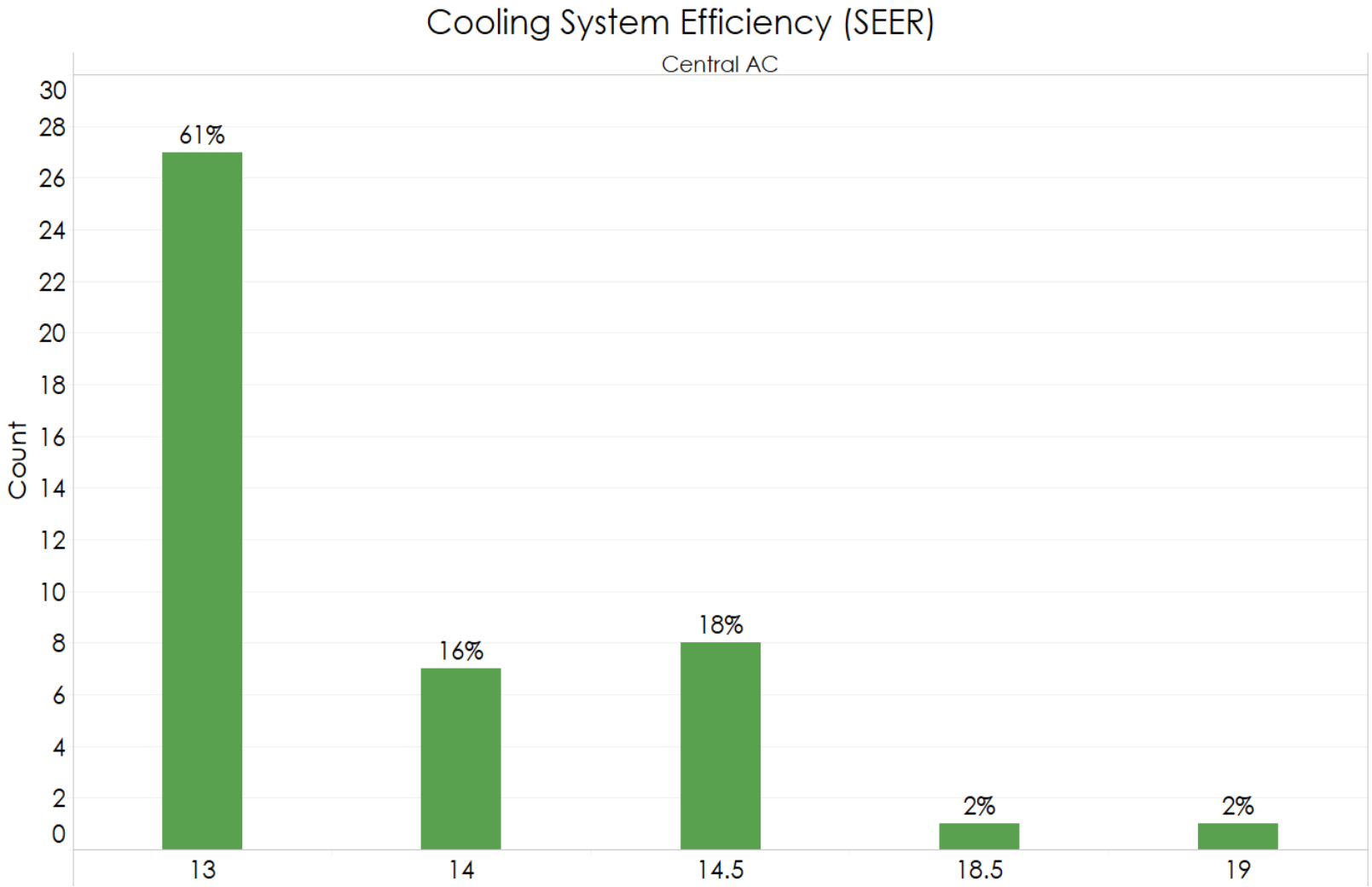

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