

# **Matters of the Heartland: Sustainable Advocacy in the Midwest**

October 5, 2022 1:30 PM

1.0 Learning Units

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# Acknowledgements / Credits

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Stewart Whitcomb, AIA

Sarah Wood, AIA





# Speakers List



**Joseph Yount,  
AIA**

RATIO



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Ball State University  
/ Browning Day



**Jennifer Miller,  
AIA**

DELV Design



**COTE**

Committee on the Environment

**REBUILD**

# Learning Objectives

**Objective 1:** Describe the current regulatory impediments to code updates in Indiana and much of the U.S. Midwest.

**Objective 2:** Explain how model energy standards and codes are shifting toward increased energy efficiency and will eventually require zero net energy buildings.

**Objective 3:** Define energy benchmarking and how it can create competition and opportunity in the marketplace for high-performance design and deep energy retrofits.

**Objective 4:** Identify numerous environmental and economic benefits of regularly-updated building codes.

*Submitted for 1 AIA HSW LU*

# Session Roadmap

**A** Prelude

**B** Act I: The State

**C** Act II: The City

**D** Act III: The Practice

**E** Discussion



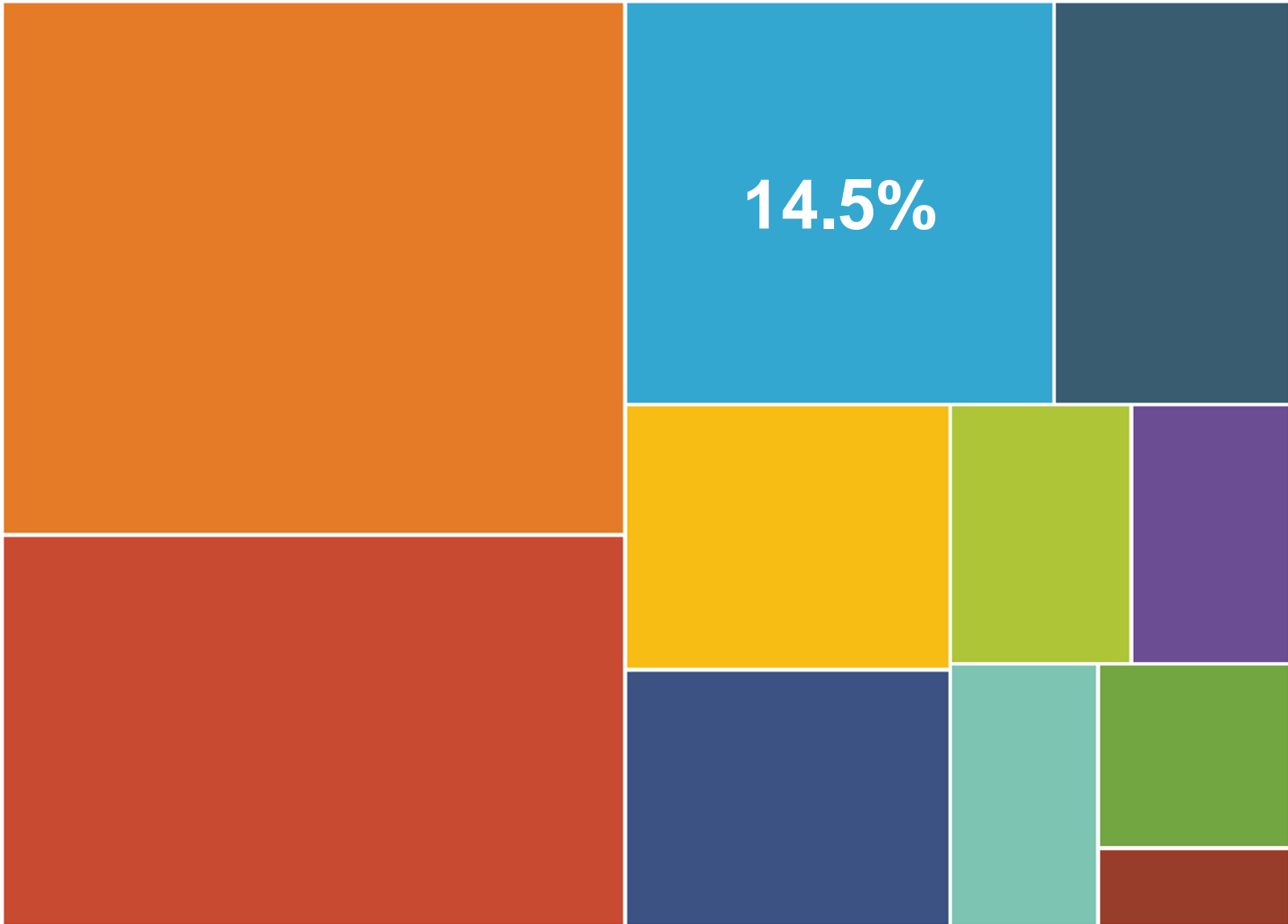


**Prelude**

**We're on a global carbon binge.**





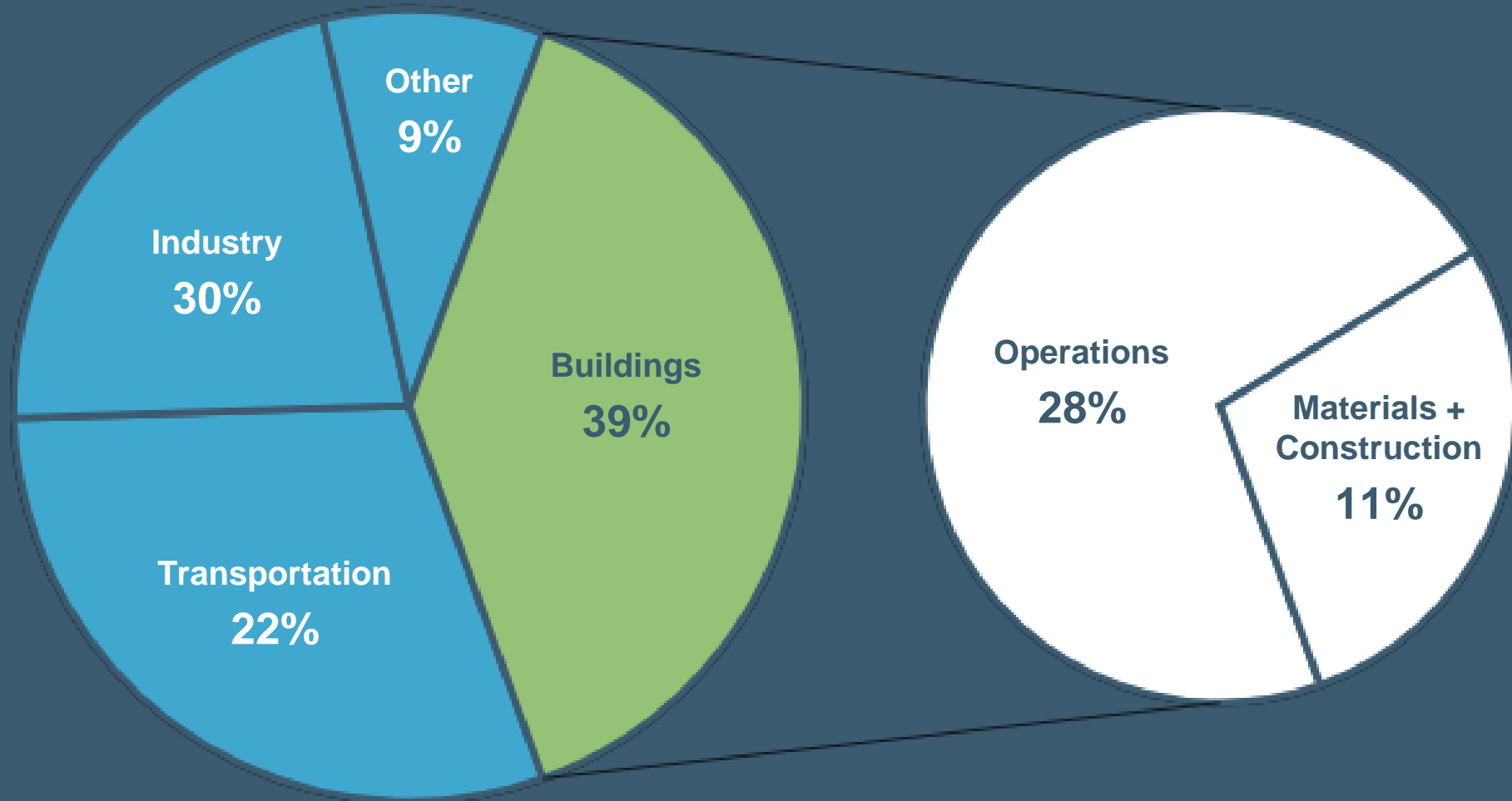


<b>China</b>	<b>10.17 B</b>
<b>Asia (excl. China &amp; India)</b>	<b>7.45 B</b>
<b>United States</b>	<b>5.28 B</b>
<b>EU-27</b>	<b>2.92 B</b>
<b>India</b>	<b>2.62 B</b>
<b>Europe (excl. EU-27)</b>	<b>2.54 B</b>
<b>Africa</b>	<b>1.43 B</b>
<b>International Transport</b>	<b>1.26 B</b>
<b>North America (excl. USA)</b>	<b>1.19 B</b>
<b>South America</b>	<b>1.09 B</b>
<b>Oceania</b>	<b>0.47 B</b>

**36.42 Billion Tonnes CO2 / Year**

Source: Our World in Data, 2020;  
Global Carbon Project

# Global CO2 Emissions by Sector



# AIA Indiana wrestles with the AIA 2030 Commitment

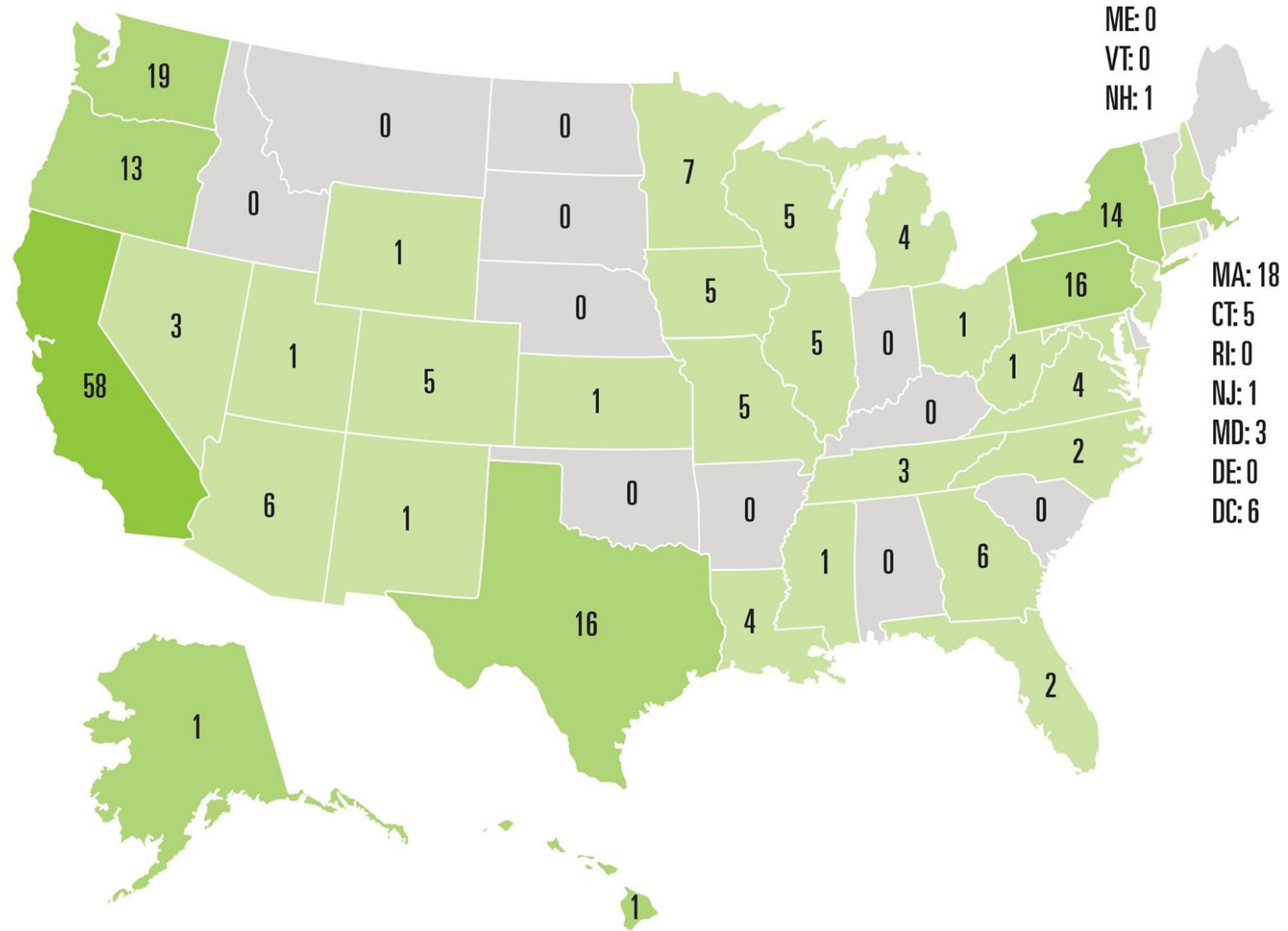
**AIA Indiana's COTE started as a 2030 Commitment Support Group.**

Started by representatives from 5 Indiana firms who had joined the **AIA 2030 Commitment** – a voluntary initiative to reach net-zero carbon design across a firm's portfolio by the year 2030.

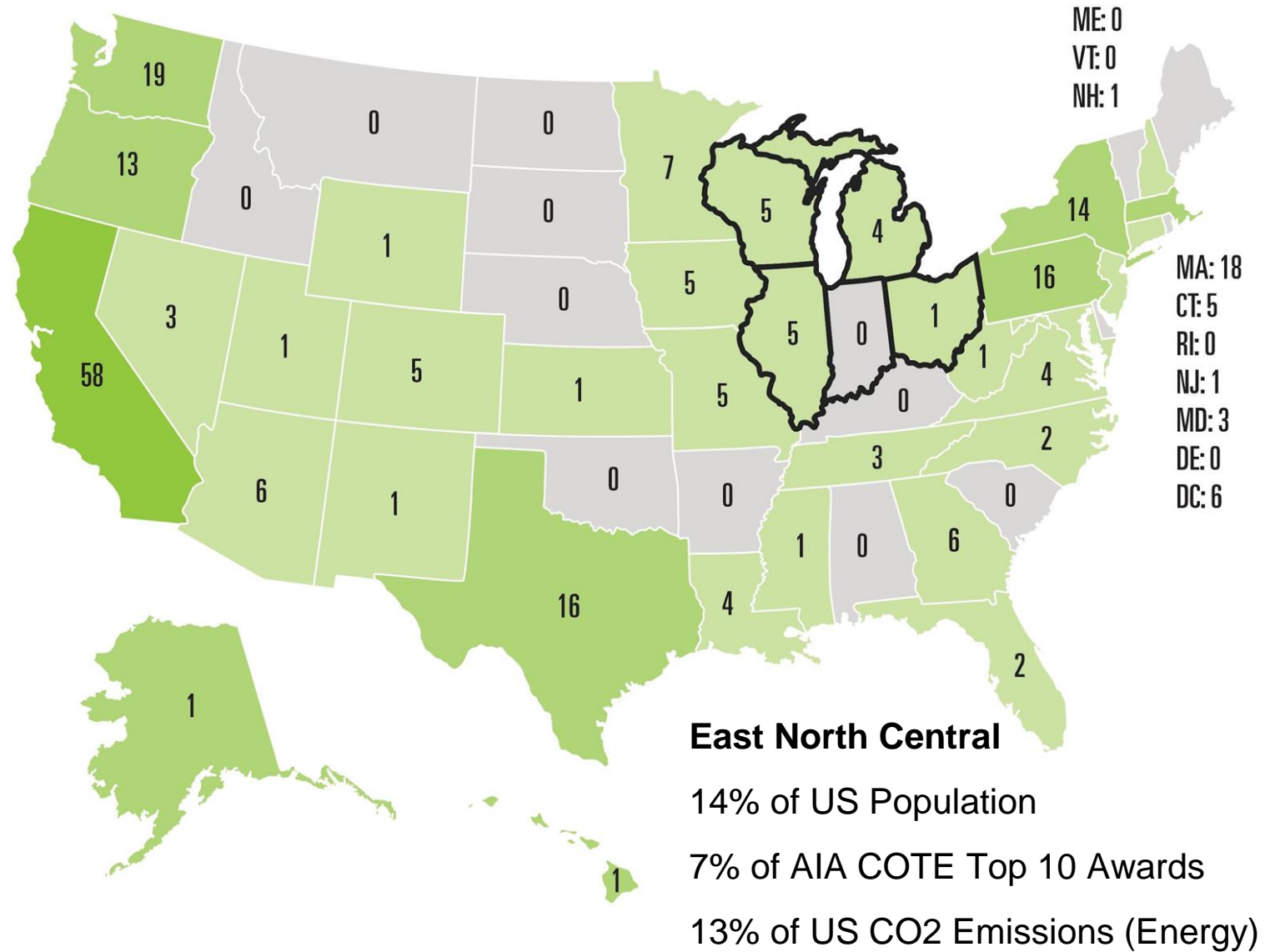
Despite having some very knowledgeable respected industry leaders in our group, we all found that we faced similar challenges in translating this knowledge into practice.



# AIA National COTE Top 10 Awards



# AIA National COTE Top 10 Awards





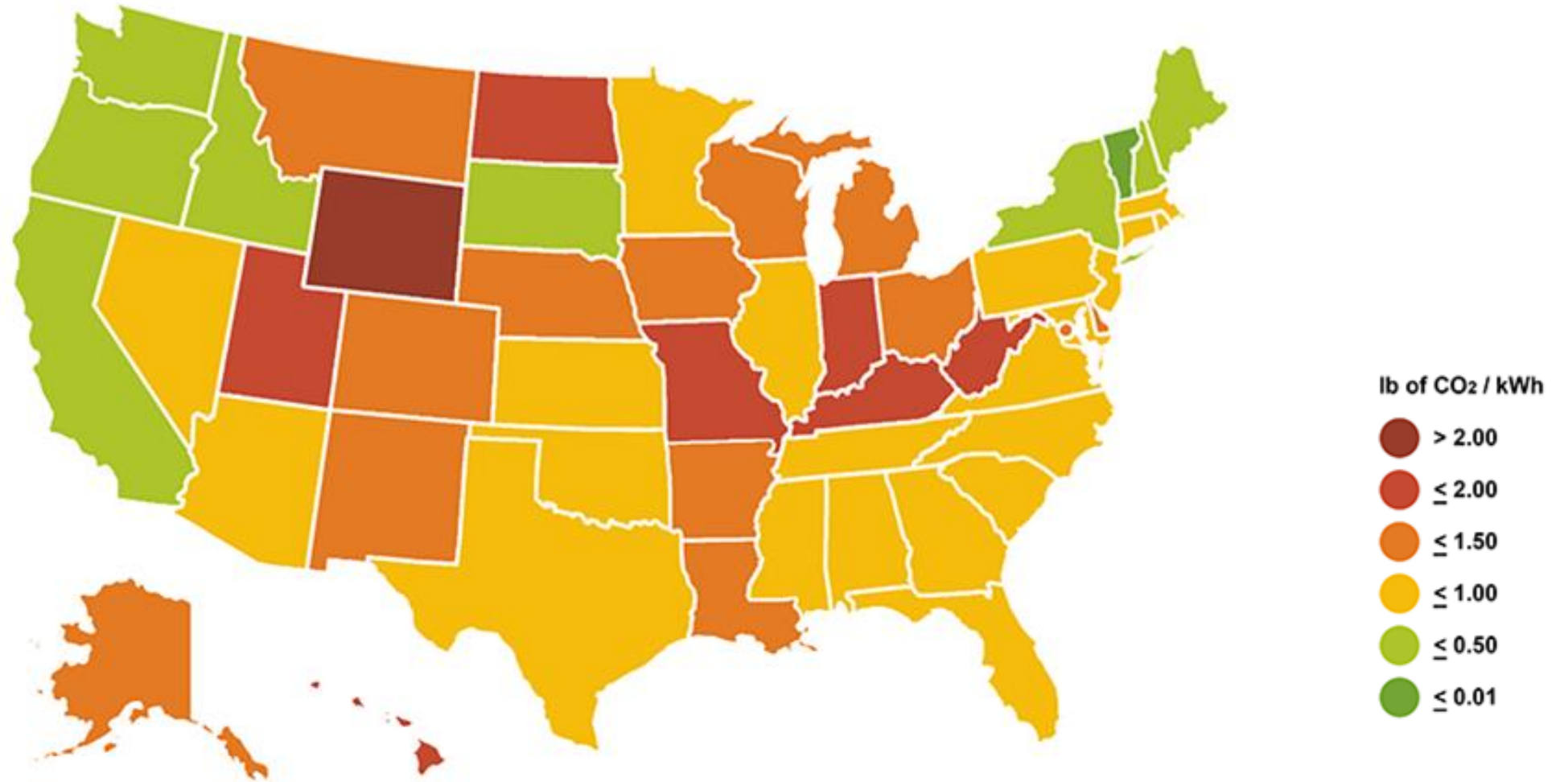








# CO2 Emissions per Kilowatt-Hour per State



Rank	State	lb CO2 / kWh
1	Vermont	0.006
2	New Hampshire	0.238
3	Idaho	0.274
4	Washington	0.302
5	Maine	0.382
6	Oregon	0.390
7	New York	0.415
8	California	0.446
9	South Dakota	0.499
10	Connecticut	0.523
11	South Carolina	0.552
12	New Jersey	0.585
13	Virginia	0.681
14	Oklahoma	0.729
15	Tennessee	0.730
16	Maryland	0.733
17	Pennsylvania	0.743
18	Illinois	0.752
19	Nevada	0.768
20	Alabama	0.784
21	North Carolina	0.795
22	Mississippi	0.834
23	Arizona	0.844

