



Building Policy in Ohio and the Midwest

Northern AEE Chapter Meeting
Ian Blanding



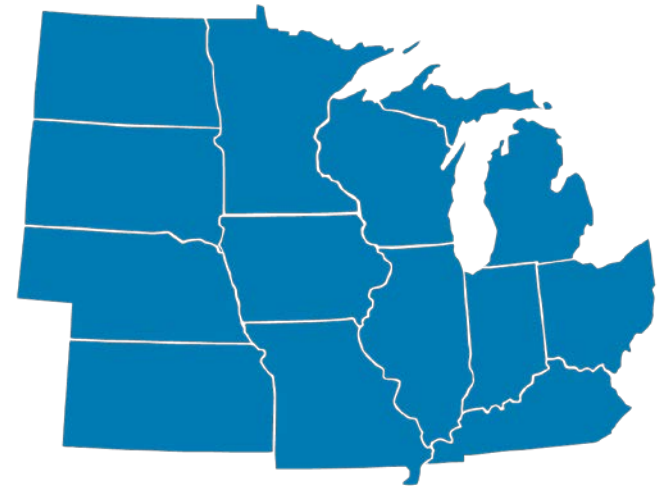
About MEEA

The Trusted Source on Energy Efficiency

We are a nonprofit membership organization with **160+ members**, including:

- Utilities
- Research institutions and advocacy organizations
- State and local governments
- Energy efficiency-related businesses

As the key resource and champion for energy efficiency in the Midwest, MEEA helps a diverse range of stakeholders understand and implement cost-effective energy efficiency strategies that provide economic and environmental benefits.



Agenda

- Intro to Building Energy Codes
- Building Energy Codes in Midwest
 - Ohio Commercial Energy Code
 - Ohio Residential Energy Code Update
- Benchmarking Policies in the Midwest
 - Mandatory vs. Voluntary
 - Example Cities
- Conclusion
- Questions

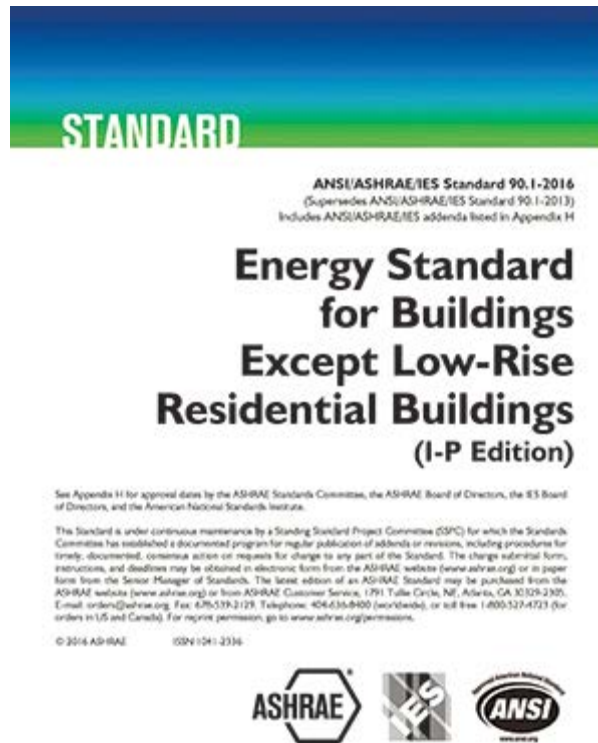
What Is The Energy Code?

- Energy Codes are a set of **consumer protections** that govern the energy use of a building through building practices & components
- Minimum Energy Efficiency Requirements
 - “Worst home that can be built”
 - Levels the playing field for builders
- National Model Codes developed by International Code Council and ASHRAE
 - Updated every 3 years (level of improvement varies)
 - Current edition released in 2015
- States/Municipalities Adopt and Enforce the Code

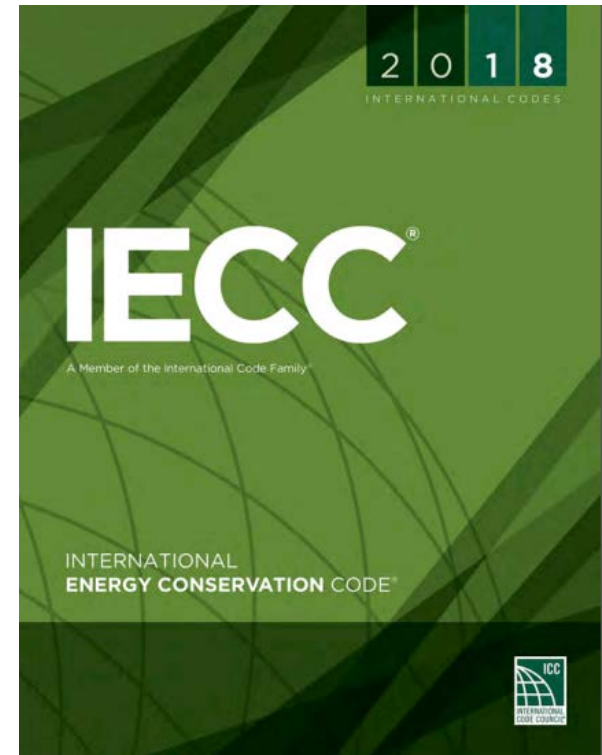
History of Energy Codes

- First codes established in 1975
- Code has gotten more stringent over time, with new codes being more than 50% more efficient than the first codes