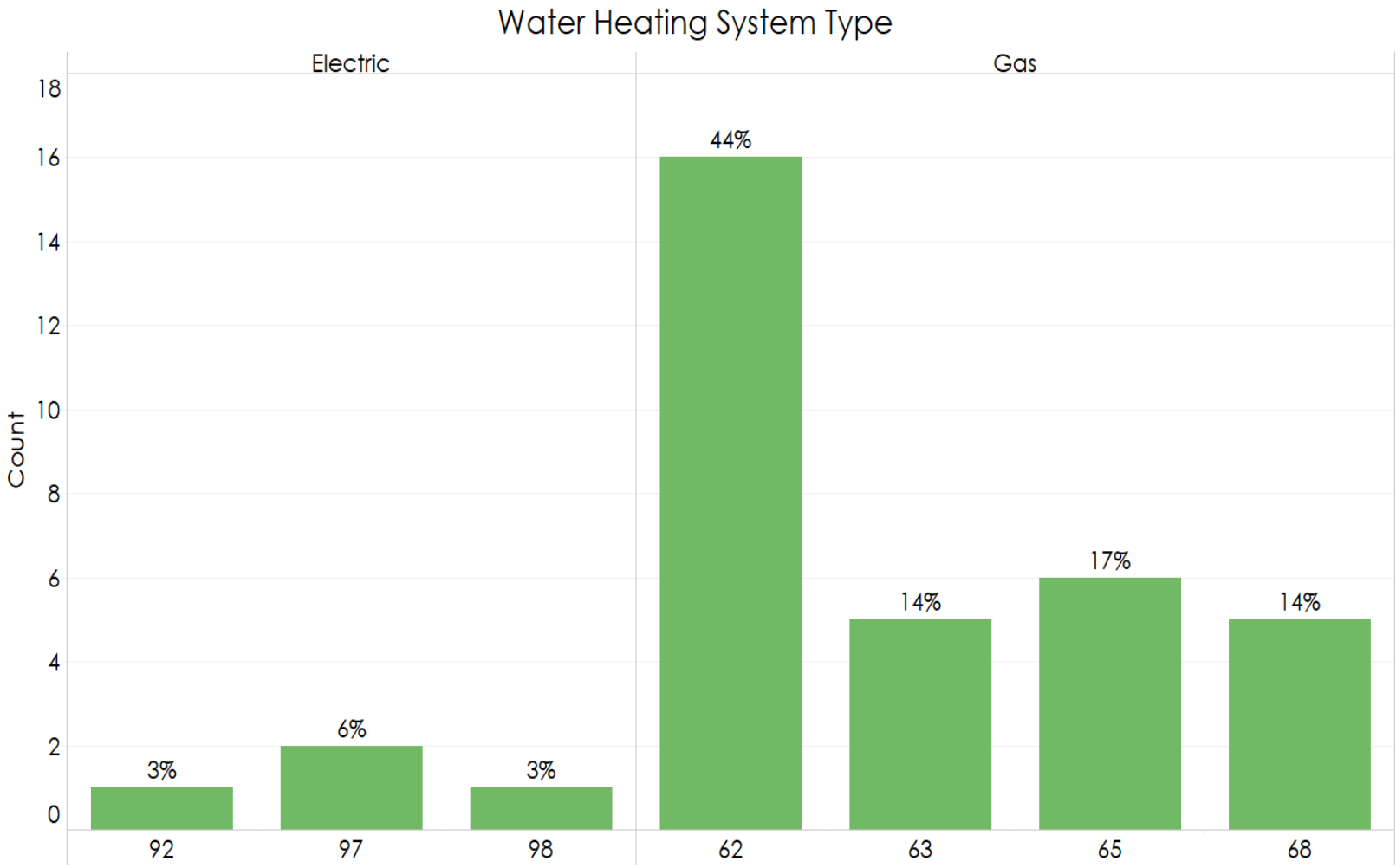

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