Rank	State	lb CO2 / kWh
31	Iowa	1.034
32	Louisiana	1.057
33	Michigan	1.079
34	Delaware	1.109
35	Arkansas	1.110
36	Wisconsin	1.233
37	Ohio	1.249
38	Alaska	1.258
39	New Mexico	1.275
40	Montana	1.294
41	Colorado	1.324
42	District of Columbia	1.393
43	Nebraska	1.396
44	North Dakota	1.533
45	Utah	1.593
46	Missouri	1.616
47	Hawaii	1.656
48	Indiana	1.671
49	Kentucky	1.802
50	West Virginia	1.956
51	Wyoming	2.046
<b>US Average</b>		<b>0.919</b>

# Most Suitable Zone for Humans



# Most Suitable Zone for Humans – Moderate Emissions

RCP 1.9 (1.5C/2.7F – PARIS)

**RCP 4.5 (2.5C/4.5F)**

RCP 8.5 (5.0C/9.0F)





# Most Suitable Zone for Humans

RCP 1.9 (1.5C/2.7F – PARIS)

RCP 4.5 (2.5C/4.5F)

RCP 8.5 (5.0C/9.0F)



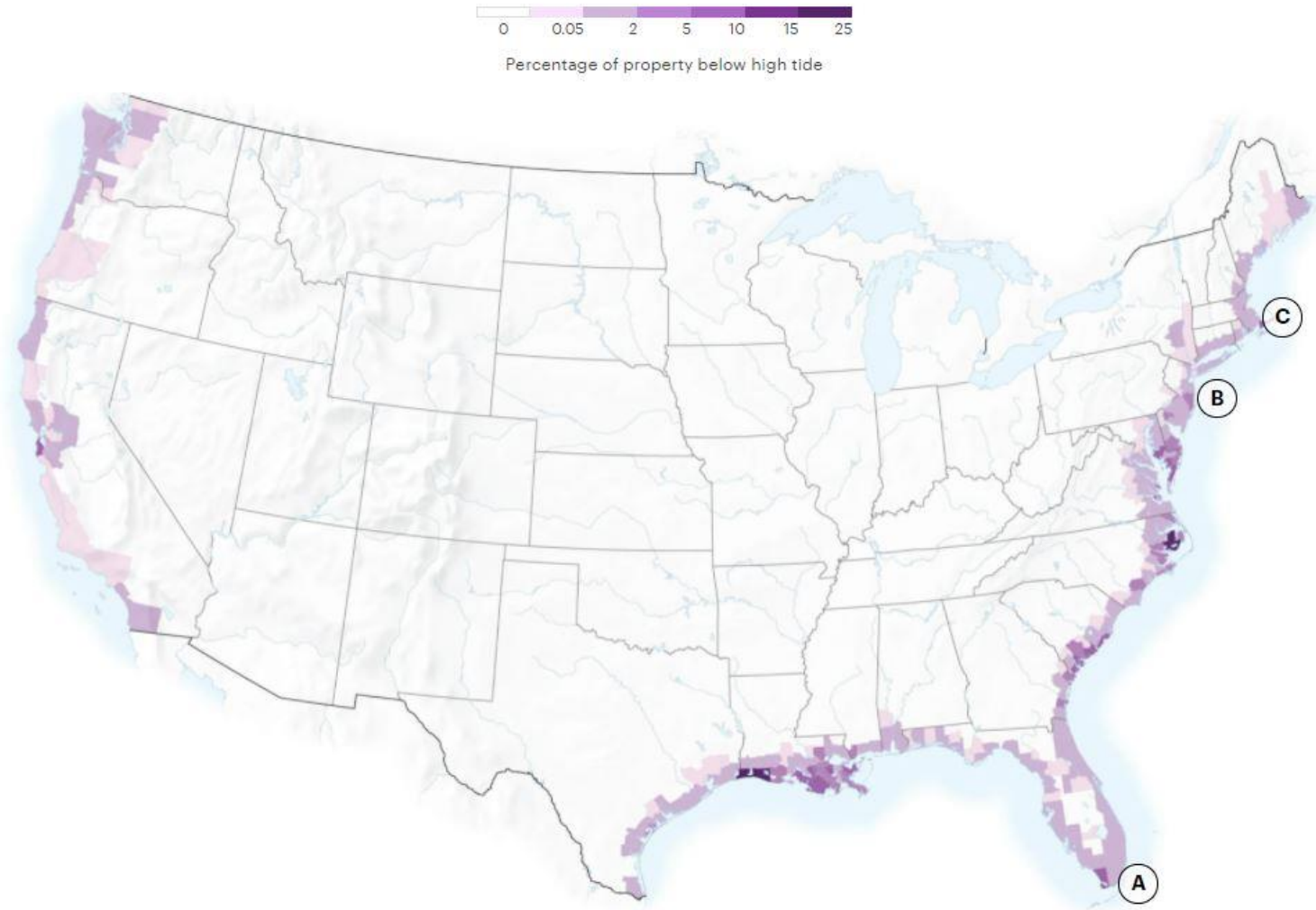
In the case of extreme warming (represented as RCP 8.5), the niche moves sharply toward Canada, leaving much of the lower half of the U.S. too hot or dry for the type of climate humans historically have lived in. Both scenarios suggest massive upheavals in where Americans currently live and grow food.

# Coastline Erosion

RCP 1.9 (1.5C/2.7F – PARIS)

RCP 4.5 (2.5C/4.5F)

**RCP 8.5 (5.0C/9.0F)**

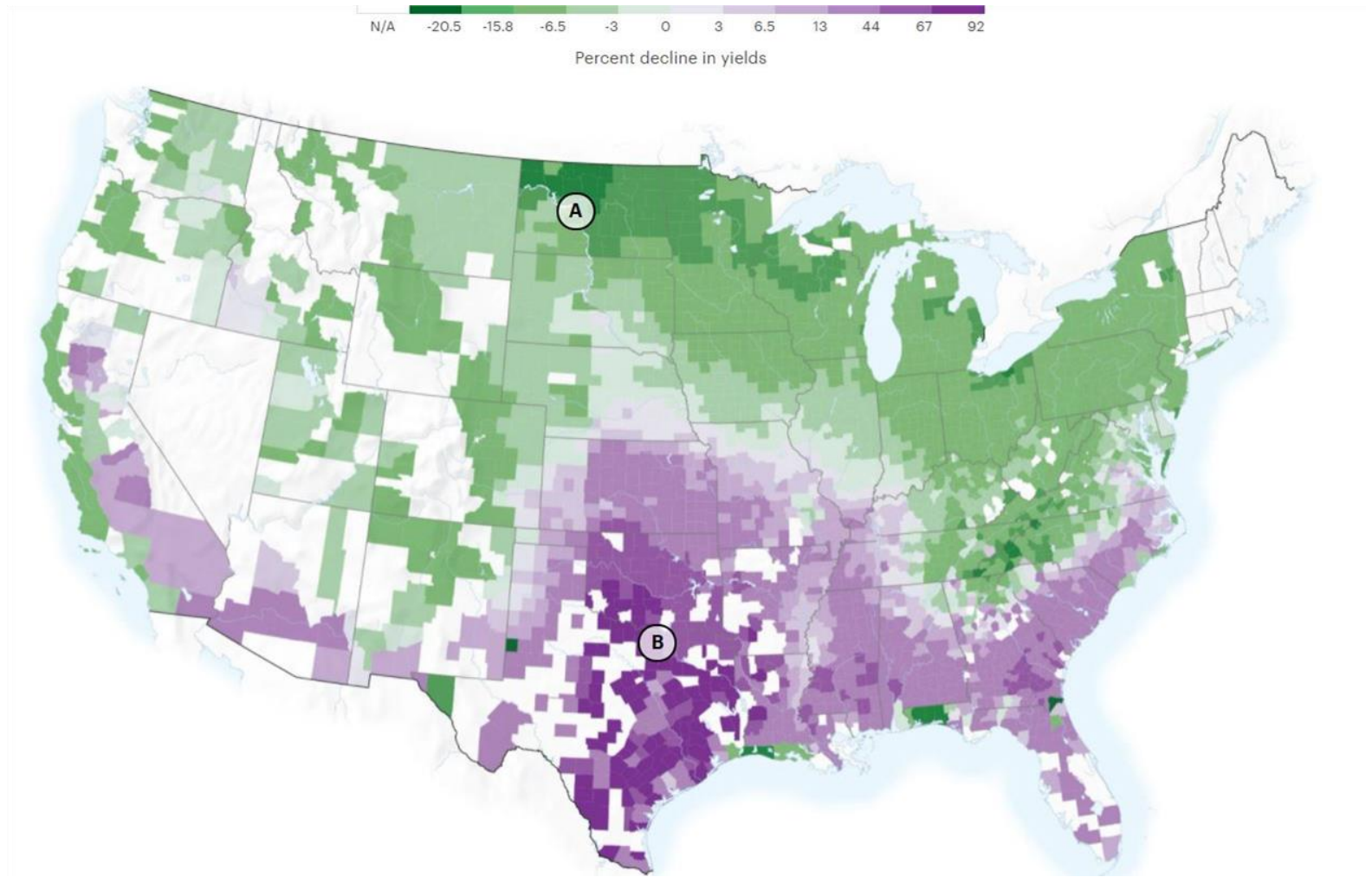


# Crop Yield

RCP 1.9 (1.5C/2.7F – PARIS)

RCP 4.5 (2.5C/4.5F)

RCP 8.5 (5.0C/9.0F)

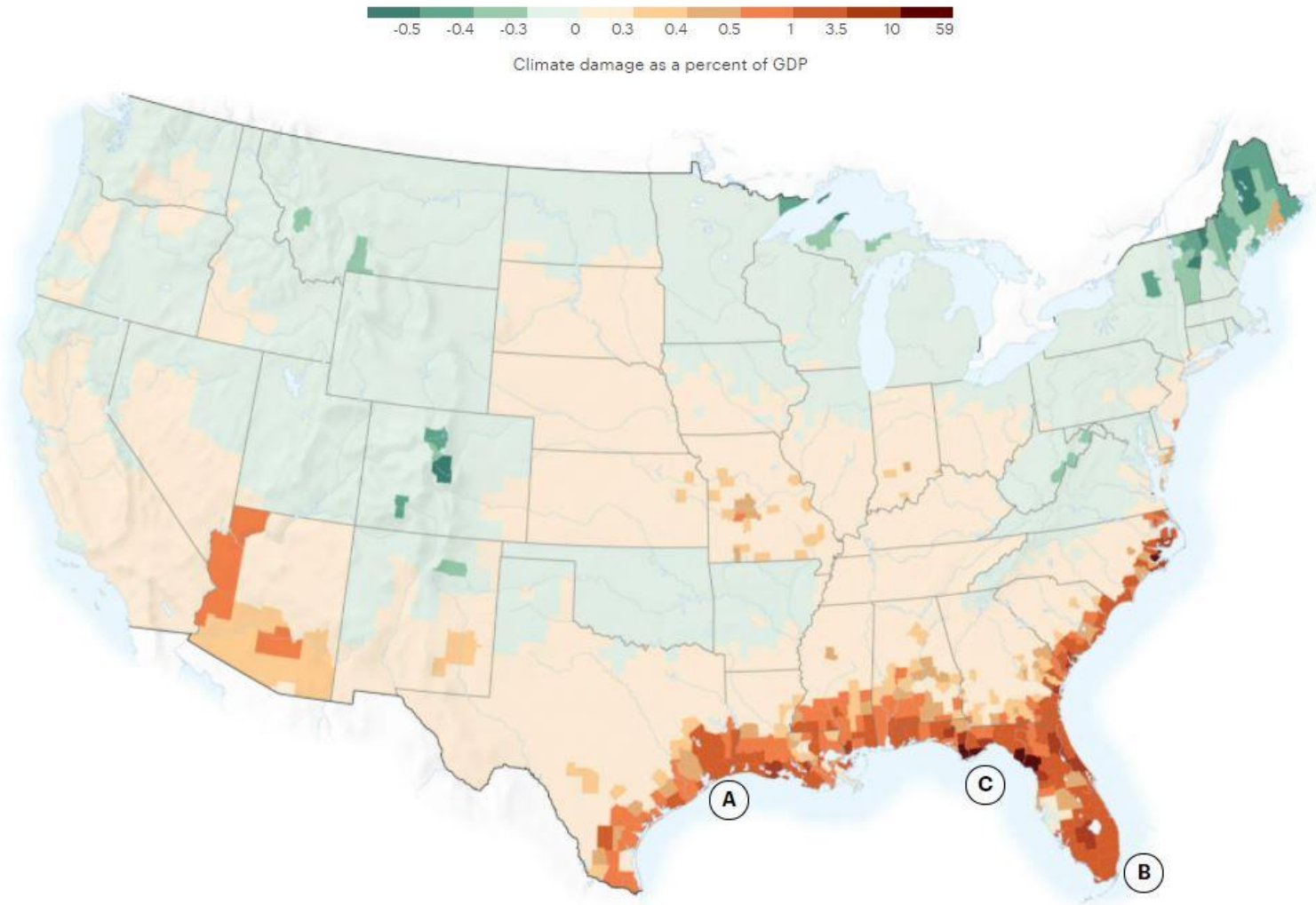


# Economic Impact

RCP 1.9 (1.5C/2.7F – PARIS)

RCP 4.5 (2.5C/4.5F)

RCP 8.5 (5.0C/9.0F)

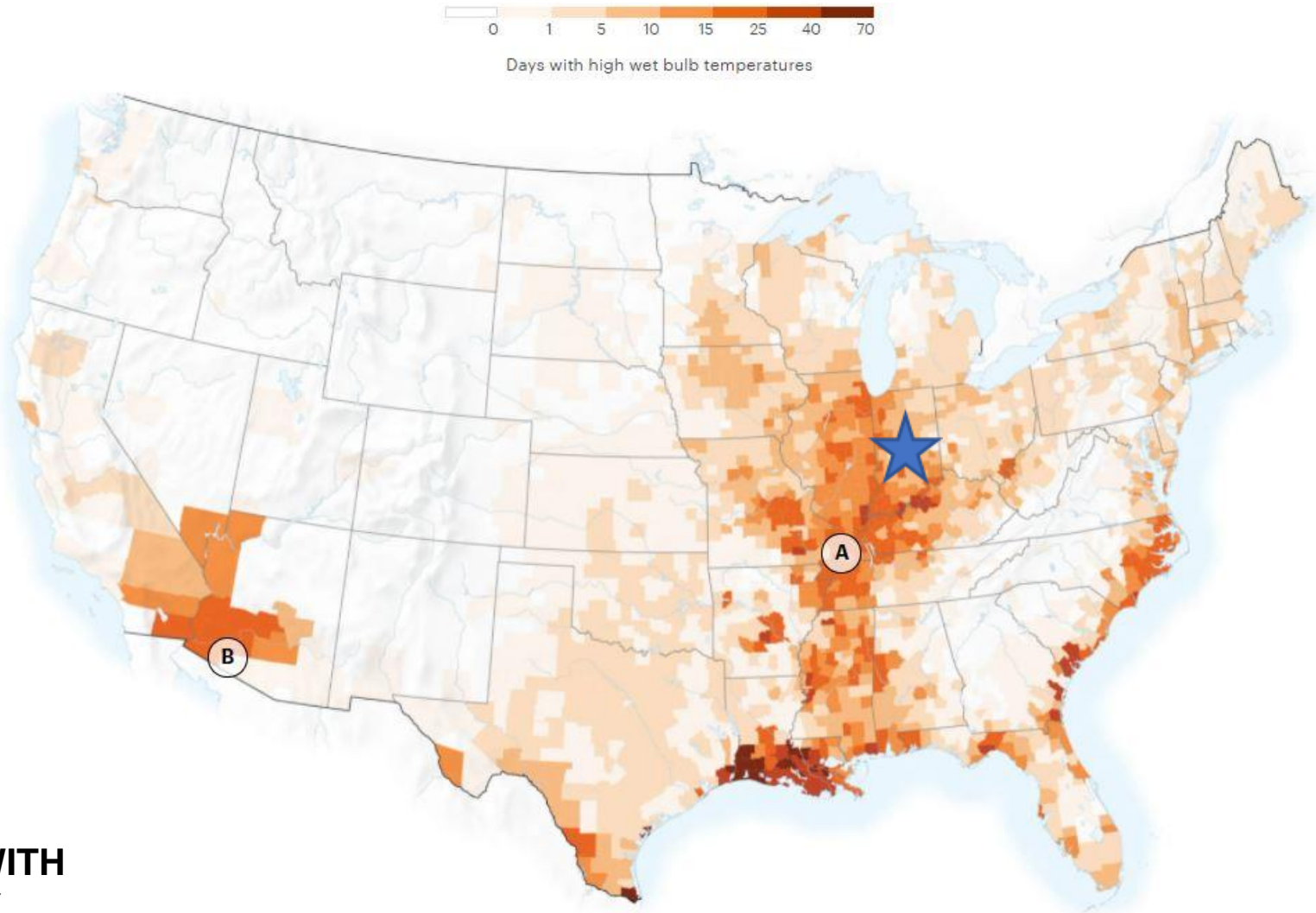


# Heat & Humidity – High Emissions

RCP 1.9 (1.5C/2.7F – PARIS)

RCP 4.5 (2.5C/4.5F)

RCP 8.5 (5.0C/9.0F)



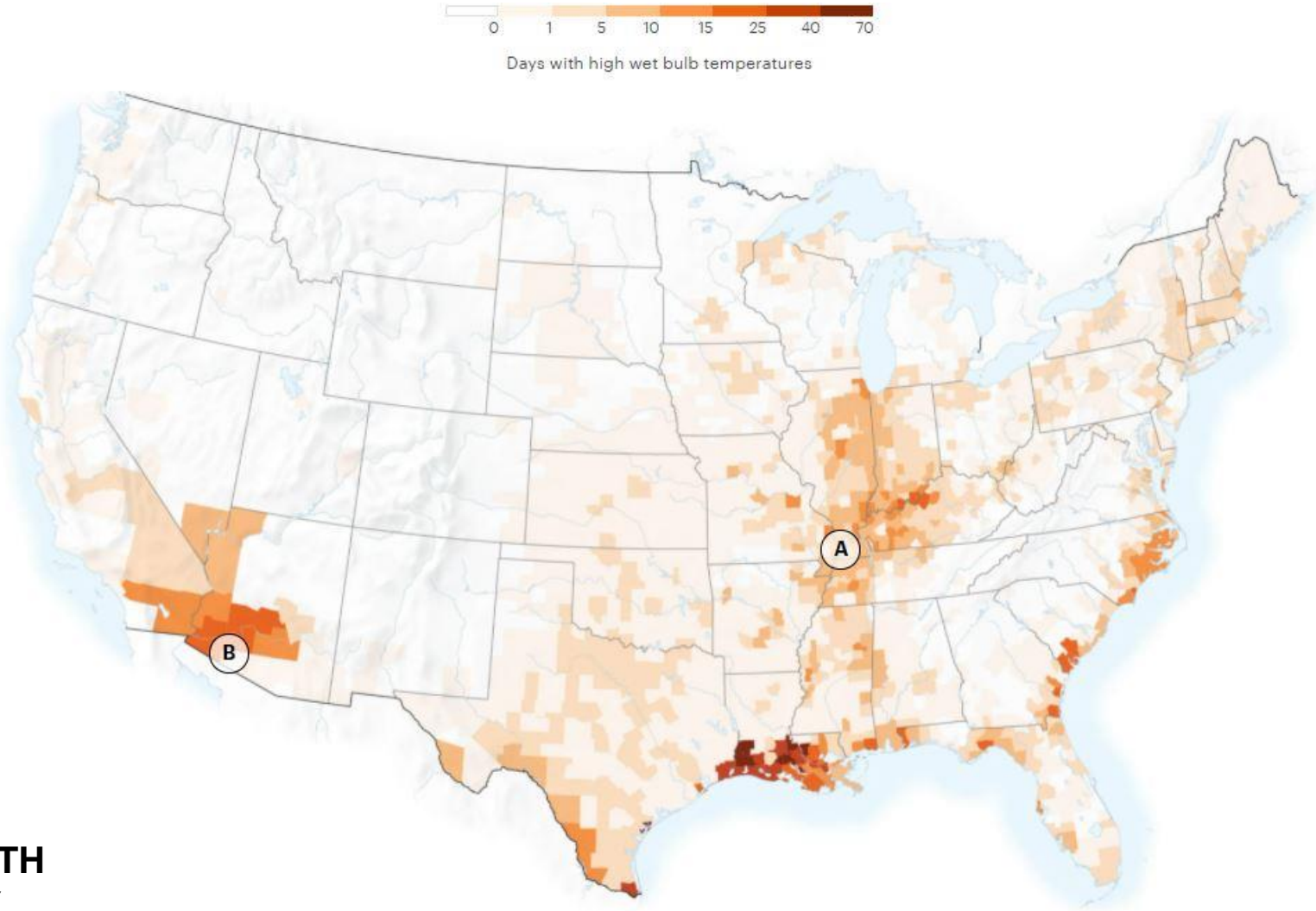
**INDIANAPOLIS: 5-10 DAYS WITH  
EXTREME HEAT & HUMIDITY**