Model Building Energy Codes



ASHRAE Standard 90.1

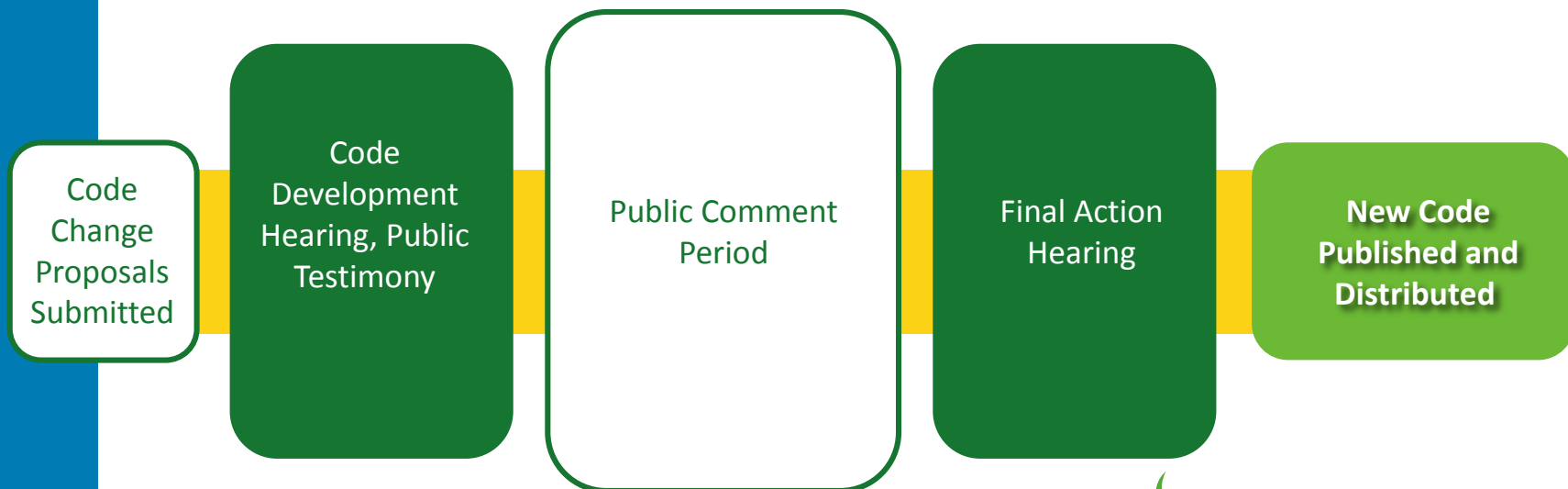


International Energy Conservation Code

International Code Council

Code Development Process

- New Code Published Every Three Years
- Amendments Accepted from All Parties
- Proponents and Opponents Given Opportunity to Present Case



Adoption Process

- Some States Adopt Statewide Codes through an Administrative Process
 - Approval by regulatory agency and legislative committee
- Model codes may be amended
- Typical Stakeholders
 - Code officials (state and local), State Energy Office, builders, architects, engineers, energy advocates, environmental advocates, utilities, manufacturers, construction trades, policymakers, energy raters

Purview of Code

Residential and Commercial Buildings

- Residential Code:
 - 3 stories or less
 - Residential use
- Commercial Code:
 - All non-residential buildings
 - Residential 4 stories or more
- Both Codes apply to:
 - New Construction
 - Existing Buildings - additions and major alterations
 - Several exceptions, including historic buildings and minor repairs

Key Measures

Residential Energy Code

- Basement/Foundation Insulation
- Wall Insulation
- Ceiling Insulation
- Window U-factor
- Duct Insulation
- Duct Leakage
- Ventilation
- Air Leakage
- High Efficacy Lighting
- Alternative Compliance Paths

Energy Code

Compliance Options

Residential & Commercial

- Prescriptive Path
- UA Tradeoff – REScheck/
COMcheck
- Performance Path – Energy
Modeling

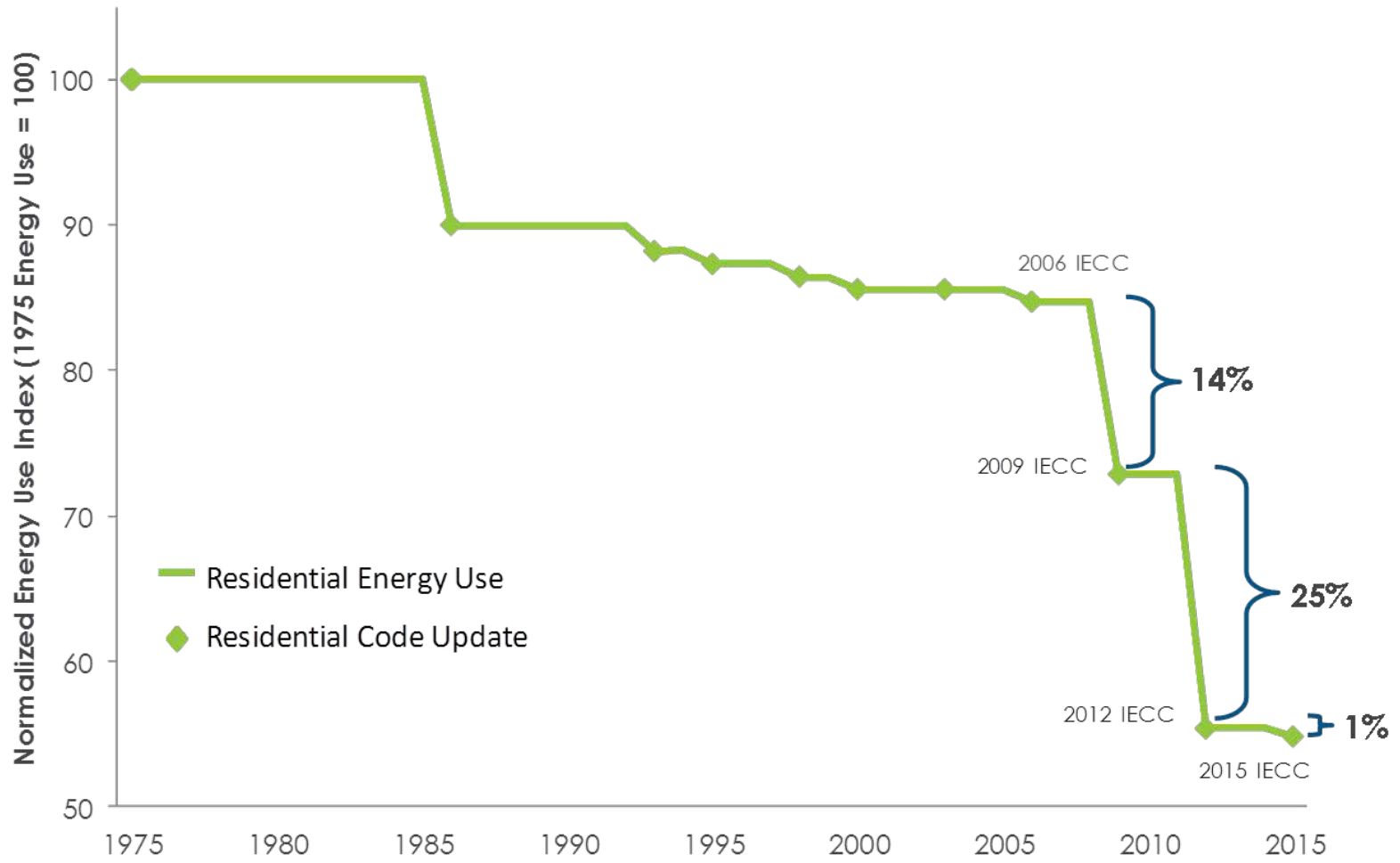
Residential Only:

