



Net Zero Building Adoption

The road to a more
sustainable & efficient
building footprint

DUCKER  CARLISLE



A Net Zero Future

The built environment is responsible for **42%** of global carbon emissions, of which **27%** is attributable to building operations such as heating and lighting.

Net Zero Energy Building is forecasted to grow at an accelerated rate as the IRA 2030 target nears, and high-performance building products and materials more actively contribute to this trend.

Stakeholder Collaboration

should begin early in the design process

As stakeholders attempt to reduce operational emissions, energy efficient building products such as **HVAC, Roofing and Building Envelope Products** and materials will become **more critical** in **reducing thermal bridging** and other causes of energy waste.

Stakeholders

Builders & Contractors

Building Code Agencies

Building Owners

Designers

Product & Equipment Manufacturers

Architects



Drivers of Growth

Influencing Factors of Net Zero/Ultra Low Energy Building Adoption Growth

Federal Policy

State Policy and Building Codes

New Products & Design Solutions

Design
Community
Acceptance

Economy &
Environmental
Factors



Drivers of Growth

Influencing Factors of Net Zero/Ultra Low Energy Building Adoption Growth

Federal Policies

The Inflation Reduction Act (IRA) of 2022 explicitly makes net zero targeting for 2050 a national policy, and highlights **building emissions** as a **critical area** to **reduce emissions**.

The Infrastructure Investment and Jobs Act (IIJA) of 2021 spurred the creation of the Building Performance Standards Coalition with the stated policy goal of **upgrading 4 million buildings by 2024**.

However, Net Zero targets and supporting legislation have uncertain future due to political polarization on issues related to climate change.



Net Zero Targets

are part of a globally coordinated policy effort to fight global warming

GHG emission reduction policies

are contentious and therefore have an uncertain future in the US.

However, with the US rejoining the Paris Agreement in 2021, followed by the historic passage of the Inflation Reduction Act in 2022, ***GHG***

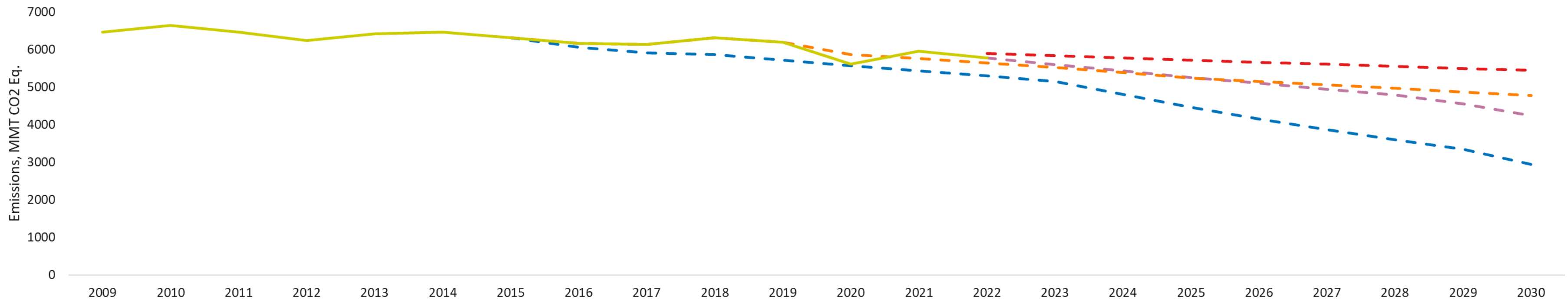
emission reduction has been reprioritized.



US Emission Policy Scenarios



— Paris Climate Accord
 — Inflation Reduction Act
 — Obama Era NDC
 — Federal Inaction
 — Historical



Obama administration announces goal to cut GHG emissions by 17% from 2005 levels by 2020 as part of the administration's first Climate Action Plan

Trump administration formally leaves Paris Climate Agreement (intentions announced in 2017)

Biden administration signs Inflation Reduction Act, which mandates a 40% reduction of GHG emissions of 2005 levels by 2030

Drivers of Growth

Influencing Factors of Net Zero/Ultra Low Energy Building Adoption Growth

State Policies and Building Codes

Over 20 states have announced **net zero targets by 2050**, with commercial buildings representing a critical part of the net zero strategy.