# Heat & Humidity – Moderate Emissions

RCP 1.9 (1.5C/2.7F – PARIS)

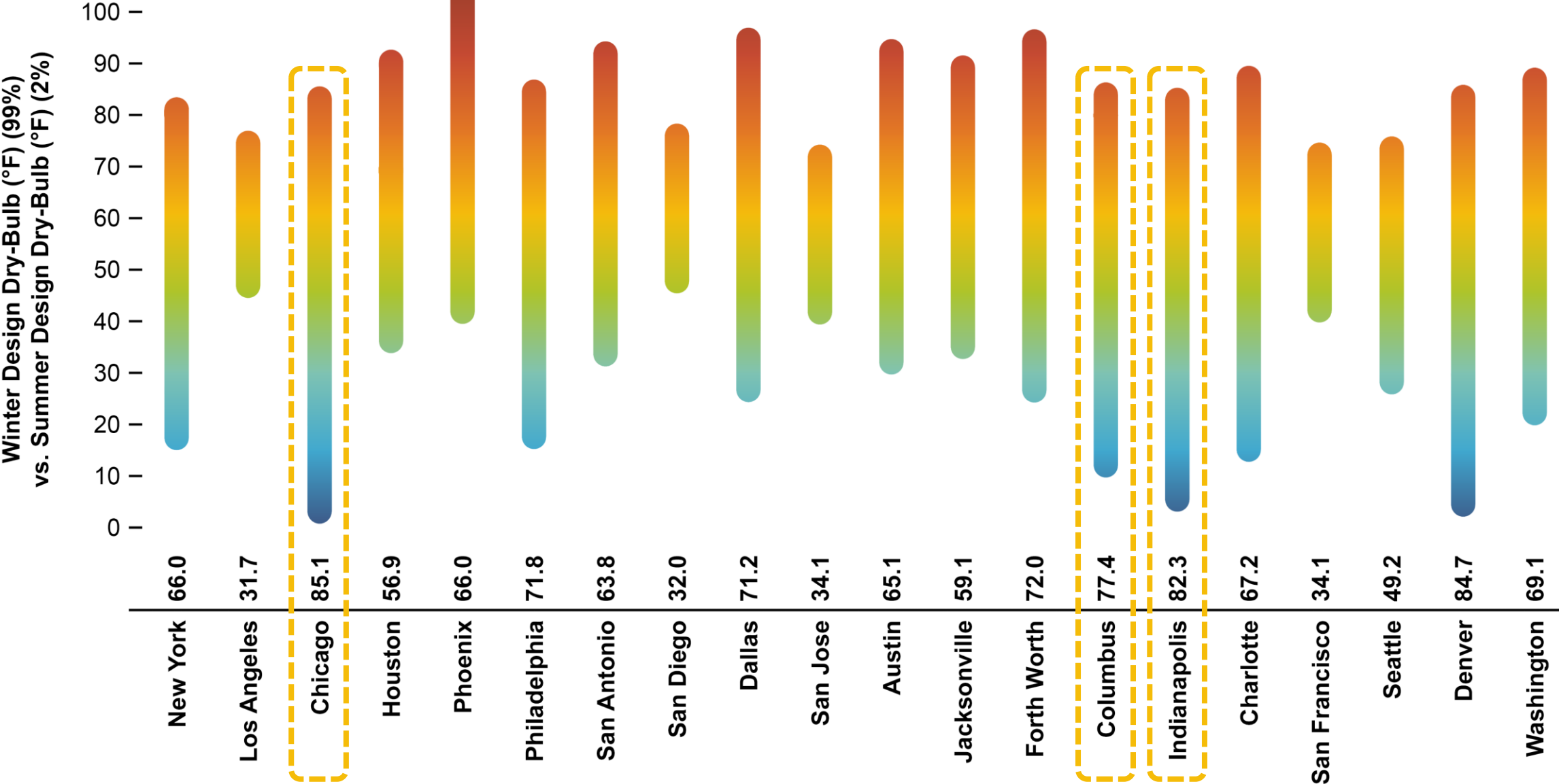
RCP 4.5 (2.5C/4.5F)

RCP 8.5 (5.0C/9.0F)



**INDIANAPOLIS: 1-5 DAYS WITH  
EXTREME HEAT & HUMIDITY**

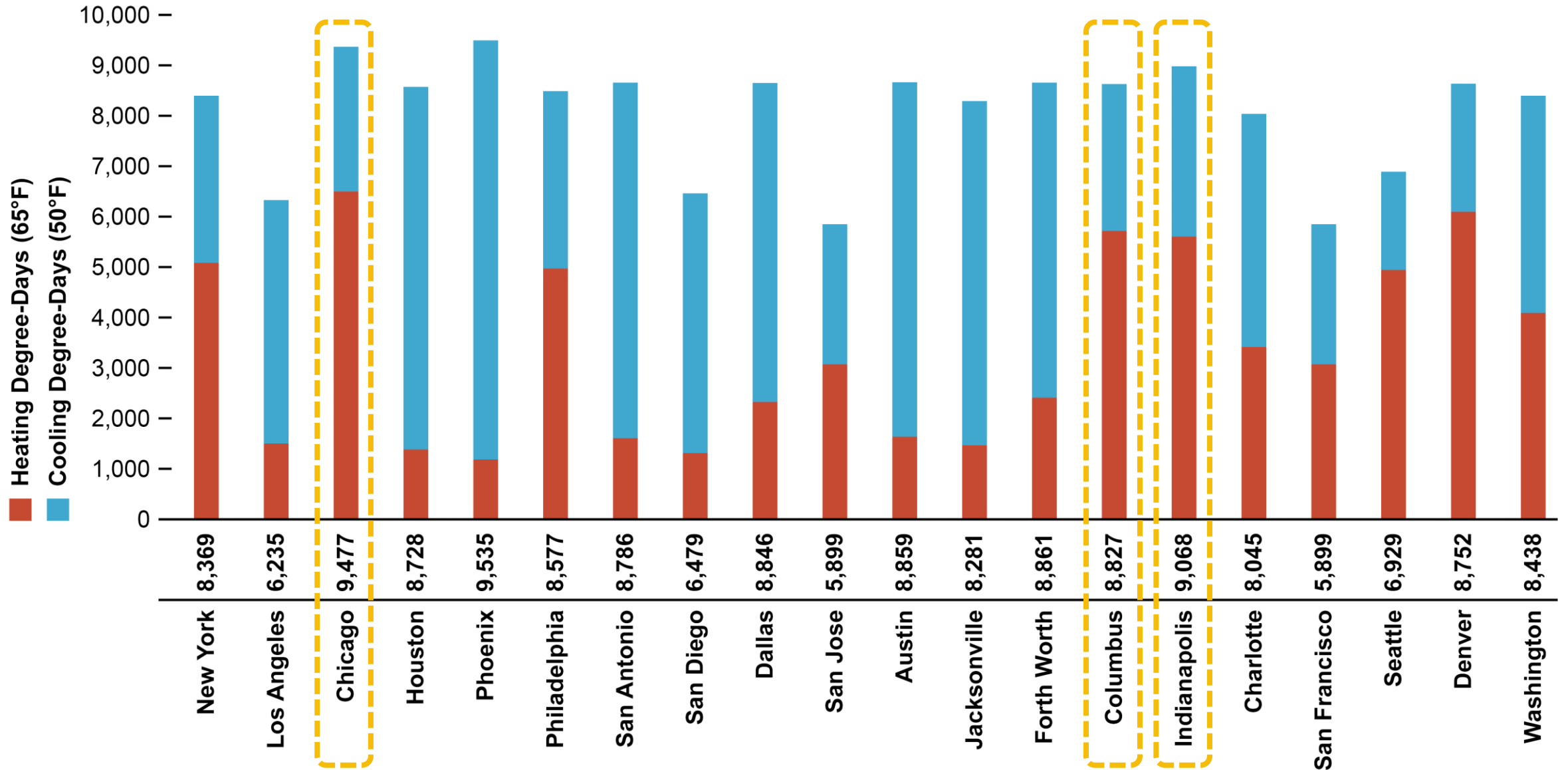
# Design Dry-Bulb Temperature Ranges for the 20 Largest Cities in the U.S.



Note: San Francisco data was utilized for San Jose because the latter was not exhibited in the referenced data source.

Source: Daniel Overbey

# HDD and CDD for the 20 Largest Cities in the U.S.



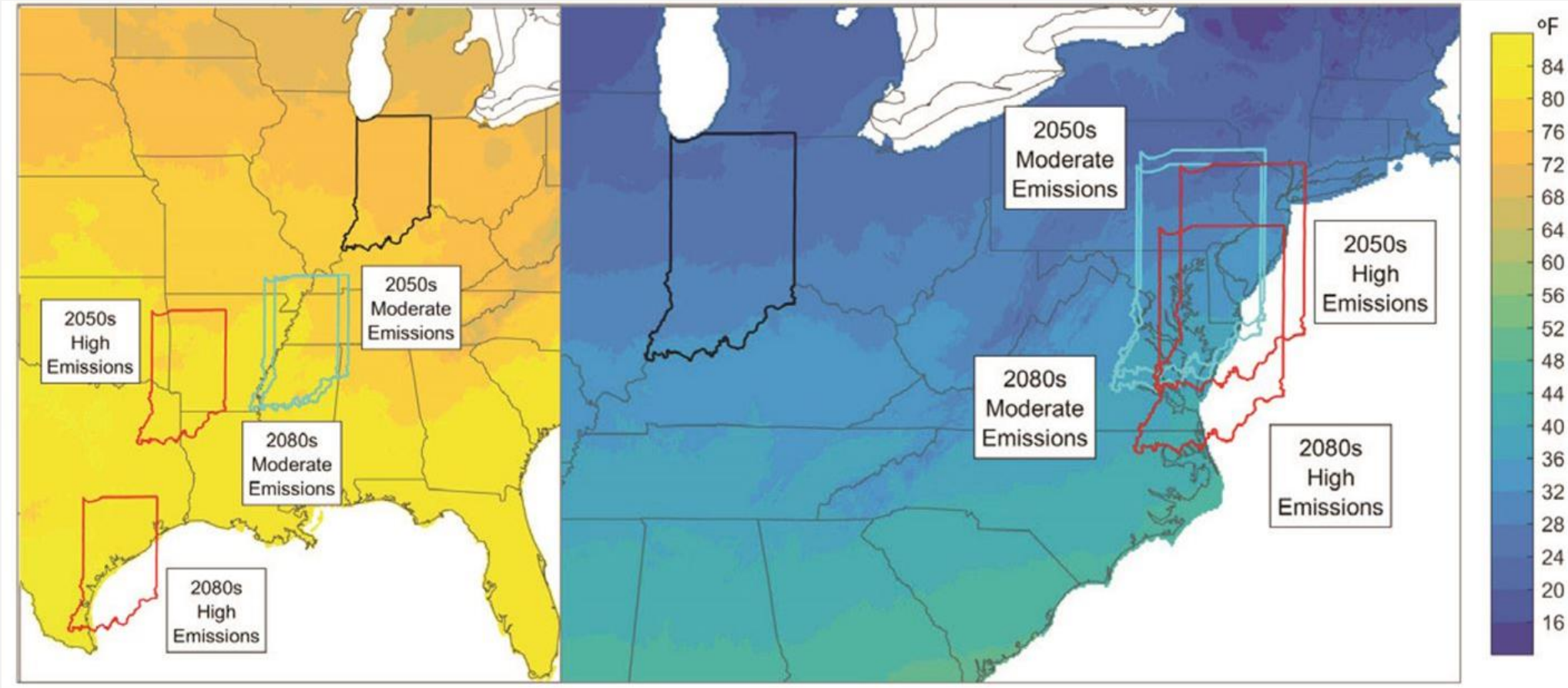
Note: San Francisco data was utilized for San Jose because the latter was not exhibited in the referenced data source.



# Global Warming – What it means for Indiana

Summer Analog

Winter Analog

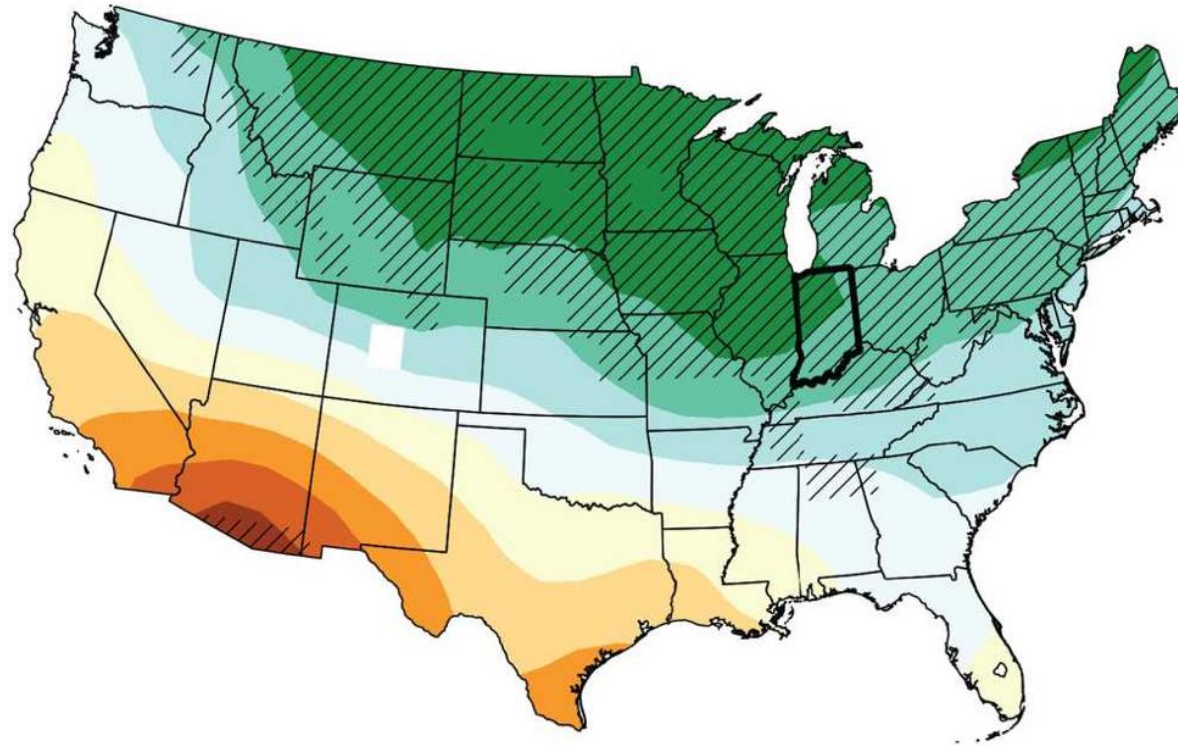


# Climate Design Factors

Design Factor:	Indianapolis	2050 Moderate	2080 Moderate	2050 High	2080 High
Winter Comparison	(Current)	Baltimore	Baltimore	Dover	Salisbury
Summer Comparison		Memphis	Memphis	Texarkana	Corpus Christi
Average Low in January (deg F)	20	27 (+7)	27 (+7)	26 (+6)	27 (+7)
Average High in July (deg F)	85	91 (+6)	81 (+6)	94 (+9)	95 (+10)
<b>Temperature Delta (deg F)</b>	<b>65</b>	<b>64 (-1)</b>	<b>64 (-1)</b>	<b>68 (+3)</b>	<b>68 (+3)</b>

# Global Warming – What it means for Indiana

Projected Change in Spring Precipitation

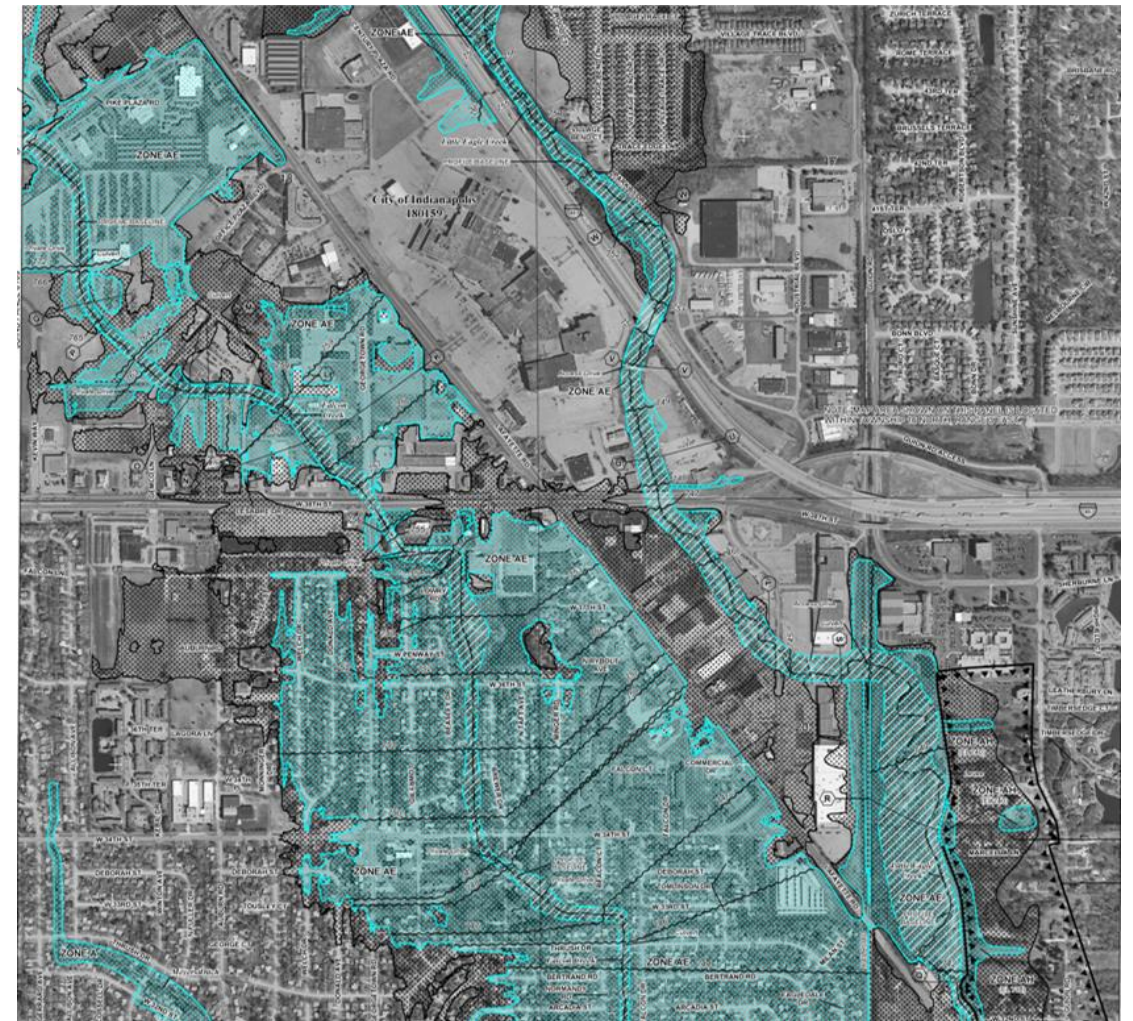
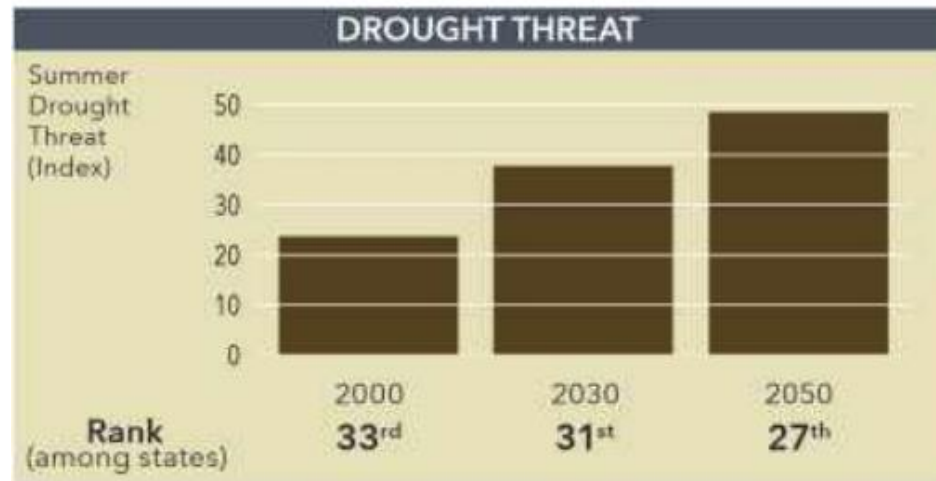
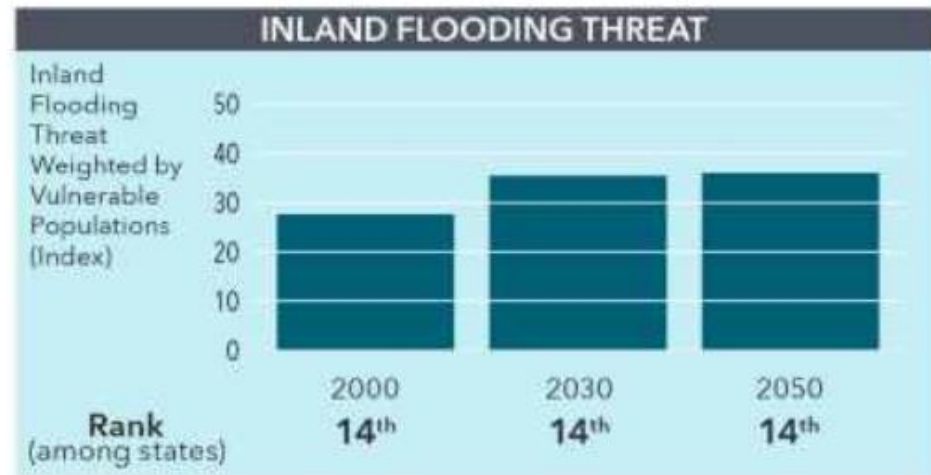