2015 – 2018 IECC only

- Energy Rating Index – R406

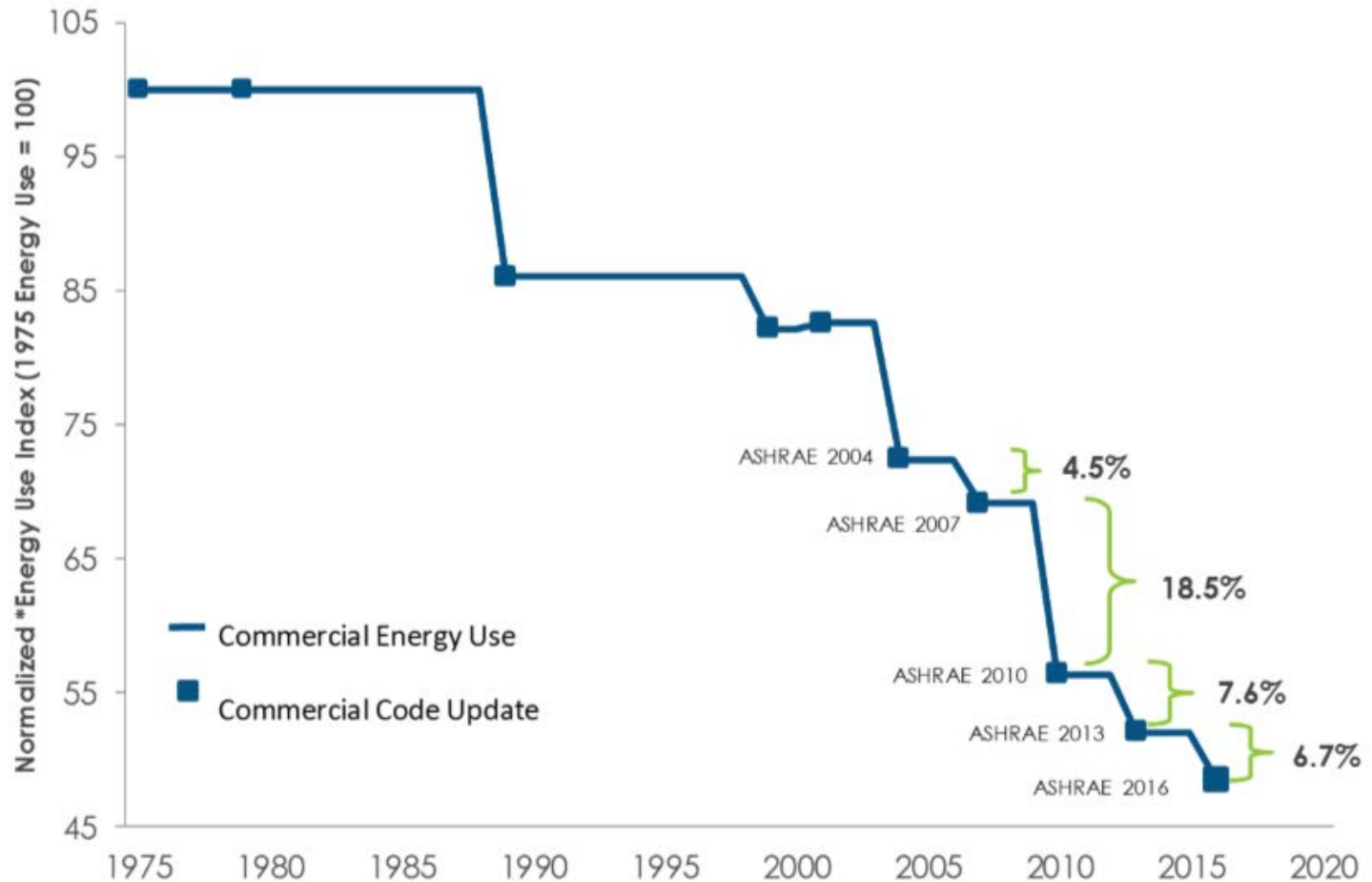
Residential Energy Savings

Energy Use as Code Improves (1975-2015)