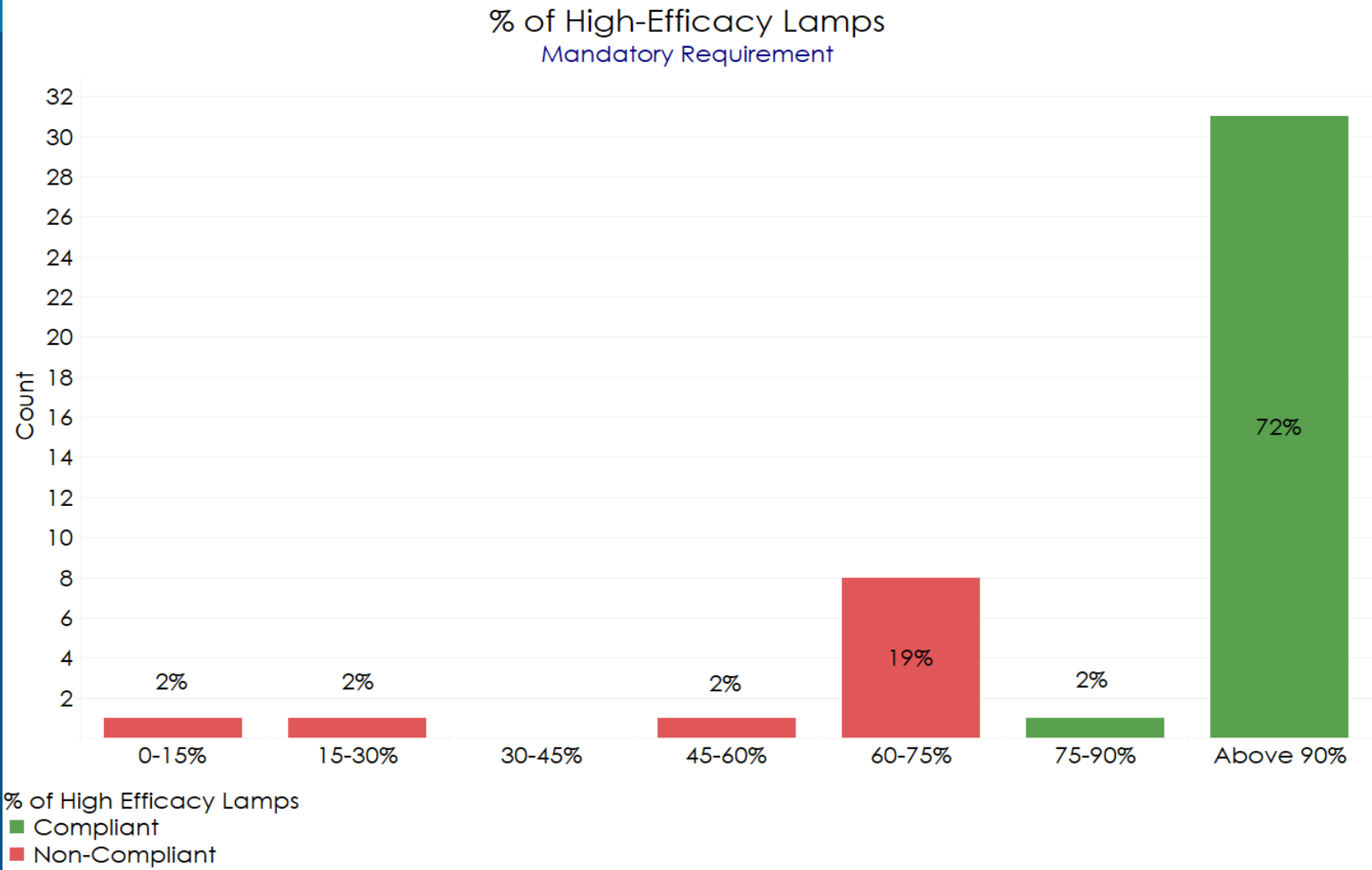

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