Change in Spring Precipitation (%)



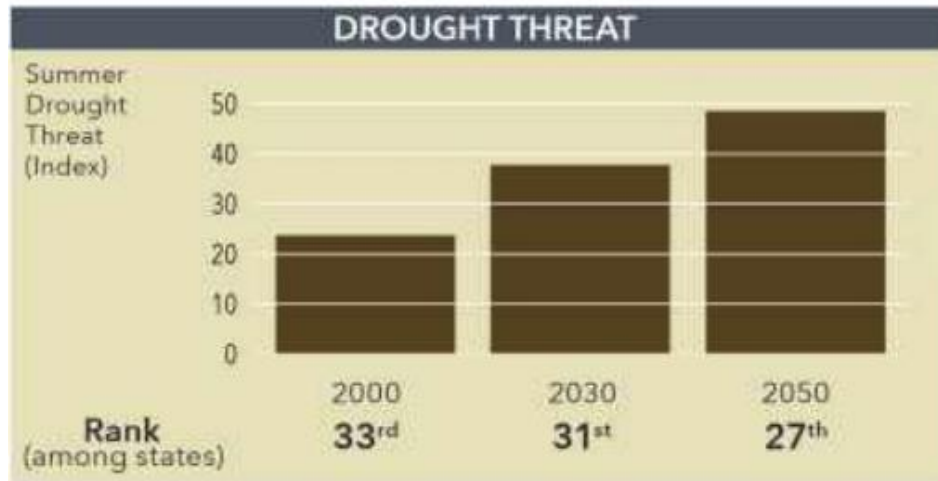
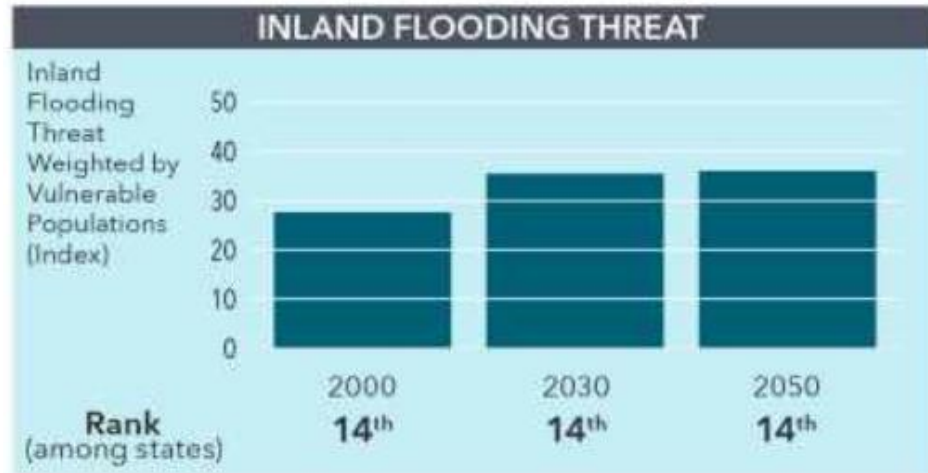
<math><-20</math> -15 -10 -5 0 5 10 >15

# Global Warming – What it means for Indiana



**REBUILD**

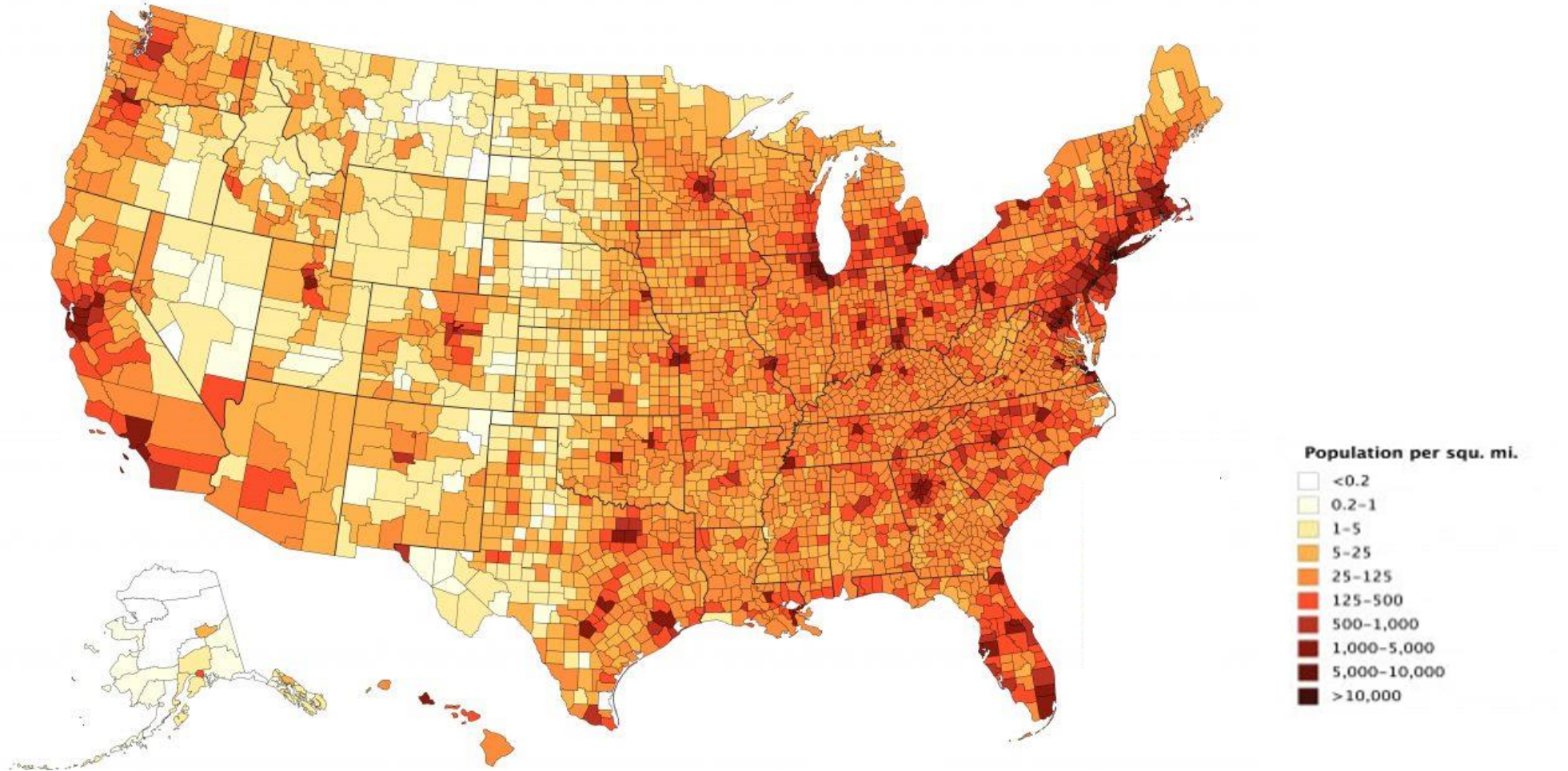
# Global Warming – What it means for Indiana



**It could be a lot worse....**



# Population Density



**We have a goal to limit warming by 2050...**



COP21 • CMP11  
**PARIS 2015**  
UN CLIMATE CHANGE CONFERENCE

**REBUILD**



**30 years is....**

## **AN INTERNATIONAL AGREEMENT**

**In 2015, world leaders agreed to take steps to limit global warming to 1.5°- 2.0° C (2.7°- 3.6° F) by 2050.**

**30 years is....**

**HOMEOWNERSHIP**

**Typical Mortgage Term is 30 Years**

**30 years is....**

**AN INVESTMENT**

**30 Year Treasury Bond**

**27.5 year useful life of a rental property per IRS**

**30 years is....**

**A GENERATION**

**Average age of first-time mothers in US is 26.9**

# Session Roadmap

**A** Prelude

**B** Act I: The State

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**D** Act III: The Practice

**E** Discussion



## **Act I: The State**



**Number of building-related codes currently enacted and in effect in Indiana.**

# Here are 9 of them...

## **2014 Indiana Building Code**

2012 International Building Code

## **2014 Indiana Fire Code**

2012 International Fire Code

## **2012 Indiana Plumbing Code**

2006 International Plumbing Code

## **2009 Indiana Electrical Code**

2008 NFPA 70

## **2014 Indiana Mechanical Code**

2012 International Mechanical Code

## **2014 Indiana Building Code Chapter 11**

A117.1, 2009 Edition

## **2010 Indiana Energy Conservation Code**

ASHRAE 90.1-2007

## **2014 Indiana Fuel Gas Code**

2012 International Fuel Gas Code

## **2020 Indiana Residential Code**

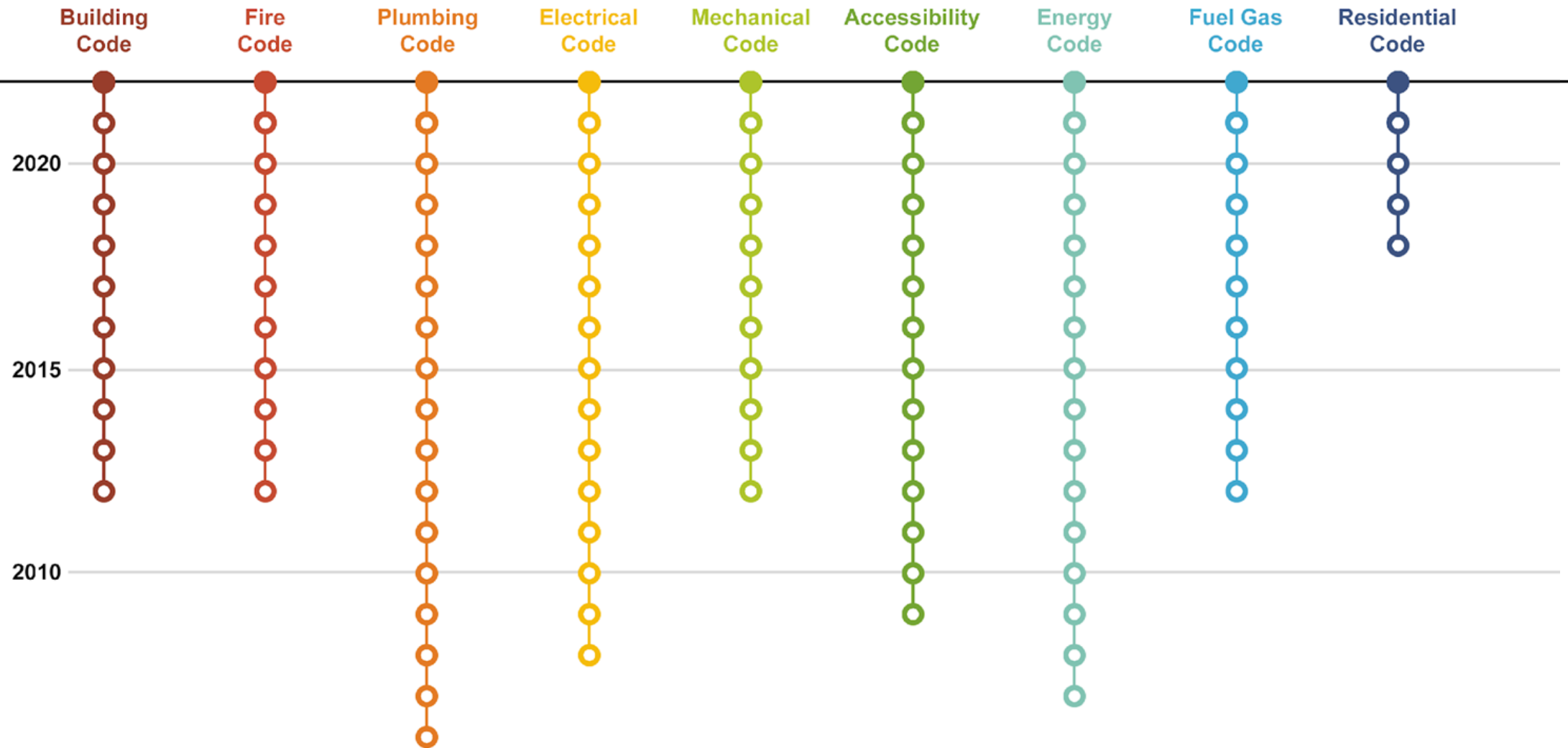
2018 International Residential Code

Information accurate as of January 20, 2022.

List is not exhaustive.



# Indiana's Aging Building Codes



# State Regulations

**Building regulations are a State issue.**

State and local governments are empowered to enact and regulate building codes as part of their reserved powers under the Tenth Amendment to the US Constitution.

Supreme Court has interpreted that amendment to permit the States to enact legislation designed to protect the health, safety, and welfare of their populace – the very rationale for the existence of codes.

In addition, the fiscal impact of implementing revised (or completely new) code language will vary widely from State-to-State.

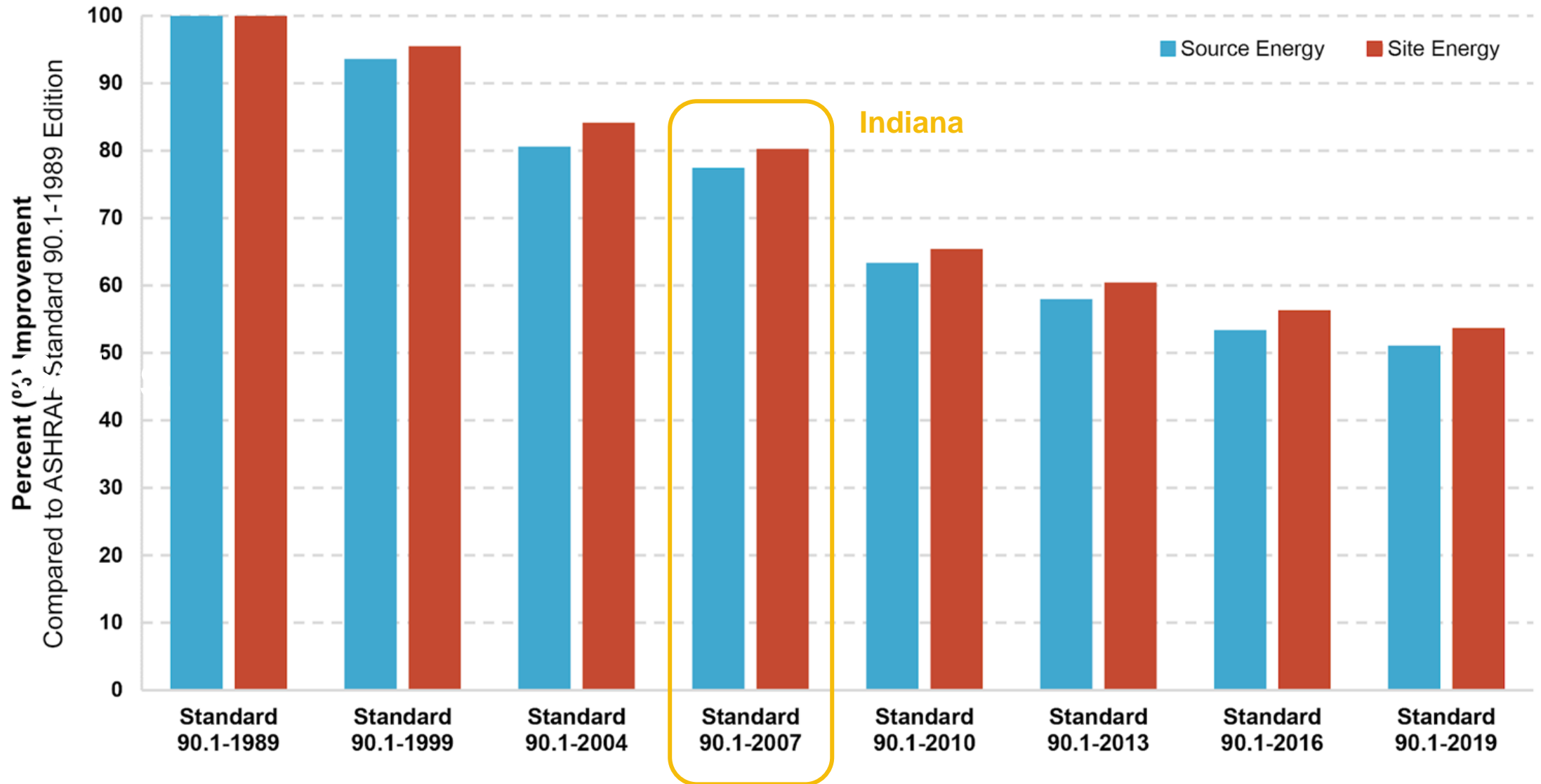
Thus, building regulation is a power appropriated to States - not the federal government.





# Percent Energy Efficiency Improvements of ASHRAE Standard 90.1

As determined by quantitative analyses contracted through the U.S. Department of Energy (DOE)



## Building codes

# 2010 Indiana Energy Conservation Code was set to expire on January 1, but...

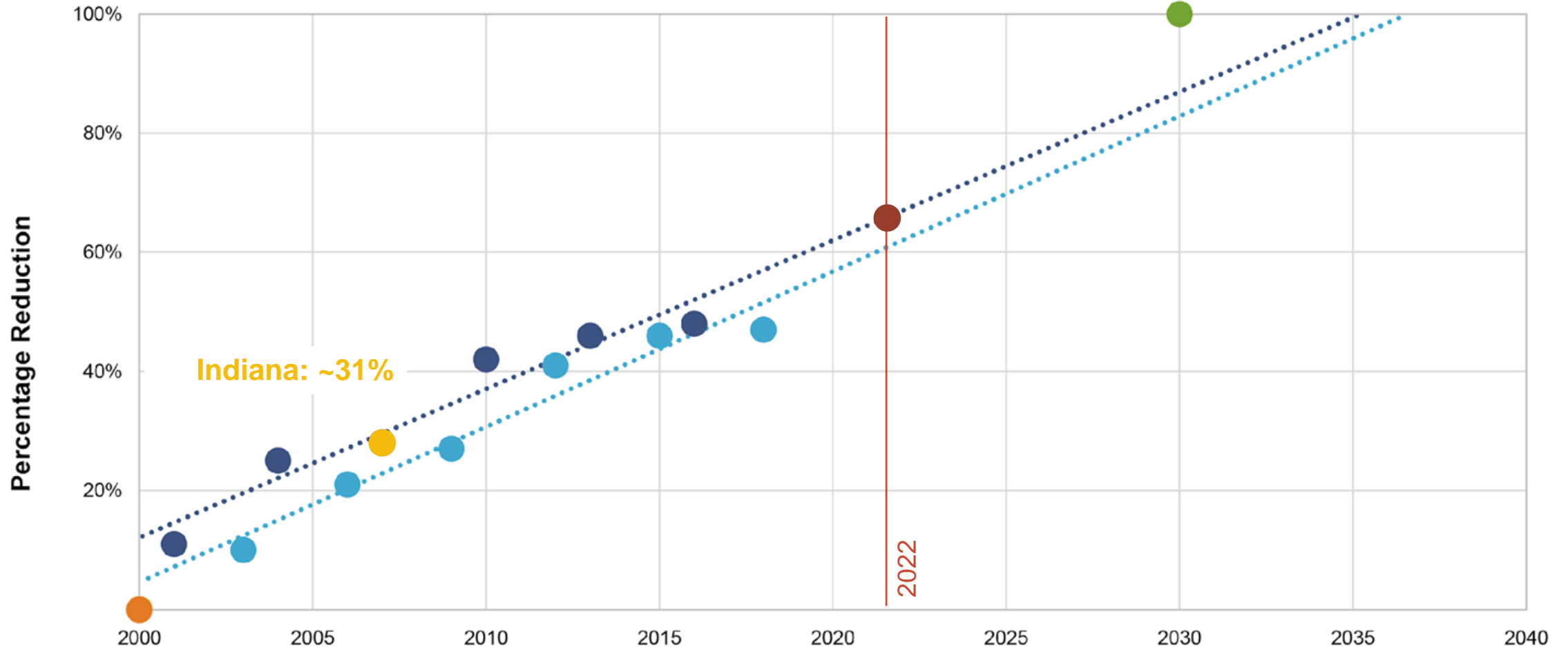
By Jason Shelley



Thanks to grassroots efforts led by AIA Indiana, the state's Energy Conservation Code was saved from extinction. It seemed like a holiday miracle for those of us working to get Gov. Mike Pence to extend the energy code. Without the energy code in place, it would have created havoc on new and renovated commercial and multi-residential buildings throughout the [state](#).