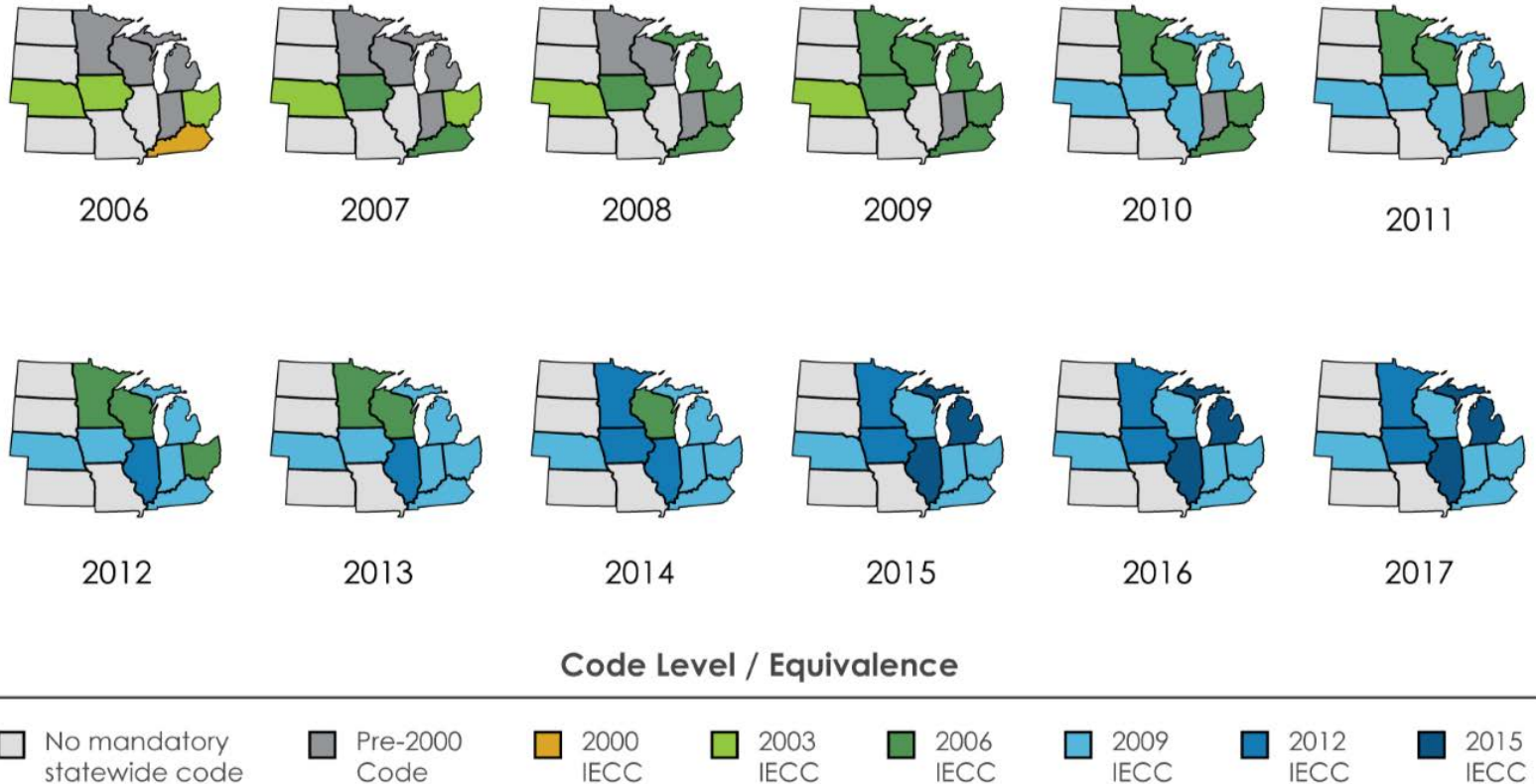
Commercial Energy Savings

Energy Use as Code Improves (1975-2015)



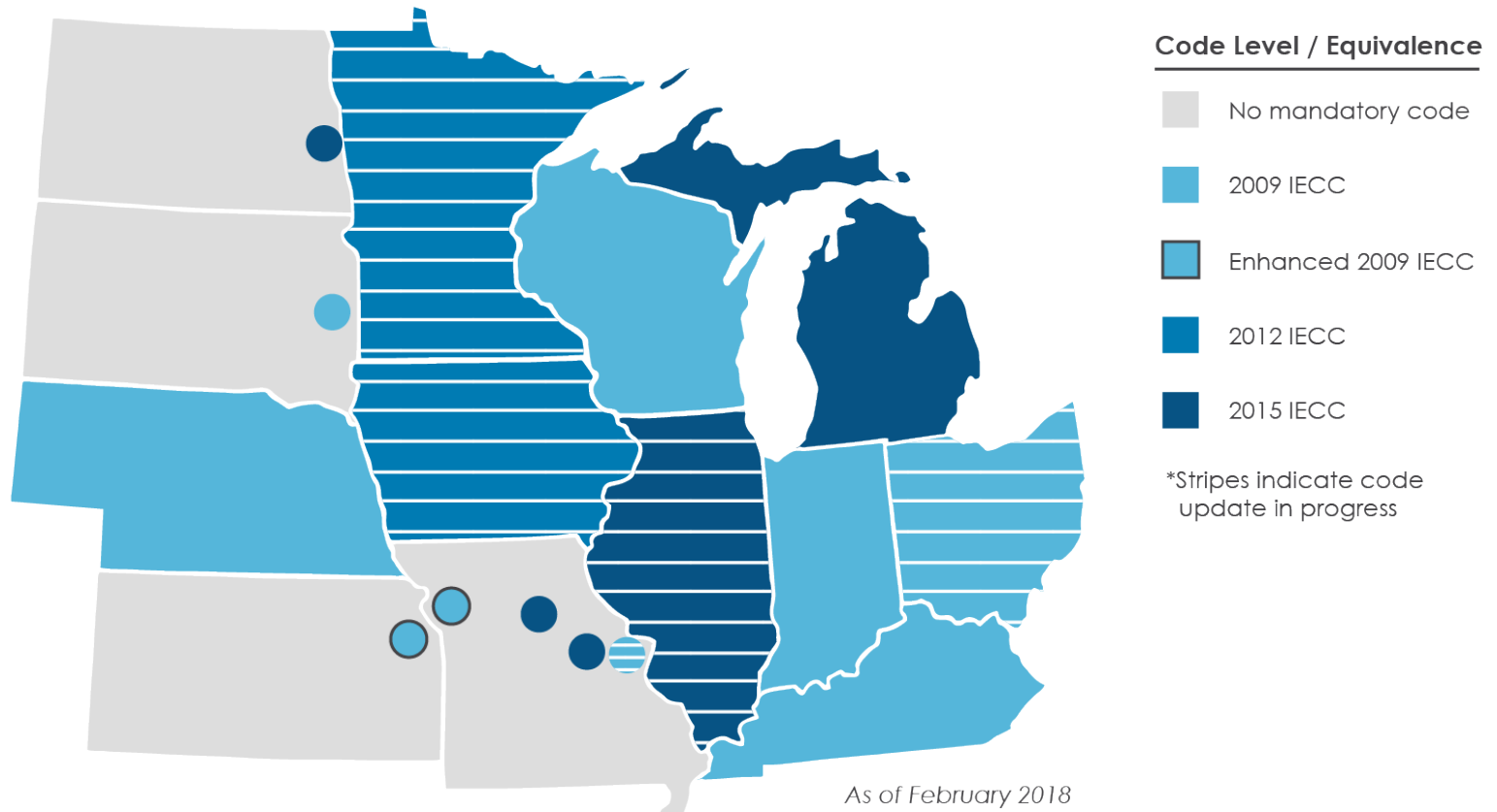
Residential Building Energy Code Adoption