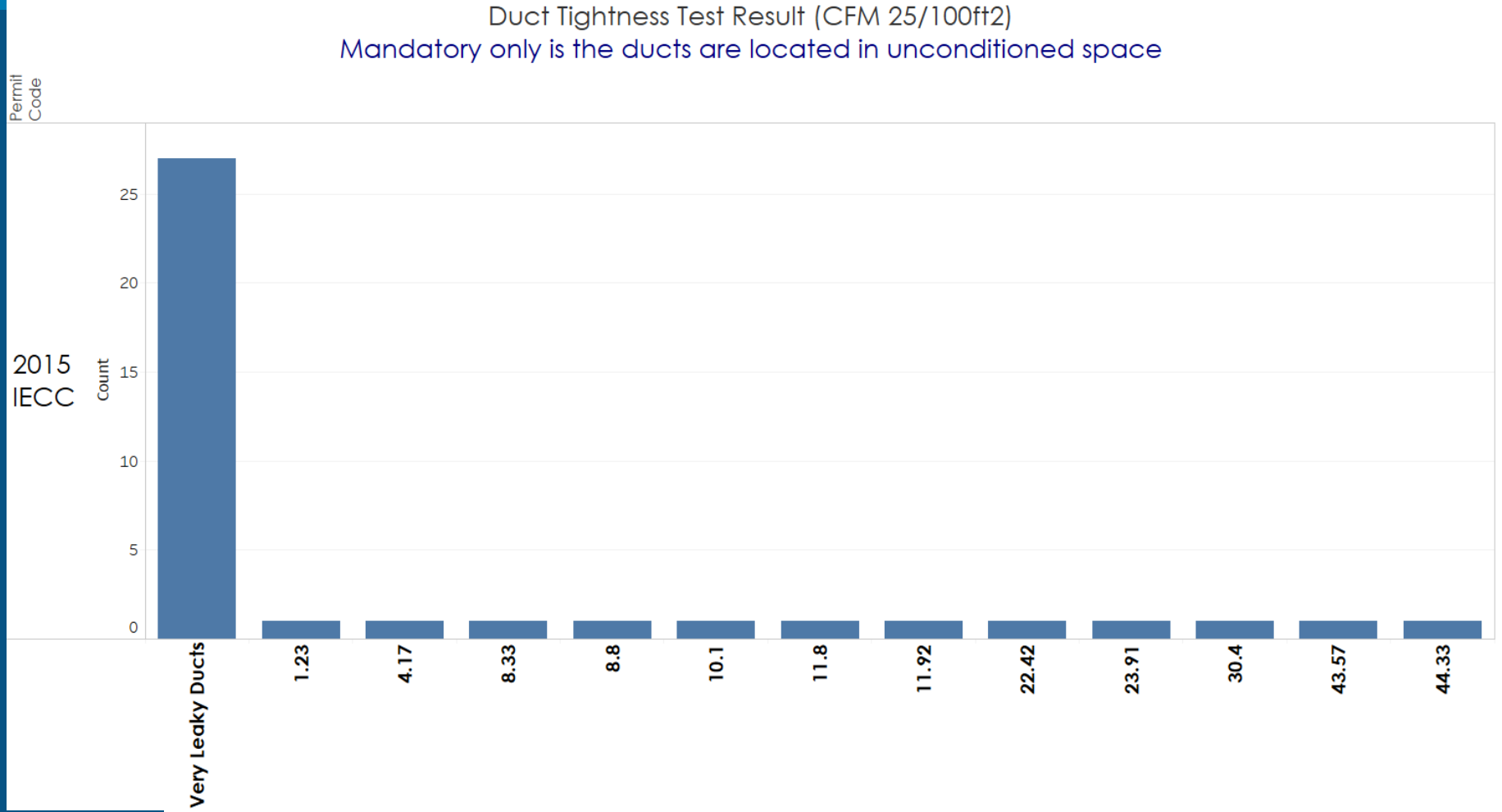

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