When AIA Indiana learned in early December that the Pence administration was considering letting the Energy Code expire, the component called an emergency meeting of its state Committee on the Environment to discuss the matter, generate talking points and develop a game plan. The component then reached out to the Indianapolis Business Journal and sent talking points to AIA members urging them to contact Gov. Pence and request he sign an executive order to extend the energy code another year. AIA Indiana also posted messages on social media to make the public aware of the consequences. Soon after, other interested groups also contacted the governor's office.

# Predicted EUI Reduction in Building Energy Codes (2000-2019)

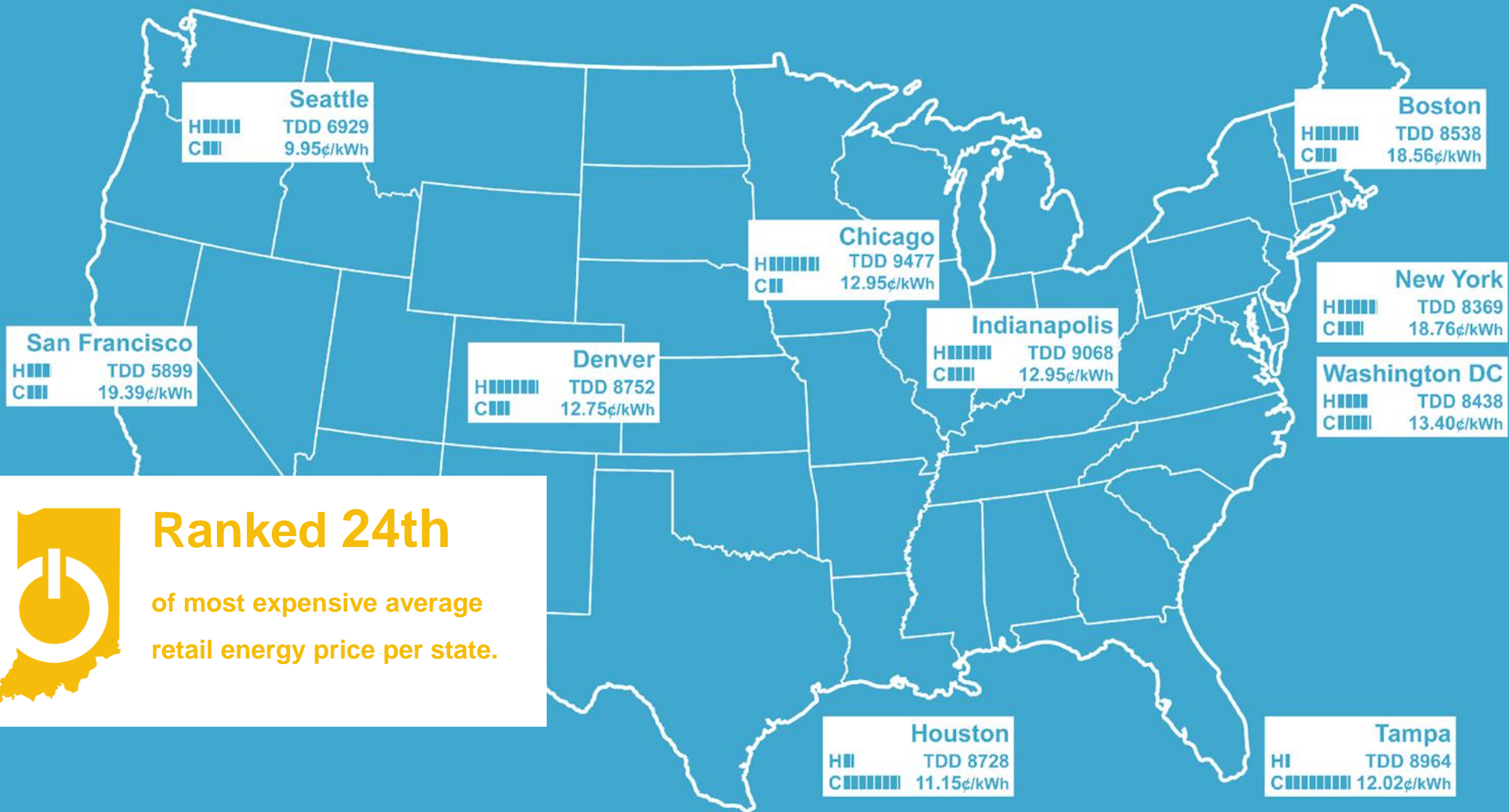


Sources:

Fuentes, G. et al. (2020). *2030 By The Numbers: The 2019 summary of the AIA 2030 Commitment*. American Institute of Architects.

Edelson, J. (2016). *Zero Energy Performance Index (zEPI)*. New Buildings Institute.

- CBECS-2003 (Status in Year-2000)
- ASHRAE 90.1
- IECC
- 2030 Commitment Target
- ⋯ Linear (ASHRAE 90.1)
- ⋯ Linear (IECC)



## Ranked 24th

of most expensive average retail energy price per state.





## Fun Facts

**Indiana now has a less stringent energy code than all of its adjacent neighbors.**

**Indiana is now in the upper half of states for most expensive energy costs.**

**The insurance industry is responding to Indiana's emerging risk/resilience concerns stemming from outdated codes.**



**What would be the fiscal impact of updating the 2010 Indiana Energy Conservation Code?**



# ASHRAE Standard 90.1 as the basis.

The 2010 Indiana Energy Conservation Code is based on 90.1-2007.



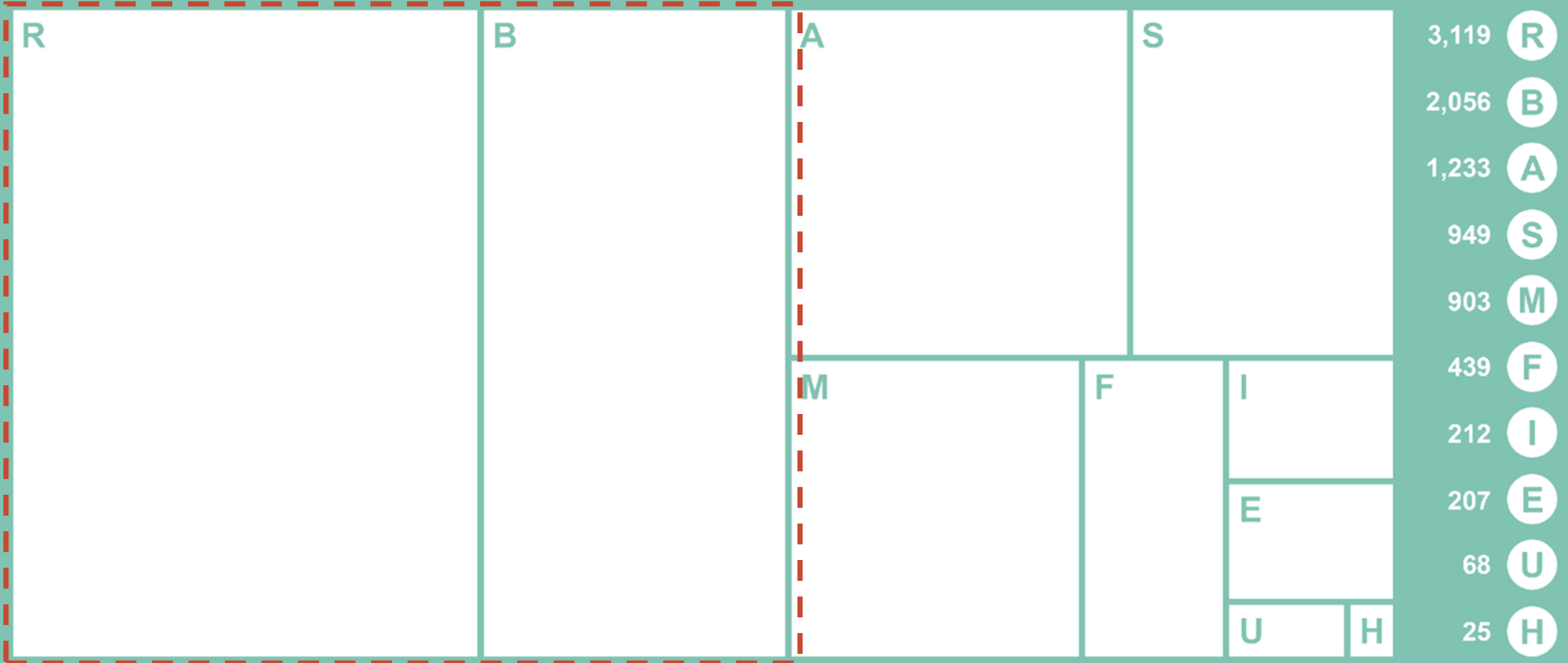
# 3

## Unique (and Built) Case Studies

# State Construction Design Release (CDR) Filings (by Occupancy Type).

For architectural filings in the last set of available annual data.

9,211 Filings



56% of total filings

# Examine three representative case studies.

All three projects are built in central Indiana.

## Business (large)



### Higher Education (BH)

107,655 sf

\$42,822,786 USD (2020)

Filed 2016

## Business (small)



### Commercial (Bc)

14,023 sf

\$5,876,563 USD (2020)

Filed 2017

## Residential (R-2)



### Multifamily (RM)

183,970 sf (188 units)

\$34,034,450 USD (2020)

Filed 2019

## Project goals.

Indiana Energy Conservation Code Fiscal Impact Assessment.

- 1 Assess built projects rather than theoretical models.
- 2 Evaluate the fiscal impact in accordance with Indiana statutes.
- 3 Differentiate the impacts of a 1-step versus 3-step update.
- 4 Clarify the degree to which the “market standard” may be beyond the code.
- 5 Gauge potential benefits to the state’s economy.

# Indiana Energy Conservation Code Fiscal Impact Assessment

Strategic Partners



**BALL STATE**  
**UNIVERSITY**





# Summary of Fiscal Impact Assessment



## Key Findings.

For every update to Indiana's energy code:

**0.39%**

**Average project  
cost increase.**

**5.9%**

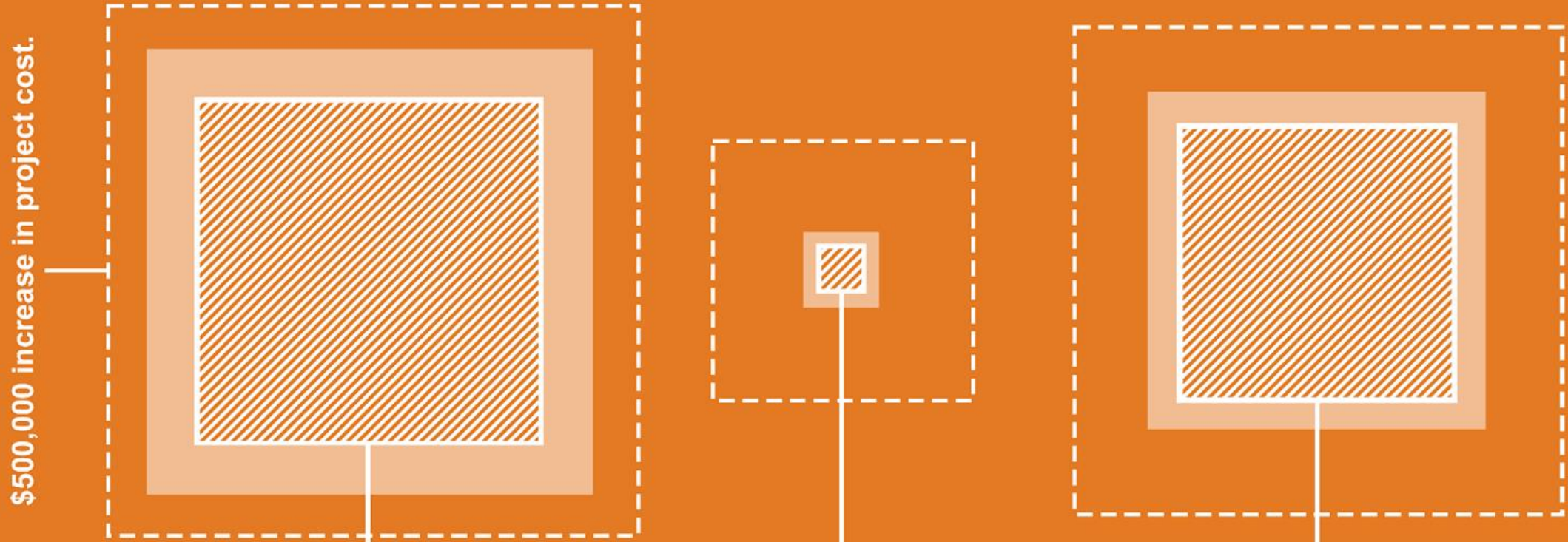
**Average energy  
cost savings.**

**\$64.2 Million**

**Annual state-wide  
energy cost  
savings.**

# Fiscal impact averaged \$133,304 per step.

In all three cases, the project cost increase was well under \$500,000.



B<sub>H</sub>

\$42.8 Million

B<sub>C</sub>

\$5.9 Million

R<sub>M</sub>

\$34.0 Million

Average project  
cost increase:

▲ \$261,213 / Step

▲ \$26,883 / Step

▲ \$111,815 / Step

# Fiscal impact averaged \$1.83 per square foot.

Project cost impact ranged by project type.

▲ \$1.83 / SF  
1-Step Average

▲ \$3.84 / SF  
3-Step Average

Baseline Unit Cost

1-Step Average

B<sub>H</sub> ▲ \$2.74 / SF

B<sub>C</sub> ▲ \$2.02 / SF

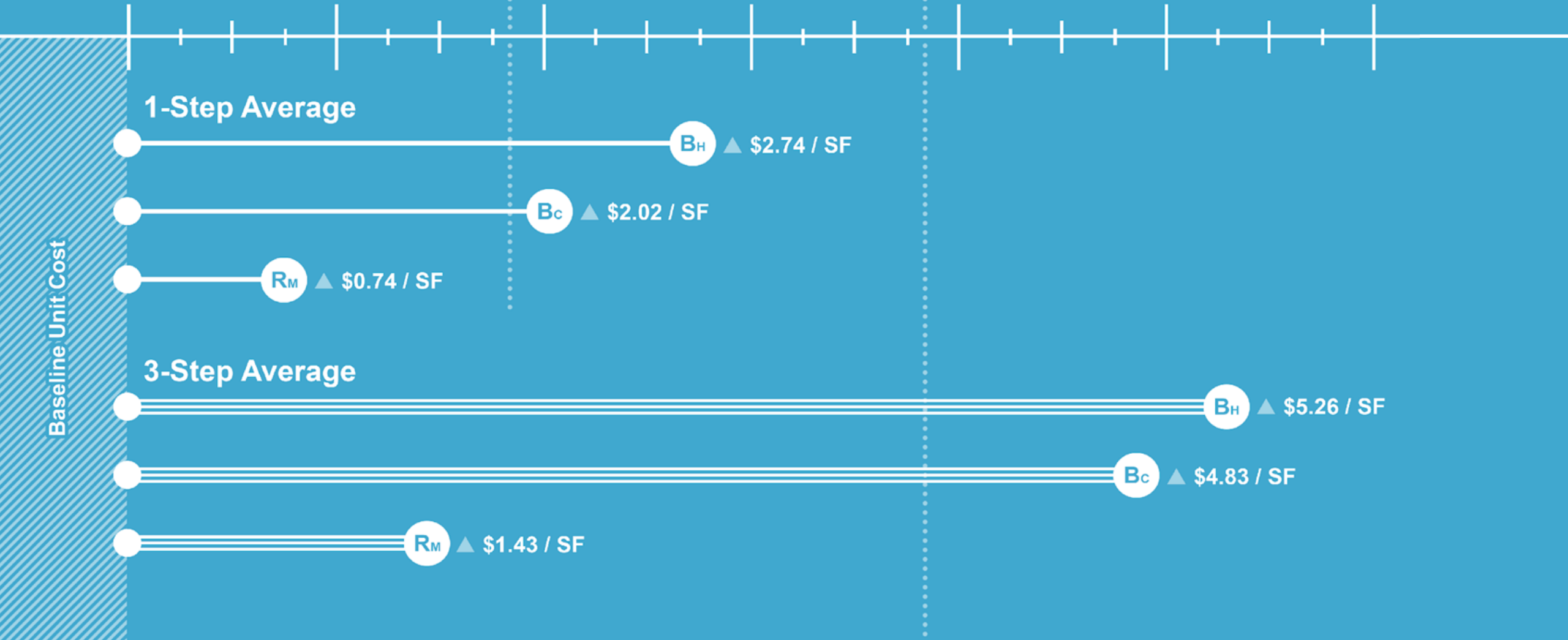
R<sub>M</sub> ▲ \$0.74 / SF

3-Step Average

B<sub>H</sub> ▲ \$5.26 / SF

B<sub>C</sub> ▲ \$4.83 / SF

R<sub>M</sub> ▲ \$1.43 / SF



► **Average cost impact was 0.39% per step (0.89% for three steps).**

Incremental steps come with minimal fiscal impact.

**0.39%** Average Project Cost Impact: 1-Step

**B<sub>H</sub>** ▲ 0.51%    **B<sub>C</sub>** ▲ 0.36%    **R<sub>M</sub>** ▲ 0.30%

**0.89%** Average Project Cost Impact: 3-Step

**B<sub>H</sub>** ▲ 1.09%    **B<sub>C</sub>** ▲ 0.89%    **R<sub>M</sub>** ▲ 0.68%

# Total energy consumption was reduced 5.9% per step.

Separate energy cost analysis examined the particulars of the three case studies.



**5.9%**

Average Total Energy Reduction / Step

Note: Cost information based on a energy prices as of December 17, 2020.

# A Decade of Cumulative Impact.

The 3-year step-up plan.

**\$1.4 Billion**

Energy cost savings (cumulative)

**18.4 Billion lbs CO<sub>2</sub>**

Equivalent GHG emissions saved (cumulative)

Year 1 2 3 4 5 6 7 8 9 10

Step 1

Step 2

Step 3

Step 4



**\$64.2 Million**

Energy cost savings per year (average per step)

**834.5 Million lbs CO<sub>2</sub>**

Equivalent GHG emissions saved per year (average per step)

*Note: Cost information based on a energy prices as of December 17, 2020.*

## ▶ The bottom line.

Why updating the energy code matters.

**A one-step increase has the best opportunity to meet fiscal impact** and be absorbed by the market.

**The market standard is advancing but it is not keeping up with the code advancements.**

**Incrementalism scales up.** Each update has a broad-ranging impact on state energy security and resilience.

**Puts stretch goals within reach.** Code updates close the gap on stretch goals and green building certification.





Indiana Statehouse  
Source: Wikipedia

# Session Roadmap

**A** Prelude

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## **Act II: The City**

# Where the Rubber meets the (pothole in) the Road



# City Responsibilities

## Implementation:

Infrastructure

Schools

Local services (EMS, fire, police)

Utilities (energy, water, sewer)

Ordinances

Development incentives

Attract companies in partnership with State

Density planning



**REBUILD**

Source: Trip Savvy

# Insurance Ratings

Determines fire insurance premiums for local property owners.