Adoption Timeline



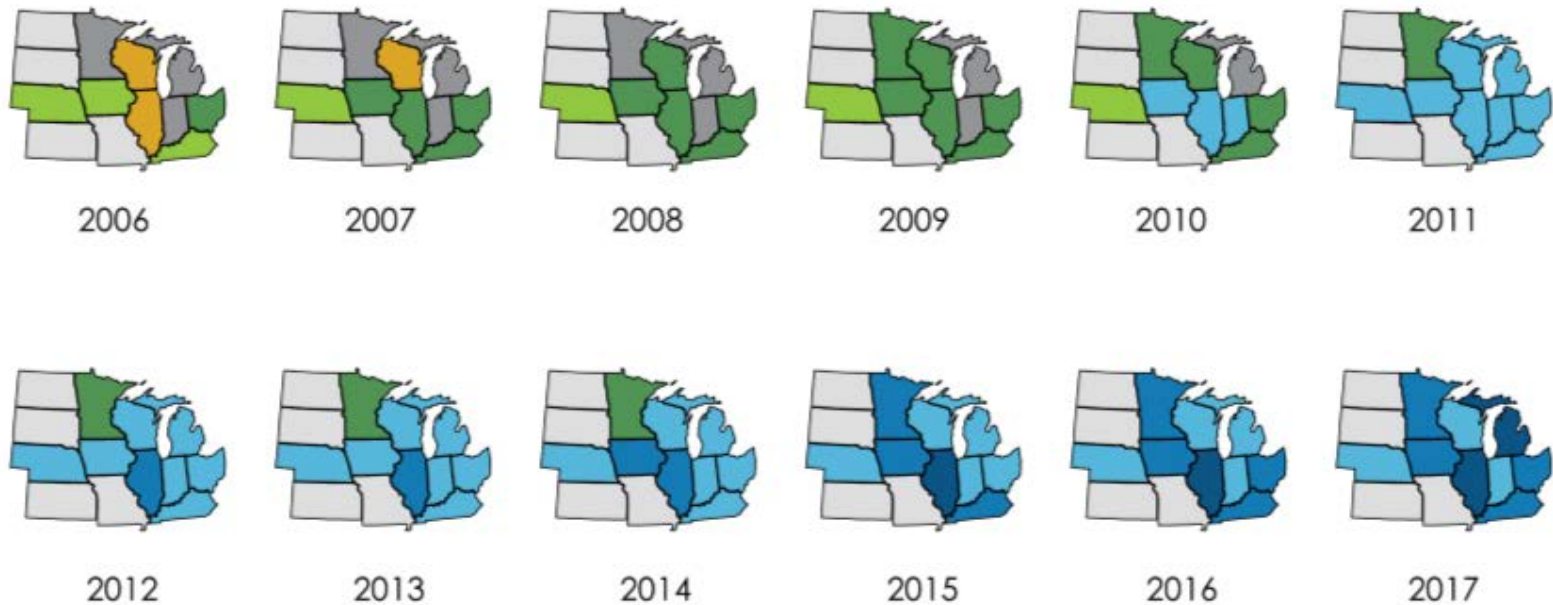
Midwest Energy Code Adoption

Residential Code



Commercial Building Energy Codes

Adoption Timeline

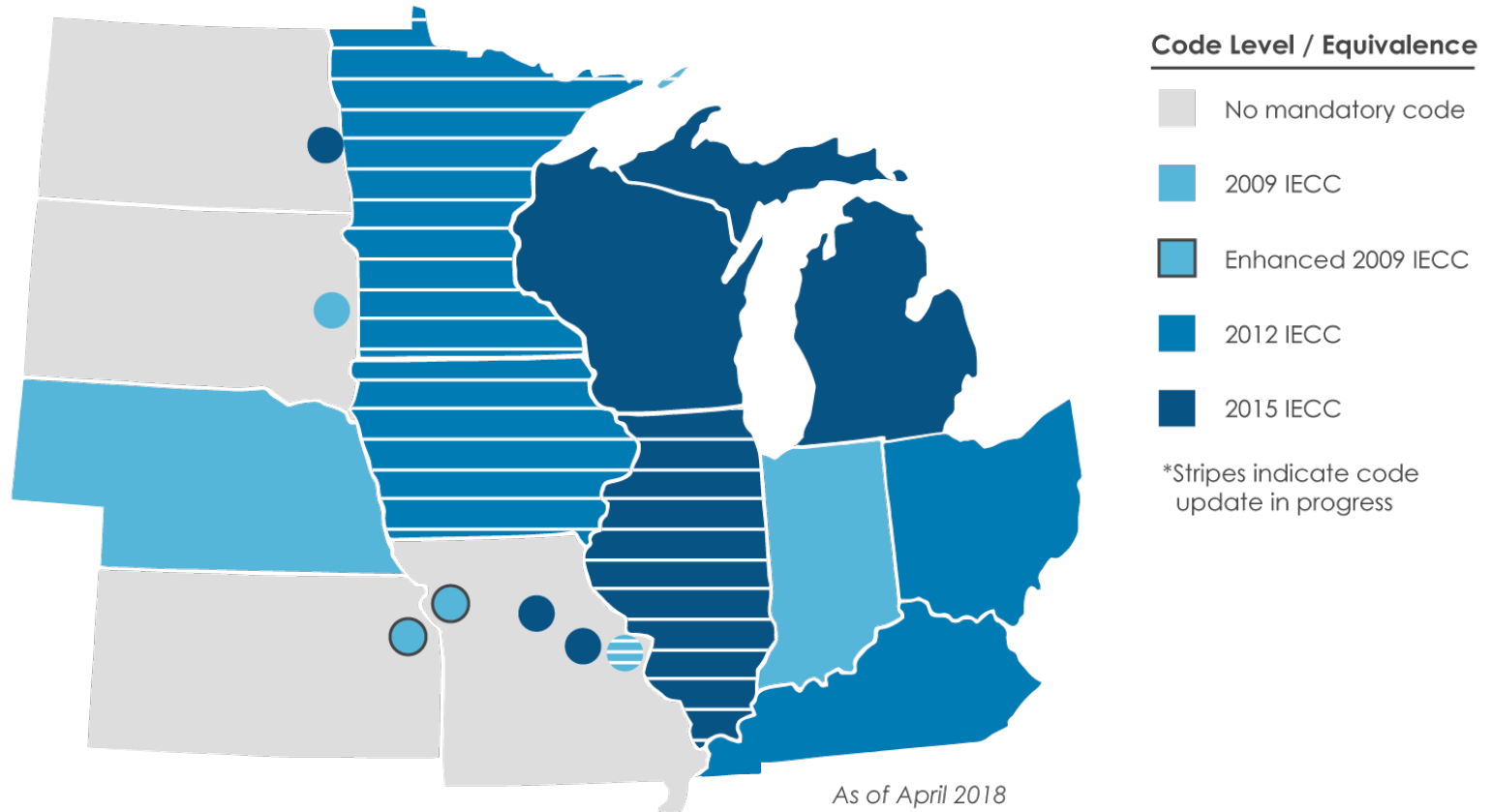


Code Level / Equivalence



Commercial Building Energy Codes

Current Status of Midwest States



Energy Code Enforcement

Who is responsible?

- Building Code Officials perform:
 - Plan Review
 - Field Inspections
- Inspections may be done by third party, with approval by code official
- Reviews and inspections generally done at the local level
- Builders are responsible for complying with the code



Code Compliance

Remains low

- Need for training
 - Builders, Code Officials
- Need for consumer education
- Limited Resources
 - Building Departments traditionally prioritize other sections of the building code



What about Ohio?

Ohio's Commercial Energy Code

2012 IECC/ASHRAE 90.1-2010

- Adopted September 30, 2016
- Effective January 1, 2017
- **Over 18% efficiency improvement** compared to previous code (2009 IECC)
- Annual statewide savings: **\$9.5 million and 470,000 MMBTU**
- **Savings are only realized with compliance**

Significant Improvements

2009 to 2012 IECC

- Increased Insulation and Fenestration Efficiency
- Lighting and Controls
 - New space by space method
- Continuous Air Barrier
- 3rd Party Mechanical System Commissioning Plan
 - Equipment, controls, lighting must be tested
- Air system economizers required on smaller units
- Improved Minimum Efficiency Rating on Mechanical Equipment
- Additional Efficiency Packages added