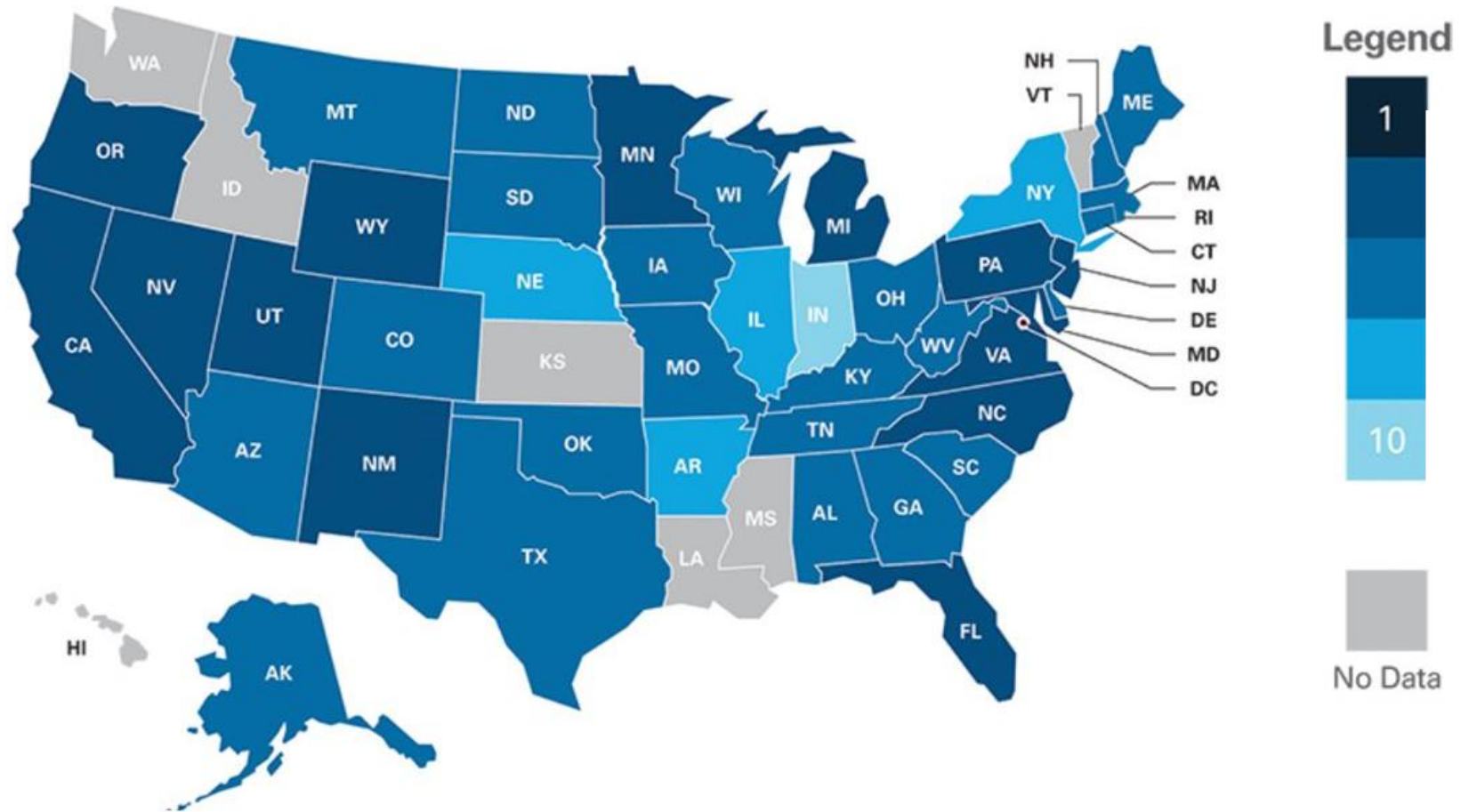
Upgrades to local fire departments can help.

BCEGS (Building Code Effectiveness Grading Schedule)

1 is good, 10 is bad.

Codes can help.

Commercial BCEGS Class Trends by State

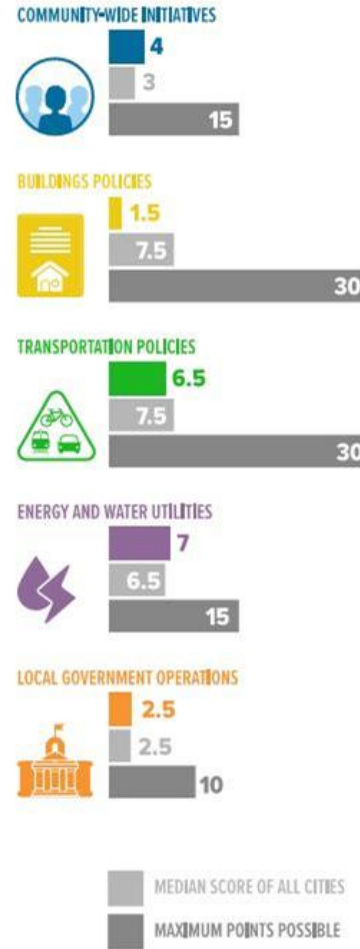


Source: Insurance Services Office, Inc.

# Clean Energy Scorecard

Indiana has outdated policies

Indiana is below average in almost every category

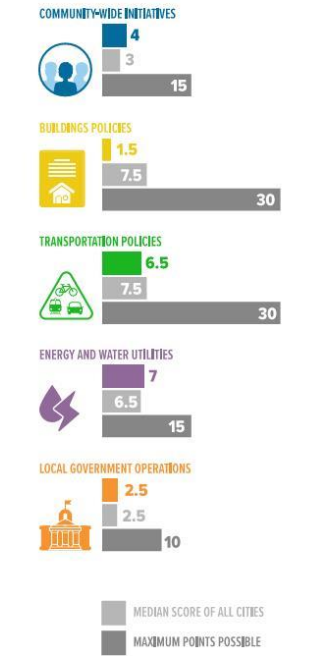


**RANK**  
**64/100** ↓

**OVERALL SCORE**  
**21.5/100**

**RECOMMENDATIONS**

- Establish and track metrics related to energy equity.
- Create or support energy efficiency workforce development programs and ensure these programs benefit historically marginalized communities.
- Adopt building tune-up and audit requirements for improving the energy performance of existing buildings.
- Expand high-quality transit access for low-income residents.
- Increase the deployment of EV charging infrastructure.
- Adopt and track a goal for reduction in VMT or transportation sector GHG emissions.

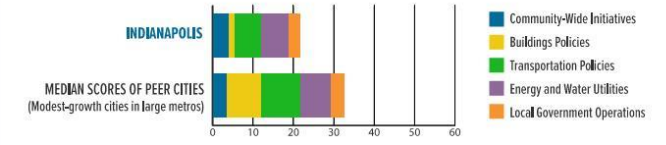


## 2021 CITY CLEAN ENERGY SCORECARD

# INDIANAPOLIS, IN

Indianapolis performed best in the energy and water utilities category and moved down in the rankings from the previous Scorecard. The city has significant room for improvement in all policy areas and can take many actions to advance a clean energy future.

### HOW DOES INDIANAPOLIS STACK UP TO PEER CITIES?



### COMMUNITY-WIDE INITIATIVES (4 OF 15 POINTS)

Indianapolis's GHG emissions reduction and renewable energy goals set the vision for a clean energy future; however, ACEEE was unable to project if the city will achieve its community-wide GHG emissions reduction goal of carbon neutrality by 2050 because insufficient GHG emissions data were available for our analysis. The city supported the integration of energy storage in the Citizens Energy district energy system. To mitigate the urban heat island effect, it aims to plant 30,000 trees by 2025.

### BUILDINGS POLICIES (1.5 OF 30 POINTS)

Indiana requires all jurisdictions to enforce the Indiana Energy Conservation Code, which references the 2009 International Energy Conservation Code for residential buildings and ASHRAE 90.1-2007 for commercial buildings. The codes are not stringent when compared to building energy codes in effect in other cities, and Indianapolis does not yet advocate for more stringent building energy codes. The city allows solar in all zones and offers two neighborhood grant programs as part of its Better Buildings Program.

### TRANSPORTATION POLICIES (6.5 OF 30 POINTS)

Of low-income households in Indianapolis, 0% have access to high-quality transit. With only 10.6 per 100,000 people, the city has a very low number of EV charging station ports available for public use. Indianapolis has neither a sustainable freight transportation plan in place nor any policies that address freight efficiency, nor has it codified VMT or transportation-related GHG reduction targets. Transportation entities that serve the city have received roughly \$36.88 per capita on average in local transit funding annually between 2015 and 2019, a very low funding level.

### ENERGY AND WATER UTILITIES (7 OF 15 POINTS)

Compared to other utilities, AES Indiana shows moderate savings as a percentage of sales for electric efficiency programs. Citizens Energy Group does not run any natural gas programs. While AES Indiana offers a comprehensive low-income program with deep savings measures, it does not offer a portfolio of multiple low-income programs or a comprehensive energy efficiency program for multifamily buildings. The city receives community-wide energy use data every three years for GHG inventory purposes and publishes this data in the Thrive Indianapolis plan. The city also participates in AES Indiana's Integrated Resource Plan development and partners with utilities through Thrive Indianapolis to promote renewable energy. AES Corporation, the parent company of AES Indiana, set a stringent goal to reduce its carbon intensity 70% by 2030 from a 2016 baseline.

### LOCAL GOVERNMENT OPERATIONS (2.5 OF 10 POINTS)

Indianapolis has a GHG emissions reduction and renewable energy goal for local government operations; however, ACEEE was unable to project if the city will achieve its goal of local government operations carbon neutrality by 2050. Indianapolis requires the purchase of electric or hybrid vehicles and has converted almost all streetlights to LEDs. The city has not installed renewable energy systems on municipal facilities or developed a comprehensive retrofit strategy. We were unable to verify that Indianapolis has inclusive procurement policies used for energy projects.



# Know the local issues – Water Quality

Combined Sewers

Industrial Waste Upstream

Stormwater overflow



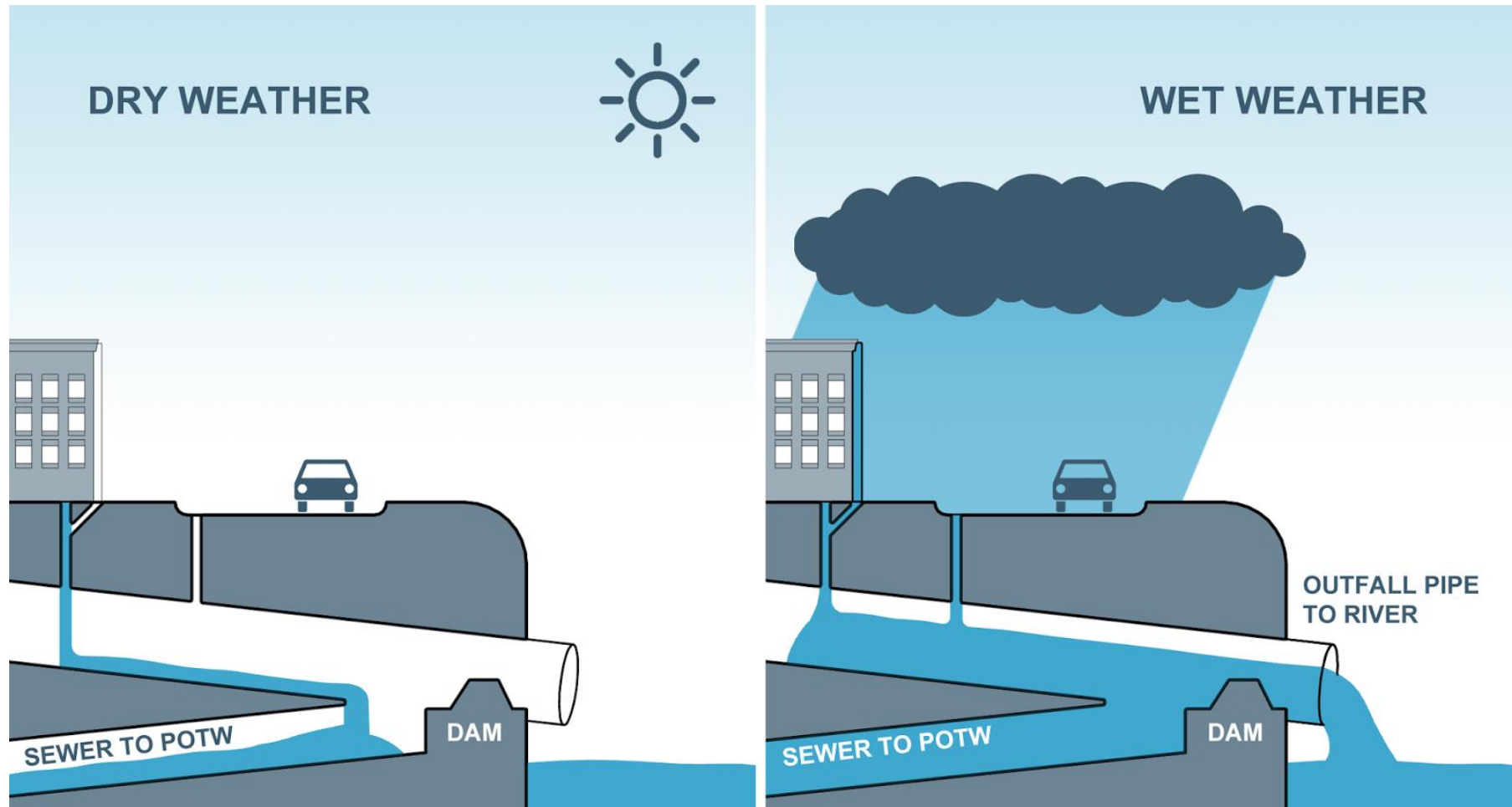


# White River



**RE**BUILD

# Overtaxed CSO Infrastructure



**REBUILD**

# DigIndy Project

Overflows go into underground tunnel systems to protect the White River.

Makes the White River safe to touch, not to swim or fish.

Still expecting increased rainfall in the future.



**REBUILD**

Source: DigIndy

# Local Government Drivers



**THRIVE INDIANAPOLIS**

**REBUILD**

# PLANNING FOR A THRIVING CITY

**ECONOMY**  
PAGE 44



**TRANSPORTATION  
+ LAND USE**  
PAGE 69

**ENERGY**  
PAGE 49



**PUBLIC HEALTH  
+ SAFETY**  
PAGE 64

**NATURAL  
RESOURCES**  
PAGE 59



**BUILT  
ENVIRONMENT**  
PAGE 39

**FOOD +  
URBAN AGRICULTURE**  
PAGE 54



**WASTE +  
RECYCLING**  
PAGE 74








**Know your impact.**

# BUILT ENVIRONMENT OBJECTIVE 1

All new buildings meet basic green building standards,\* and programs to increase energy and water efficiency are actively pursued in existing buildings.

\*i.e., basic requirements of green building programs that focus on minimum energy and water standards

## IMPLEMENTATION BENEFITS:

ACTION	POTENTIAL FUNDING SOURCE(S)	INITIAL COSTS TO IMPLEMENTERS	ONGOING COSTS TO IMPLEMENTERS	Equity Benefits: Reducing Disparities	Positive Public Health Impacts	Potential for Net Job Creation	GHG Reduction Potential	Increased Resilience for Socially Vulnerable Areas/ Populations
<p><b>BE:1A</b>                      Develop an energy benchmarking and disclosure policy for municipal and commercial buildings with the first-year disclosure completed by the end of 2020.</p>	<p>American Cities Climate Challenge grant</p>	<p>\$</p>	<p>\$</p>					



# Advocacy - Letters of Support



October 05, 2020

Honorable Members of the Indianapolis City-County Council  
200 E. Washington St. #241  
Indianapolis, IN 46204

**Re: Benchmarking and Transparency Ordinance**

Dear Councilors:

The American Institute of Architects Indiana Chapter (AIA Indiana), which represents over 500 Architects in the Indianapolis Metro Area, is writing in strong support of the proposed Benchmarking and Transparency Ordinance. This ordinance will effectively create the equivalent of a Miles Per Gallon rating for our buildings by measuring their annual energy and water use and recording it in a publicly accessible database.

Indianapolis sources 88% of its energy from the burning of fossil fuels, and as the city seeks to simultaneously generate economic growth and transition towards clean energy sources, managing the energy use of our commercial buildings will be key because we cannot manage what we don't measure. The Benchmarking and Transparency will facilitate these goals by enhancing consumer awareness of building performance metrics, which will create a market-based incentive for building owners to pursue energy efficiency. This market-based influence will:

1. Lead to economic development and job creation related to energy-efficient improvements.
2. Reduce the energy consumption and greenhouse gas emissions from buildings.
3. Reduce energy costs for businesses and building owners.
4. Provide energy information to building owners and tenants, driving a marketplace focus on continuous improvement.
5. Provide City leaders with key information on utility usage that will inform plans to upgrade and expand our City's utility infrastructure.

Indianapolis has made a crucial commitment to the health of its citizens and our planet by adopting the Thrive Indianapolis Plan, which lists the adoption of a benchmarking ordinance as one of its goals. By adopting this ordinance, Indianapolis will join several of our neighbors in the Midwest that have adopted similar policies including Columbus, Chicago, St. Louis, Des Moines, and Pittsburgh.

This ordinance is aligned with AIA's core values at the national level, including our goal to achieve carbon neutrality in the built environment by 2030; and our members have the skills and knowledge to help building owners make informed decisions as it relates to energy efficient improvements, as well as assist and train building owners in the reporting of energy use data. We are proud to support the Benchmarking and Transparency Ordinance as it is considered by the Council in 2020, and look forward to partnering with the City in 2021 and beyond as it is implemented.

Kindest Regards,

Joseph T. Yount, AIA, LEED AP BD+C, WELL AP

AIA Indiana, Jason Shelley, Executive Director  
115 W. Washington St., Suite 955, Indianapolis, IN 46204  
Phone (317) 634-6993  
[www.aiaindiana.org](http://www.aiaindiana.org) • [jshelley@aiaindiana.org](mailto:jshelley@aiaindiana.org)



October 27, 2020

Honorable Members of the Indianapolis City-County Council  
200 E. Washington St. #241  
Indianapolis, IN 46204

**Re: Benchmarking and Transparency Ordinance**

Dear Councilors:

The ASHRAE Central Indiana Chapter which represents over 300 Engineers in the Indianapolis Metro Area, is writing in strong support of the proposed Benchmarking and Transparency Ordinance. This ordinance will effectively create the equivalent of a Miles Per Gallon rating for our buildings by measuring their annual energy and water use and recording it in a publicly accessible database.

Indianapolis sources 88% of its energy from the burning of fossil fuels, and as the city seeks to simultaneously generate economic growth and transition towards clean energy sources, managing the energy use of our commercial buildings will be key because we cannot manage what we do not measure. The Benchmarking and Transparency will facilitate these goals by enhancing consumer awareness of building performance metrics, which will create a market-based incentive for building owners to pursue energy efficiency. This market-based influence will:

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This ordinance is aligned with ASHRAE core values at the national level, including our goal to achieve carbon neutrality in the built environment by 2030, and our members have the skills and knowledge to help building owners make informed decisions as it relates to energy efficient improvements, as well as assist and train building owners in the reporting of energy use data. We are proud to support the Benchmarking and Transparency Ordinance as it is considered by the Council in 2020, and look forward to partnering with the City in 2021 and beyond as it is implemented.

  
Doug Fick  
Assistant Regional Chair Region V

  
Alex Rovder  
Central Indiana Chapter President

Cc: Joseph Yount – AIA Indianapolis  
Tony Schoelein – Government Affairs Chair  
Douglas Zentz – Director and Regional Chair Region V

October 22, 2020

Honorable Members of the Indianapolis City-County Council  
200 E. Washington St. #241  
Indianapolis, IN 46204

**Re: Benchmarking and Transparency Ordinance**

Dear Councilors:

ERMCO, Inc. is a local union electrical contractor here in Indianapolis since 1962 and currently represents 600+ craftspeople in the field and 125 office staff. ERMCO is writing to you in support of the proposed Benchmarking and Transparency Ordinance. This ordinance would provide a phased starting point and could be leveraged to achieve economic growth through construction to improve building energy efficiency.

According to the Thrive Indianapolis planning project, in 2016, 65.9% of GHG Emissions in the Indy Metro area were from buildings. Focusing on this sector would provide the largest return on investment for Indianapolis from a reduction in energy consumption and greenhouse gas emissions. Benchmarking the buildings would rank buildings and compare them to identify which ones use the most energy per size. This information could be used to prioritize and plan improvements. Those improvement projects would provide:

- An economic impact to Indianapolis and the construction trades
- Lower energy consumption and GHG emissions by the built environment
- Provide trackable results from the implemented projects
- Bring Indianapolis into the forefront with 34 other major cities, 9 in the Midwest, that currently have some version of benchmarking requirements (according to Institute for Market Transformation)
- Make Indianapolis a more attractive place for people and businesses as a result this commitment to energy efficiency and a sustainable future

ERMCO, Inc. has made a commitment to energy efficiency with an energy solutions team and previous work in solar, energy efficiency, and building integration. It is our belief that this Ordinance is in line with our commitment to serve the Indianapolis Metro Area to provide a sustainable future. We would like to show our strong support for the Benchmarking and Transparency Ordinance. We look forward to our continued relationship with the City and make a commitment to work with the City in the implementation of this Ordinance once passed and beyond.

Sincerely,  
ERMCO, Inc.