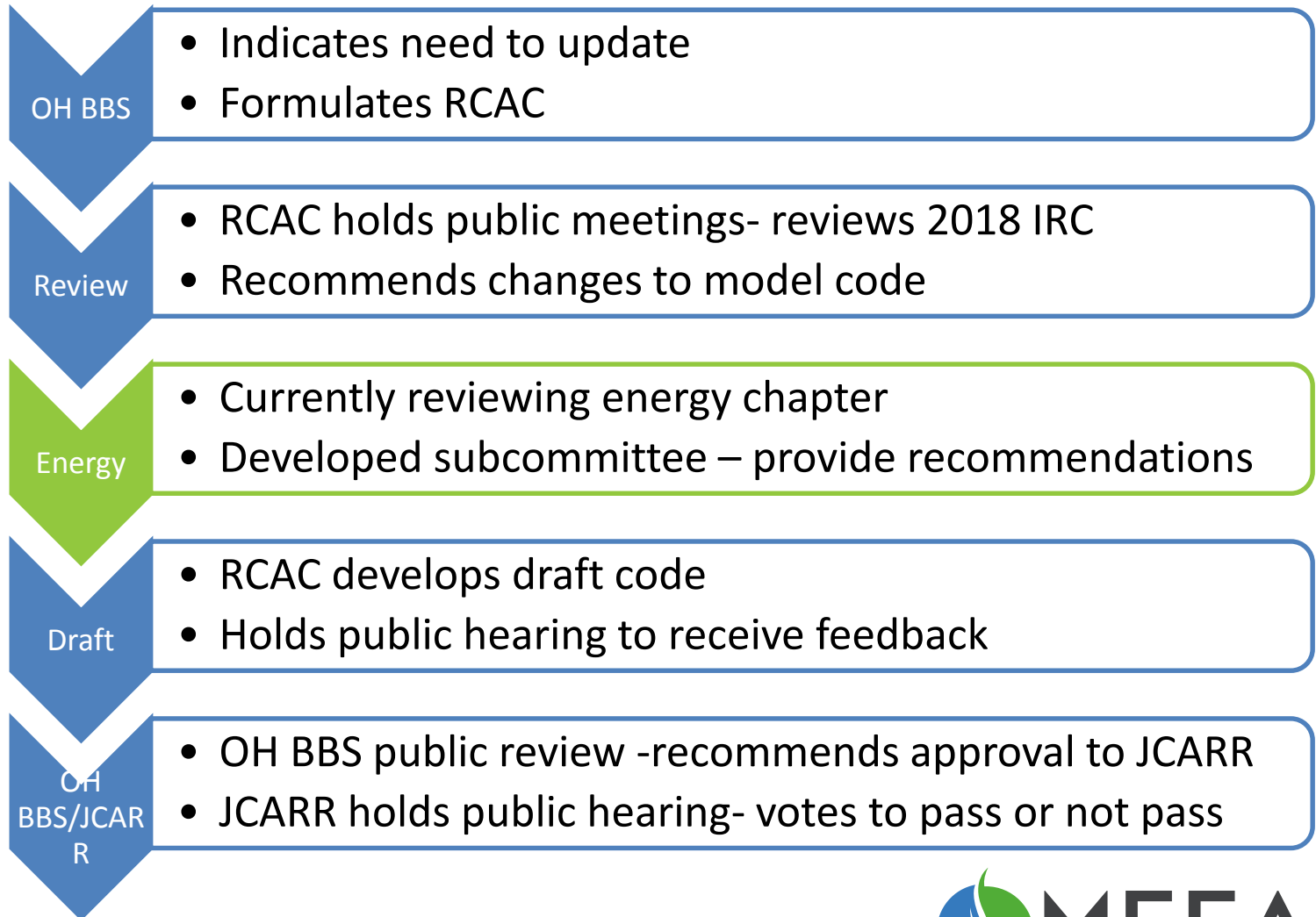
Amendments

How did they change the model code?

- Commercial Buildings
 - Removed requirement to include auto-receptacle shutoff
- Residential Buildings
 - Changed scope to exclude R-3 buildings
 - Relaxed air leakage – 4ACH50

Ohio Residential Adoption

Update to 2018 IECC – In Process!!



Potential Energy Savings/Benefits

2009 IECC to 2018 IECC

- **Over 25% efficiency improvement** compared to previous code
- **~ \$500 annual savings** on a new home
- Annual statewide savings: **\$7.9 million and 600k MMBTU**
- Improved indoor air quality
- Better occupant comfort

Significant Improvements

2009 IECC to 2018 IECC

- Increased home tightness & performance testing
- Mandatory whole house mechanical ventilation
- Increased Insulation
- More efficient windows
- 40% increase in efficient lighting
- More options for compliance

Switching Gears

Benchmarking Policies

Energy Benchmarking

What is it?

- Act of tracking energy use and comparing it or “benchmarking to a comparable building
- Municipalities can adopt ordinance to require this on buildings
- Typically this is implemented in tiers
 - Incorporates buildings from large to smaller
- Can create a robust dataset and competition among buildings in a city

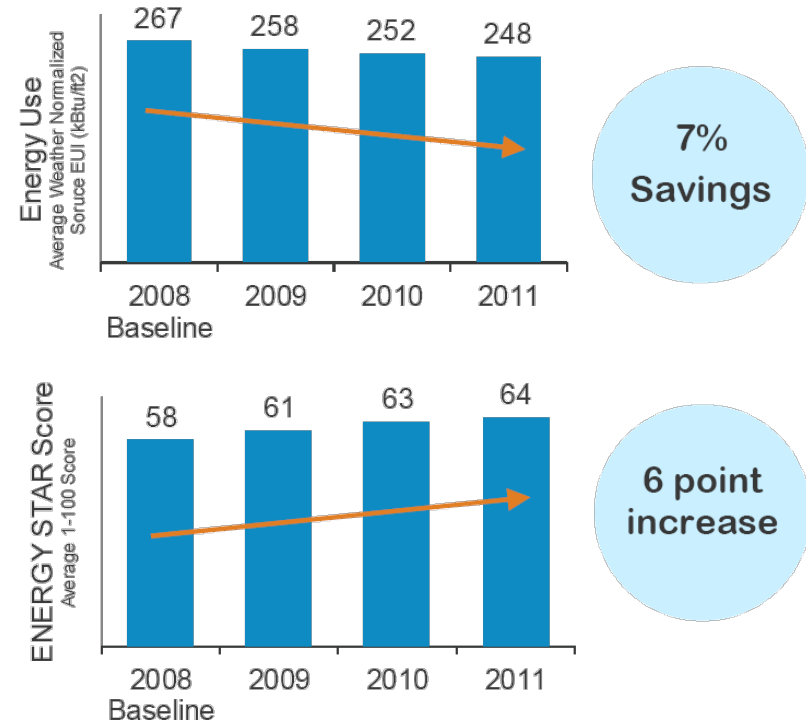
Energy Benchmarking

Value Proposition

You can't manage what you don't measure.

- Consistent benchmarking results in energy savings and improved performance
- Provides information needed to make smart, cost-saving investments
- Helps property and financial markets accurately value energy efficient buildings

Energy Savings in Portfolio Manager



Source:

http://www.energystar.gov/ia/business/downloads/datatrends/DataTrends_Savings_20121002.pdf?8d81-8322

Energy Benchmarking

Good Policy?