  
David Peterson  
Senior Vice President

1625 W THOMPSON RD - INDIANAPOLIS, IN 46217 - 4655 MIDDLE ROAD, SUITE B - COLUMBUS, IN 47203  
(317)780-2923 - WWW.ERMCO.COM - (812)372-1569

REBUILD



# Benchmarking & Transparency Ordinance

July 12, 2021:

**Passed by Indianapolis City-County Council**

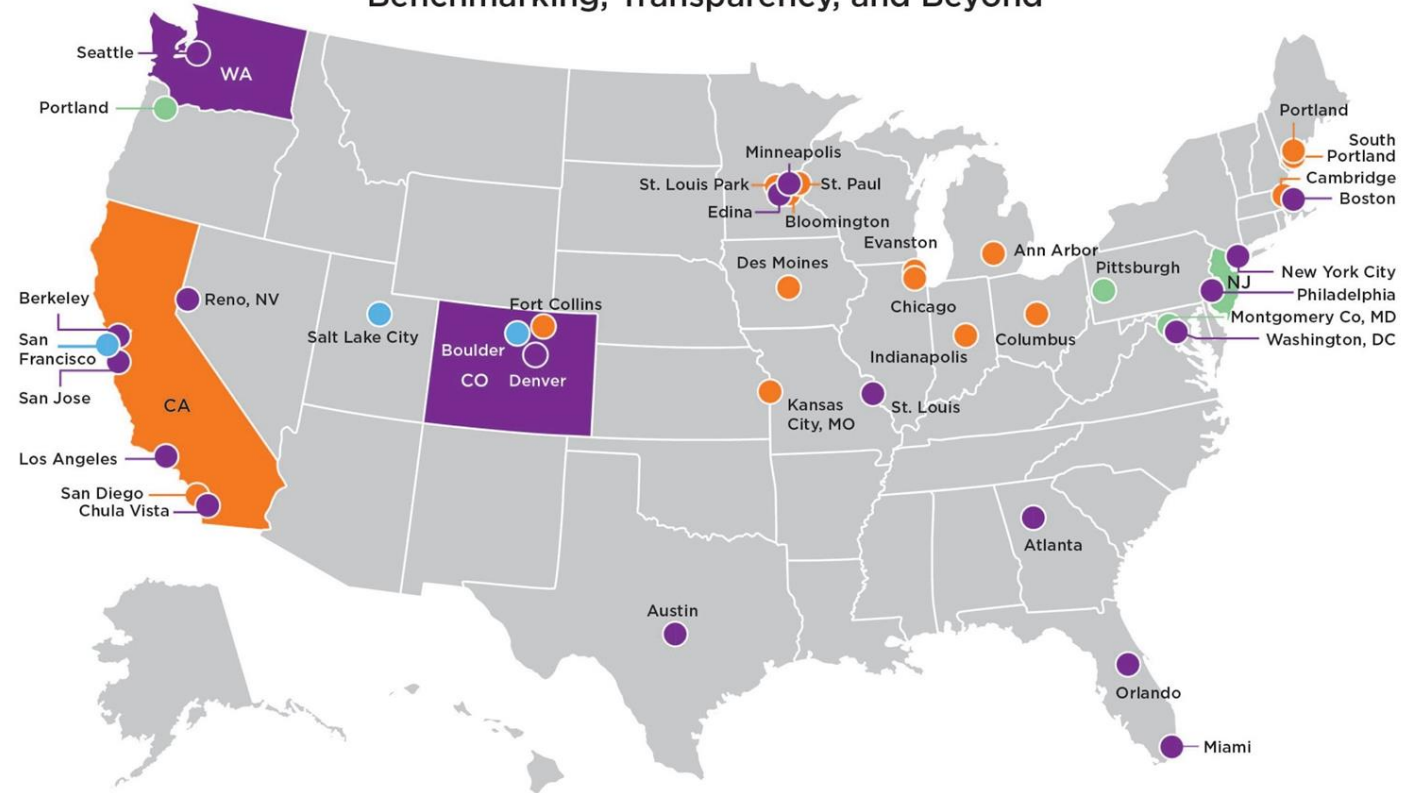
Energy benchmarking ordinance.

First major building sector objective of the Thrive Indianapolis plan.

Requires commercial buildings over 50,000SF to report annual energy use in publicly accessible database.

Like an MPG rating for buildings.

U.S. City, County, and State Policies for Existing Buildings: Benchmarking, Transparency, and Beyond



© Copyright 2021 Institute for Market Transformation. Updated 11/2021

- Benchmarking required for public and commercial buildings
- Benchmarking required for public, commercial, and multifamily buildings
- Benchmarking and additional actions required for public and commercial buildings
- Benchmarking and additional actions required for public, commercial, and multifamily buildings

REBUILD

Source: IMT

**BE:1B**

Require all new commercial construction to meet electric vehicle (EV) readiness requirements for 20% of parking spaces by 2020, with the goal of significantly increasing charging infrastructure at businesses and workplaces.

Private corporations

\$

\$



# NEC Load Calculations for 300,000 SF Office Building



**1,260A Lighting Load  
(2017 NEC)**



**470A Lighting Load  
(2020 NEC)**

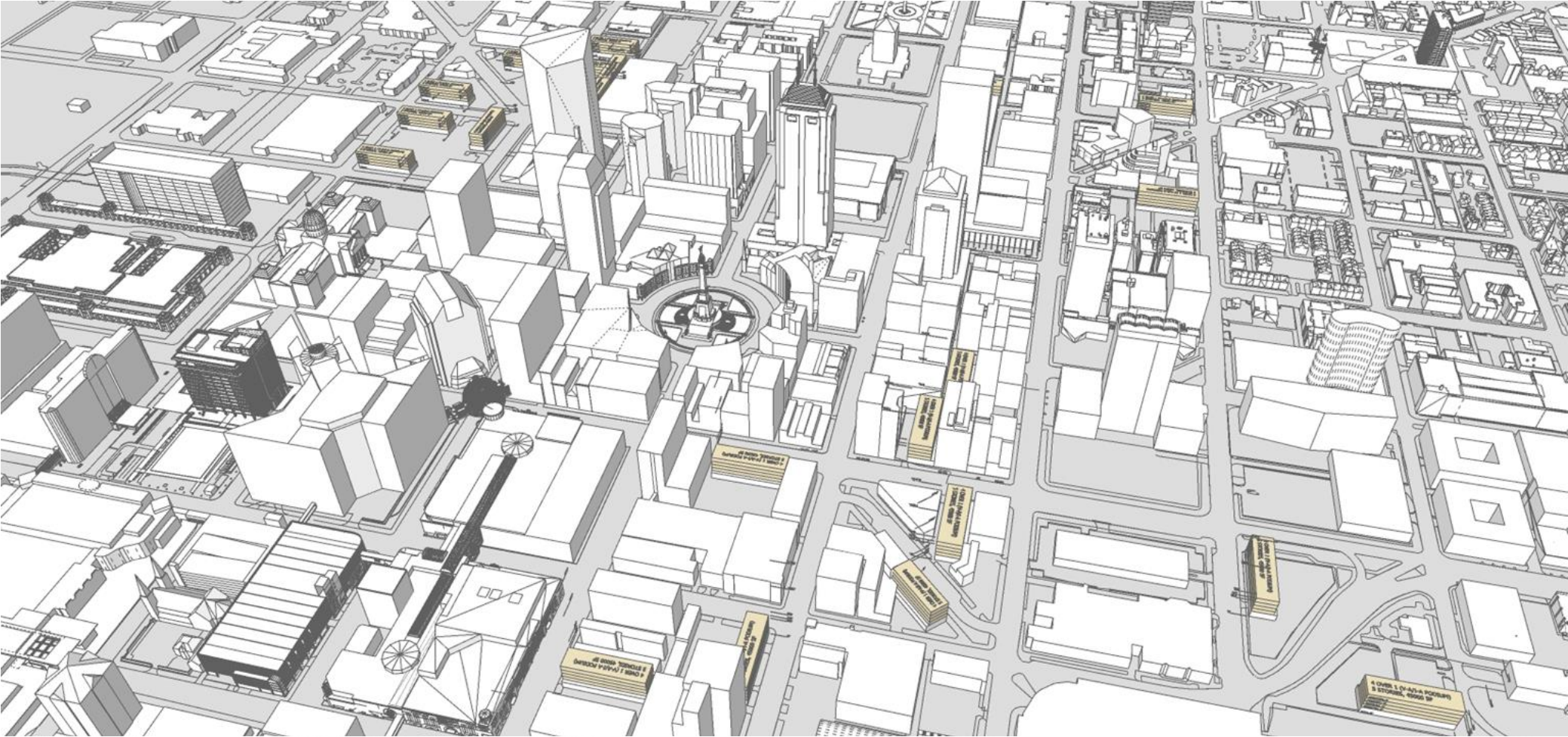
# Networking

**AIA** Indiana  
PRESENTS  
**SUSTAINABILITY  
HAPPY HOUR**  
SEPTEMBER 15, 2021  
4:30 - 6:30 PM  
CENTERPOINT BREWING  
1125 BROOKSIDE AVE. INDIANAPOLIS 46202

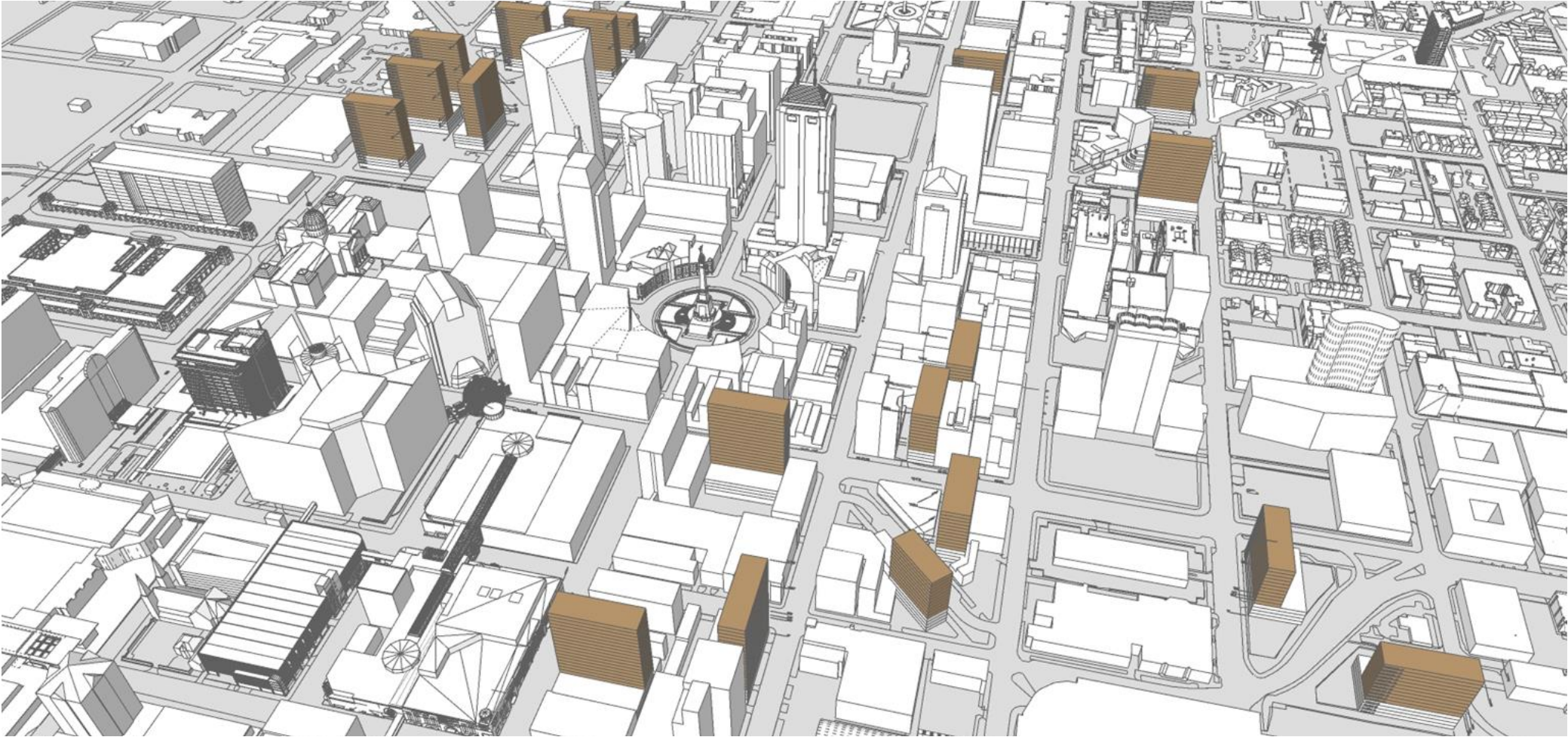


**REBUILD**

# 2021 IBC – Mass Timber



# 2021 IBC – Mass Timber



# 2021 IBC – Mass Timber



# 2021 IBC – Mass Timber





# Welcome to Indiana!



# Welcome to Indiana!



# Welcome to Indiana!



# Welcome to Indiana!



# Welcome to Indiana!





Indianapolis Monument Circle  
Source: Monumental Marathon

# Session Roadmap

**A** Prelude

**B** Act I: The State

**C** Act II: The City

**D** Act III: The Practice

**E** Discussion



## **Act III: The Practice**



# How to sell sustainability in the Midwest:

## DIFFICULT TO ADDRESS

Rising Temperatures

Economy

Regulation

## OPPORTUNITIES THROUGH DESIGN

Sustainable Design Approach

Energy Efficiency Standards

Best Practices

**RE**BUILD

# 2030 Challenge Signatories

220

The number of  
AIA firms in  
Indiana in 2022

14

The number of  
2030  
Signatories in  
Indiana in 2022

6

The number of  
2030  
Signatories  
reporting in  
Indiana in 2022

ADOPTER



REBUILD

## Limited Resource Capitals

Resources are limited. The role of codes, standards, and rating systems hold project teams accountable to minimum standards.

We build at:

...minimal cost.

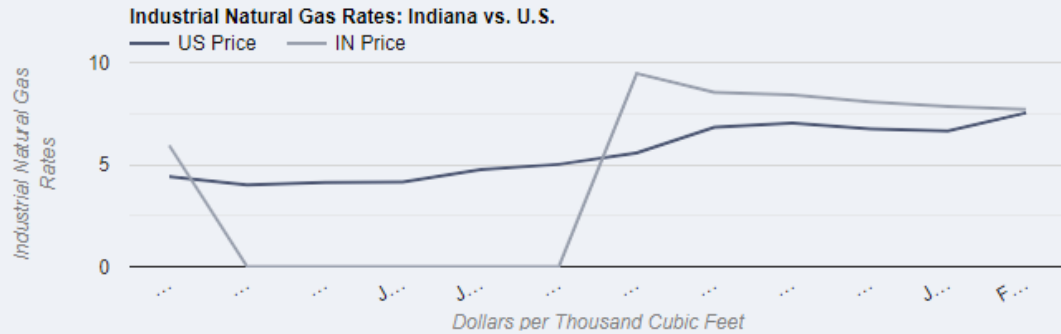
...minimal time.

...minimal performance.

# Rising Fossil Fuel Costs

## Industrial Natural Gas Rates in Indiana

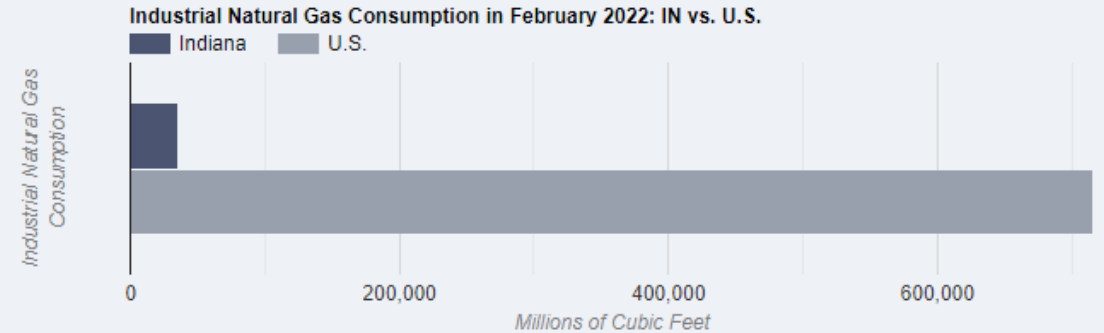
In February 2022, **industrial natural gas prices in Indiana** averaged \$7.71 per thousand cubic feet, or about 2.4% more than the average rate of \$7.53 per thousand cubic feet in the U.S. overall in the most recent month with data. <sup>[1]</sup>



\*Prices listed as 0 (zero) are not available (N/A).

## Industrial Natural Gas Consumption in Indiana

In February 2022, **industrial natural gas usage in IN** totaled 36,130 million cubic feet, which was about 5% of the industrial natural gas used in the U.S. in its entirety (715,767 million cubic feet) that month. <sup>[1]</sup>



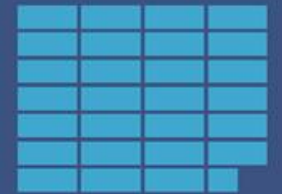
\*Amounts listed as 0 (zero) are not available (N/A).

# LEED Certified Gross Square Feet per Capita

Rank	State		Rank	State		Rank	State	
1	Nevada	3.40	19	Arizona	0.91	37	Maine	0.44
2	Massachusetts	2.55	20	Utah	0.86	38	Mississippi	0.41
3	Illinois	2.45	21	New Mexico	0.80	39	Kansas	0.39
4	Maryland	2.33	22	Tennessee	0.73	40	Wyoming	0.35
5	Virginia	2.08	23	Florida	0.67	41	Arkansas	0.34
6	California	2.02	23	Iowa	0.67	42	Delaware	0.32
7	New York	2.01	25	Missouri	0.60	43	West Virginia	0.31
8	Colorado	1.99	26	Connecticut	0.59	44	Montana	0.30
9	Washington	1.86	26	Rhode Island	0.59	45	Nebraska	0.29
10	Hawaii	1.59	26	Wisconsin	0.59	46	Idaho	0.26
11	Texas	1.42	29	Indiana	0.54	47	Alabama	0.25
12	Oregon	1.36	29	South Dakota	0.54	47	Oklahoma	0.25
13	Georgia	1.25	31	New Hampshire	0.53	49	North Dakota	0.24
14	Ohio	1.08	31	South Carolina	0.53	50	Louisiana	0.22
15	Minnesota	1.05	33	Alaska	0.51			
16	Pennsylvania	1.02	34	Vermont	0.50			
17	North Carolina	1.00	35	Kentucky	0.49			
18	New Jersey	0.95	36	Michigan	0.46			

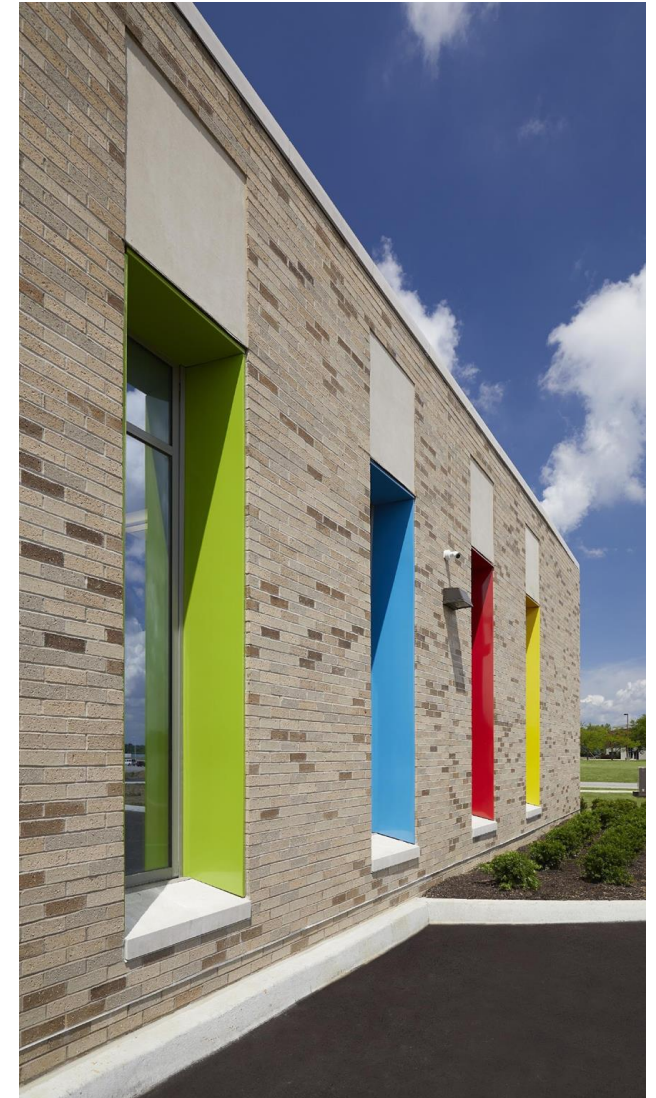
\*\* Washington D.C. 27.48

\*\* Not ranked because it is a federal district, not a state.

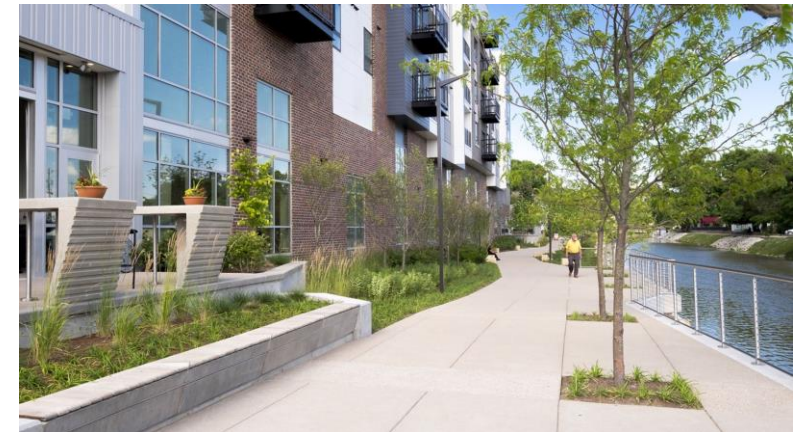


Data represents all LEED certified projects over the past decade (2012-2021) from BD+C, ID+C, O+M, and Homes. Data courtesy of the U.S. Green Building Council.

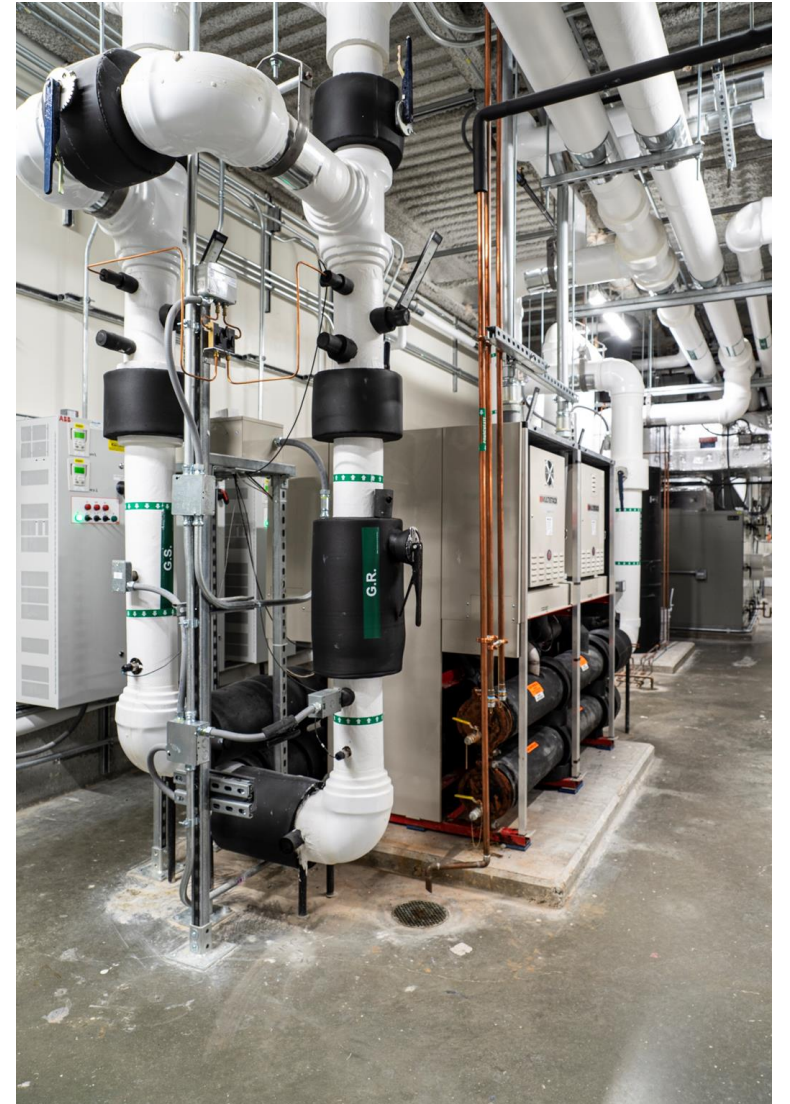
# Design for Shade & Reflectivity



# Design for Water Management



# Design for Energy & Carbon Efficiency





# How do we talk about this with developers?

## LONG-TERM VALUE

Lower expenses

Tenant retention

## ECONOMIC VALUE

Rising gas / energy costs

Resale value

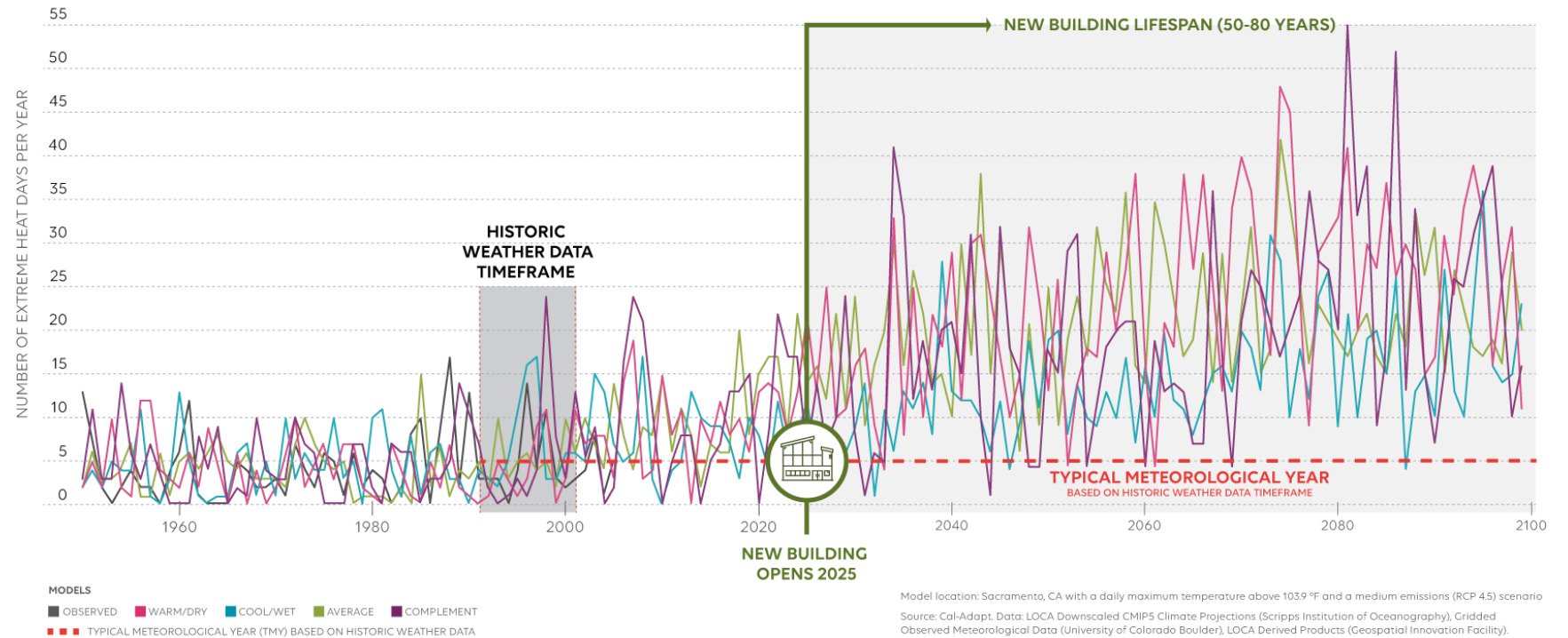
# Factors of Resale Value



**Resiliency**

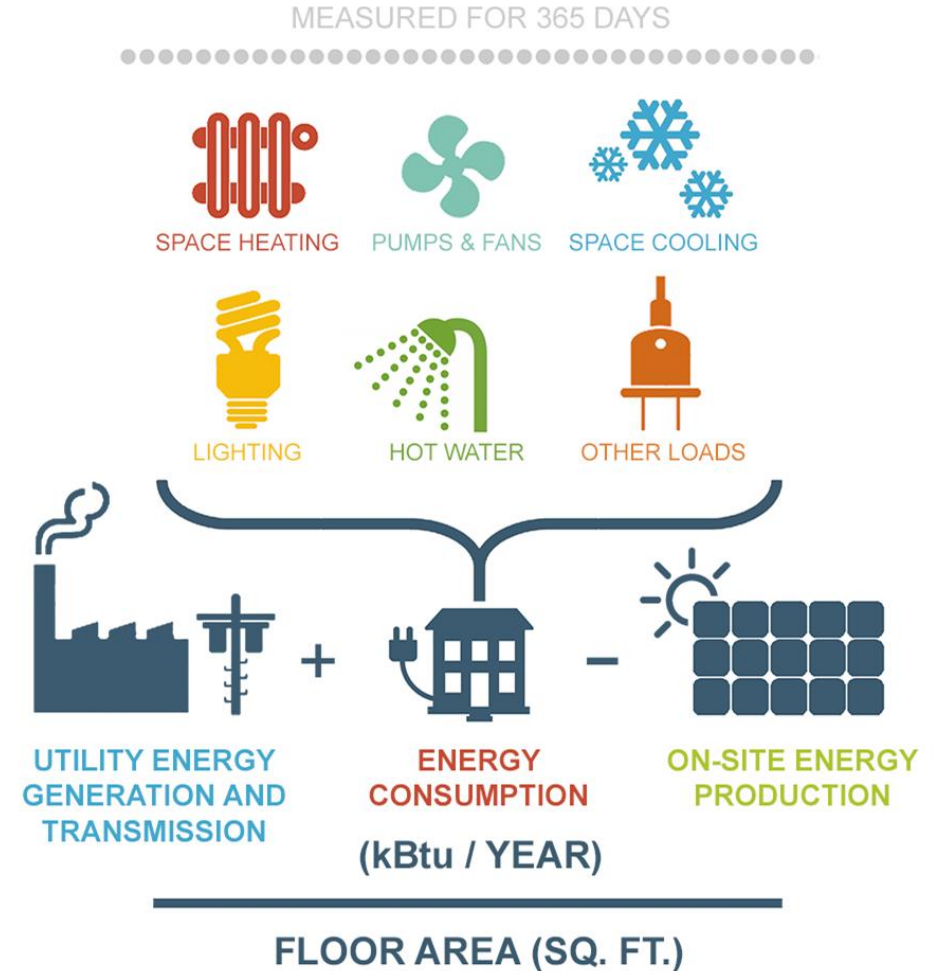
**REBUILD**

## RISKS OF USING HISTORIC WEATHER DATA FOR BUILDING DESIGN



# Lowering EUI as an investment

EUI is the “miles per gallon” rating of the building industry.



# How do we talk about this with our corporate clients?

## DEVELOPER

Tenant retention

Economic value

Long-term value

## CORPORATE

Employee retention

Energy consumption

Company Valuation

# Cost Impact: 2016 Code on Corporate Project

Located in Indiana (2007 Code)

150,000 SF @ \$325/SF = \$48,750,000 Budget

0.89% Cost Increase = \$433,875

\$0.47/SF/yr Energy Savings = \$70,500/yr

**6.1 YEAR PAYOFF**

**440 TONS/YR OF CO2 AVOIDED**

# Larry Fink's 2020 Letter to CEOs

**Will cities be able to afford their infrastructure needs as climate risk reshapes the market for municipal bonds?**

# Larry Fink's 2020 Letter to CEOs

**What will happen to the 30-year mortgage if lenders can't estimate the impact of climate risk over such a long timeline, and if there is no viable market for flood or fire insurance in impacted areas?**

# Larry Fink's 2020 Letter to CEOs

**How can we model economic growth if emerging markets see their productivity decline due to extreme heat and other climate impacts?**



# Corporate Sustainability

ESG (Environmental, Social, Governance) Investing is projected to grow 433% between 2018 & 2036.

By 2025, 33% of global assets under management are forecast to have ESG mandates.

Sustainable Investing in the United States 1995–2020








SOURCE: US SIF Foundation.

# Corporate Sustainability

## Exhibit 3: Sample Global Renewable Power Portfolio –

Impact Metrics Projected over Time Horizon of Portfolio<sup>a</sup>

		Dollarized Impact (US\$)	Impact Multiple <sup>b</sup>
<b>6</b> Clean water and sanitation 	Water savings from renewable power generation <b>141,021,789 m<sup>3</sup> water reduced</b>	<b>\$ 284m<sup>c</sup></b>	<b>0.23x</b>
<b>7</b> Affordable and clean energy 	Greenhouse gas emissions avoided <b>39,128,766 tons of CO<sub>2</sub> emissions avoided</b>	<b>\$ 1,737m<sup>d</sup></b>	<b>1.32x</b>
<b>13</b> Climate action 			
<b>8</b> Decent work and economic growth 	New jobs created <b>7,625 jobs created</b>	<b>\$ 239m<sup>e</sup></b>	<b>0.16x</b>
<b>11</b> Sustainable cities and communities 	Community engagement <b>US\$114m lifetime community contribution</b>	<b>\$ 114m<sup>f</sup></b>	<b>0.08x</b>
	<b>Portfolio Total</b>	<b>\$ 2,593m</b>	<b>1.78x</b>

Source: BlackRock 2021 TCFD Report

# Corporate Sustainability



# TCFD Emission Tracking



**SCOPE 1:**  
Direct Emissions  
generated on-site



**SCOPE 2:**  
Indirect Emissions from  
generation of purchased energy

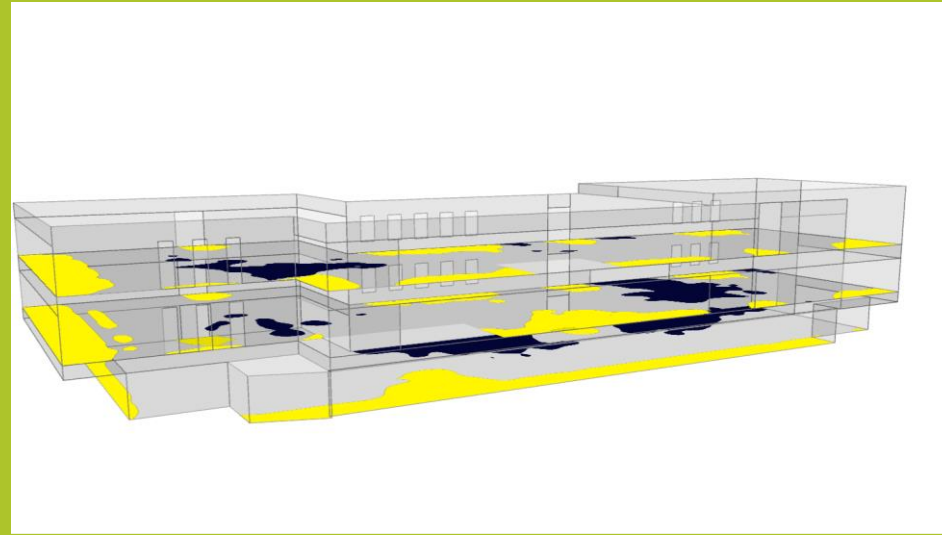


**SCOPE 3:**  
Indirect Emissions  
excluded from Scopes 1&2

# TCFD Emission Tracking: Applied to Projects



**SCOPE 1:**  
Avoid gas-fired equipment

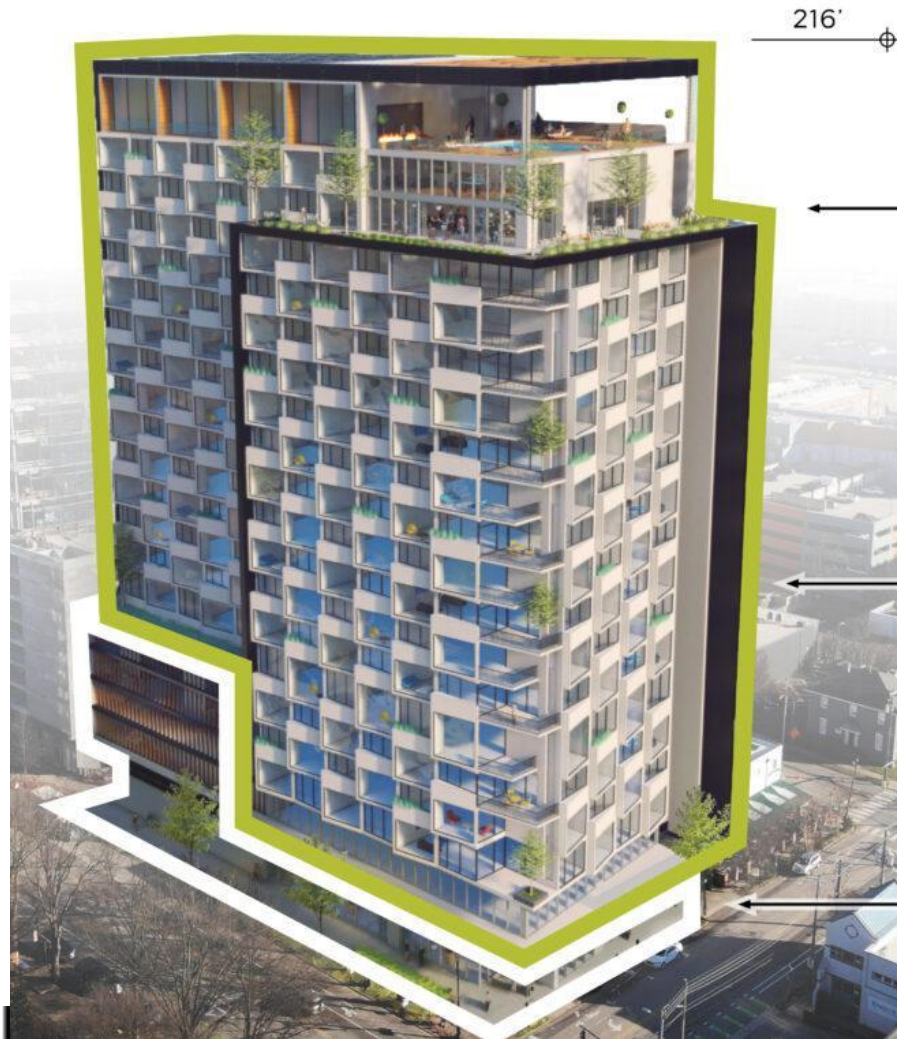


**SCOPE 2:**  
Maximize Energy Efficiency



**SCOPE 3:**  
Minimize Embodied Carbon

# Talking in Terms of Carbon Cost



216'  $\phi$

BUILDING EFFICIENCY  
ENHANCEMENTS OVER CODE MINIMUM

**295 T/YR**

CO2 EMISSIONS AVOIDED

MULTIFAMILY: 18 STORIES MASS TIMBER  
CONSTRUCTION IN LIEU OF CONCRETE

**39,000 T**

CO2 EMISSIONS AVOIDED

RETAIL/PARKING:  
2 STORY CONCRETE PODIUM

REBUILD

# Case Study: Elanco Global HQ



# Case Study: Elanco Global HQ

Elanco’s approach to sustainability and ESG is called **Elanco’s Healthy Purpose™**. It is how Elanco advances the well-being of animals, people, and the planet, enabling them to realize their vision of *‘Food and Companionship Enriching Life.’*

Through Elanco’s **Healthy Purpose™**, they contribute to the United Nations 2030



Elanco’s work is centered around **four inter-connected pillars:**



**Healthier Animals**

**Helping pets and farm animals live healthy, high-quality lives** by continuously expanding our existing portfolio, while also identifying **new and innovative animal care products, practices and services.**



**Healthier People**

**Improving people’s lives and livelihoods by promoting animal companionship and enabling sustainable production of meat, milk, fish and eggs.**



**Healthier Planet**

**Minimizing our environmental footprint, while leveraging product and service innovations to help our stakeholders advance their sustainability efforts.**



**Healthier Enterprise**

**Growing our business with integrity and excellence** with respect to all stakeholders, where all employees feel safe, engaged and accountable as owners.

**REBUILD**



“We are united by the belief that, through **healthier animals**, we can tackle some of the most pressing issues of our time.”

**Jeff Simmons**  
*President and CEO, Elanco Animal Health*



# Case Study: Elanco Global HQ



## ENERGY/EMISSIONS

**POTENTIAL CARBON EMISSIONS AVOIDED (TONS OF CO<sub>2</sub>)**

**2000T /YR**

## STRATEGIC LOCATION

NEW LOCATION NEAR AIRPORT  
(50 AIRPORT TRIPS/WEEK)

## EMBODIED CARBON REDUCTION

TIMBER ROOF IN COLLAB. AREA  
(2500T BY 2050)

## ENHANCED BASIS-OF-DESIGN

DESIGN TO 2016  
ENERGY STANDARD

## DESIGN OPTIMIZATIONS TO STUDY

OPTIMIZED CHILLED  
BEAM HVAC SYSTEM

HIGH-PERFORMING  
ENVELOPE SYSTEM

ADVANCED LIGHTING  
& HVAC CONTROLS

## ON-SITE GENERATION OPPORTUNITY

SOLAR ARRAY OVER  
ABOVE-GRADE PARKING

The Elanco Animal Health planned global headquarters in Indianapolis is currently in the design phase. Our current expectations and assumptions may not be viable as move beyond the design to the build phase of the project due to uncertainties, risks and changes in circumstances and the environmental qualities of the as-built structure may differ from our current expectations.



Elanco

# Case Study: Elanco Global HQ

Maximize Energy Efficiency  
Adopt ASHRAE 90.1-2016

Utilize City's District Thermal  
Eliminate on-site gas heat

Incorporate on-site renewable  
Plan infrastructure for future through  
masterplan

Framework established in Concept Design  
prepared the team to respond with ease to  
questions regarding pursuit of LEED in  
Schematic Design.



**REBUILD**

The Elanco Animal Health planned global headquarters in Indianapolis is currently in the design phase. Our current expectations and assumptions may not be viable as we move beyond the design to the build phase of the project due to uncertainties, risks and changes in circumstances and the environmental qualities of the as-built structure may differ from our current expectations.



# A great place to be IF.....



An aerial photograph of Cincinnati, Ohio, taken at dusk. The skyline is filled with various skyscrapers, some of which are illuminated. In the foreground, a large stadium with a distinctive white, lattice-like roof structure is visible. The city is surrounded by greenery, and a river flows through the scene. The overall atmosphere is one of a vibrant, modern city.

**The future of design in U.S. Midwest is worth the fight, and all of the little milestones will lead us there.**

# Session Roadmap

**A** Prelude

**B** Act I: The State

**C** Act II: The City

**D** Act III: The Practice

**E** Discussion



## Discussion



**RE**BUILD



**Thank you!**

**REBUILD**

# **Matters of the Heartland: Sustainable Advocacy in the Midwest**

October 5, 2022 9:15 AM

1.0 Learning Units

**RE**BUILD