Advantages:

- easy, free, large potential gains in energy efficiency (2.5% annual average by benchmarking alone), identifies the buildings with biggest energy savings opportunities, measures energy savings over time

Disadvantages:

- First-time administrative work can be time-consuming, access to energy data

Midwest Energy Benchmarking

Mandatory & Voluntary Policies



Public and Private Commercial Building Benchmarking Ordinances

-  Mandatory Program
 - Minneapolis, MN
 - Chicago, IL
 - Evanston, IL
 - Kansas City, MO
 - St. Louis, MO
-  Voluntary Program
 - Columbus, OH
 - Grand Rapids, MI
 - Madison, WI

Chicago Example

Mandatory Approach

- Adopted September 2013
 - Covers buildings 50,000 sq. ft. or larger
 - 1% of Chicago buildings, ~20% energy use
- Requirements
 - Benchmark energy use annually (ESPM)
 - Verify data every 3 years (3rd Party)
 - Report to City annually
- Training is available and supported

Chicago Example

Utility Data

- Electricity – ComEd
 - Energy Usage Data System (EUDS)
 - Online platform to obtain real-time data
 - One of most sophisticated systems in the US
 - Easy integration with ESPM
- Natural Gas – Peoples Gas
 - Aggregated natural gas usage
 - Opportunity for improvement

Chicago Example

Map of Buildings



CHICAGO ENERGY BENCHMARKING

Address

Neighborhood

Property Type

Property Information

Energy Use

Energy Performance Metrics

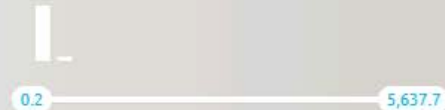
ENERGY STAR Score

MORE INFO



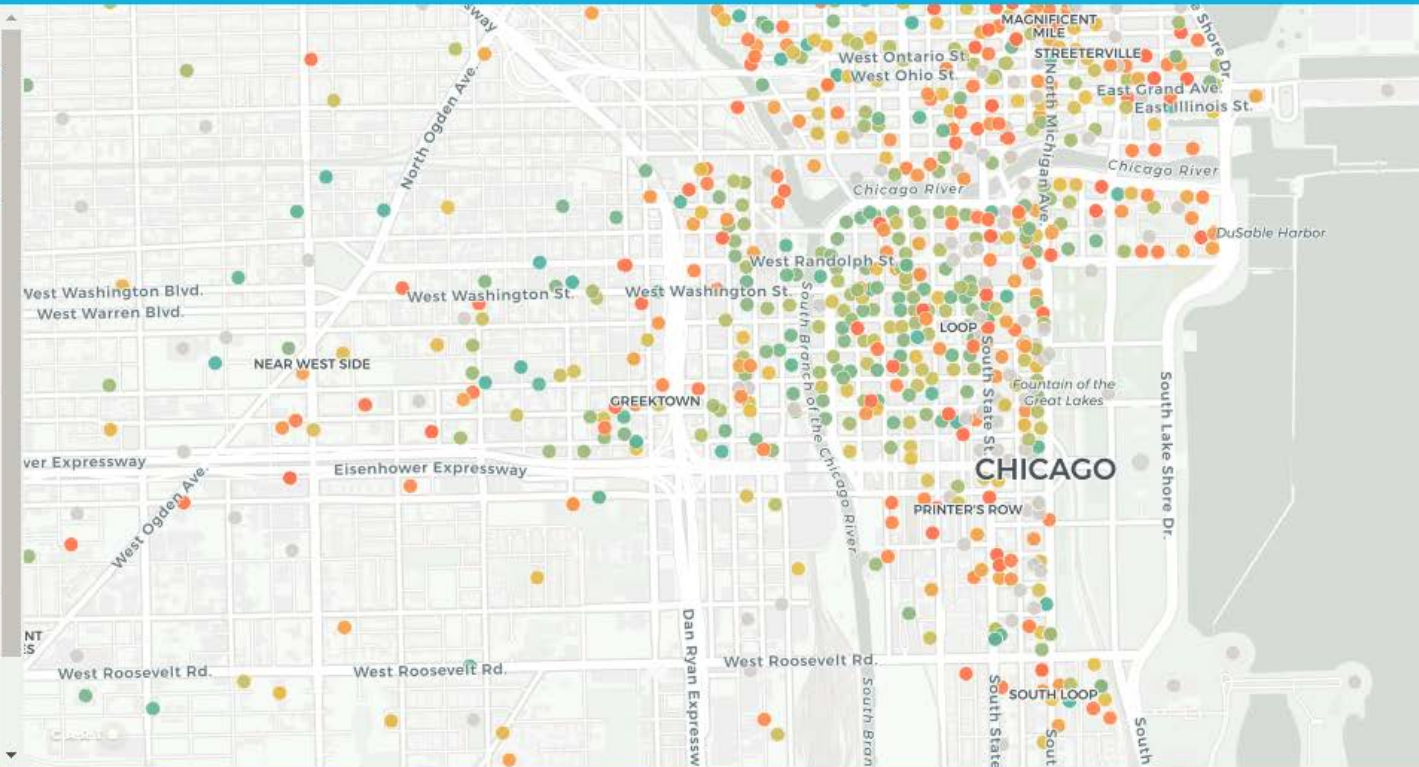
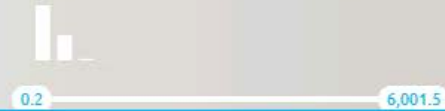
Site Energy Use Intensity

MORE INFO



Source Energy Use Intensity

MORE INFO



BUILDING COMPARISON

ENERGY ST... X

AVERAGES BASED ON RANGES SET IN FILTERS

AVERAGE
65

[Chicago Energy Benchmarking Link](#)

Columbus Example

Voluntary Approach

- Columbus Energy Challenge
 - Free voluntary program for any interested commercial/multifamily building
- Incentive to join
 - Connect with utility rebates
 - Training on ESPM available
 - Free spreadsheet to auto-upload data
- Results
 - Top 3 participants reduced annual energy use by 20%
 - Data from 2015 suggests challenge was well short of goal # of buildings

Conclusion

- Through building policies, lots of opportunity to improve EE and move market
- Codes are improving – what about benchmarking?
- Ohio is slowly catching up with rest of Midwest, but still lagging
- Get involved at local and state level
 - Advocate for building efficiency policies!

Questions?

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