Numerous states and municipalities have adopted or are in the process of **adopting improved building energy performance standards**, assisted by the IRA and IIJA funds.



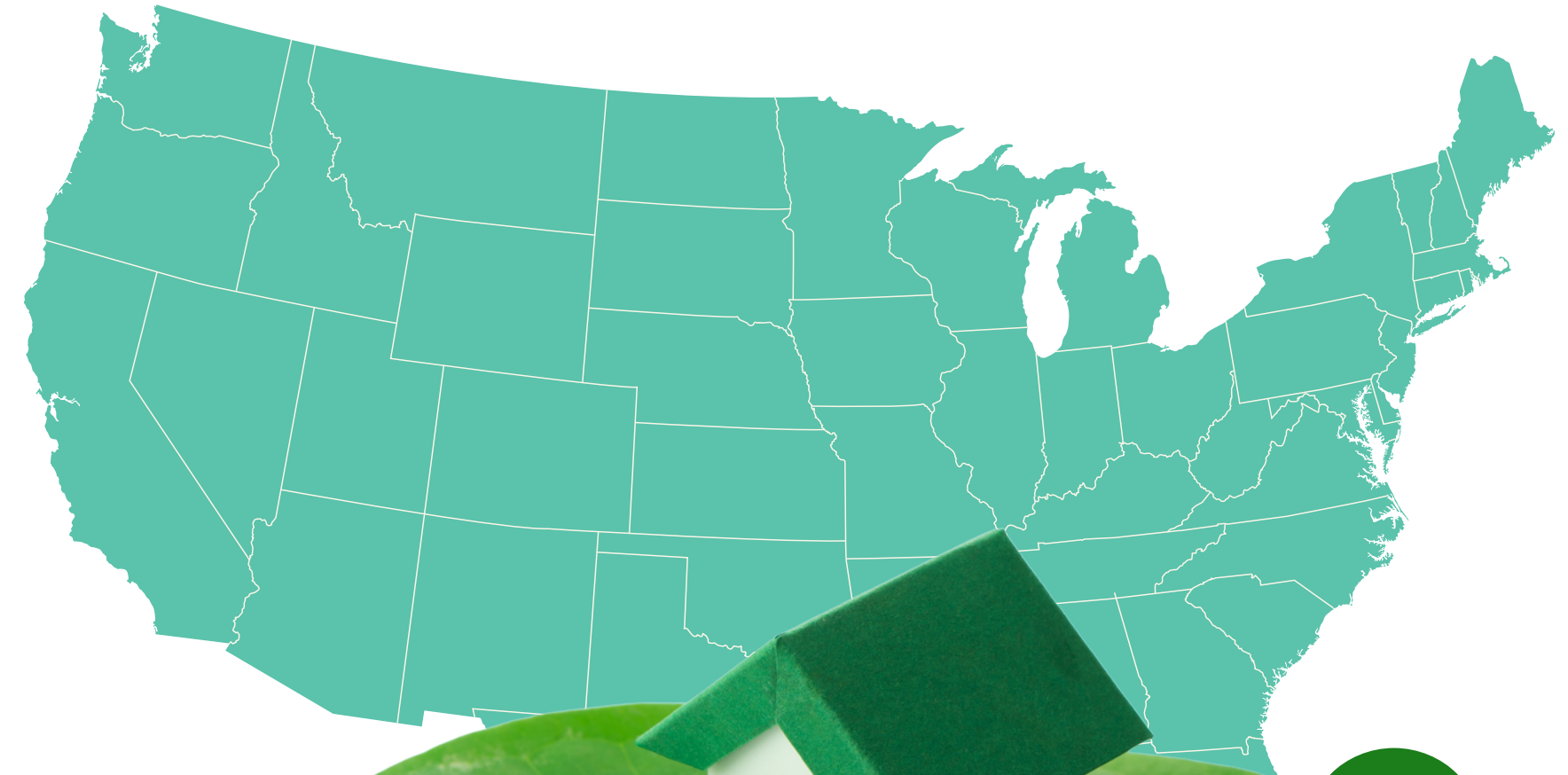
State Policies & Building Codes

The Drive for Efficiency

All states have implemented policies and programs to promote energy efficiency in buildings.

Included Policies and Programs

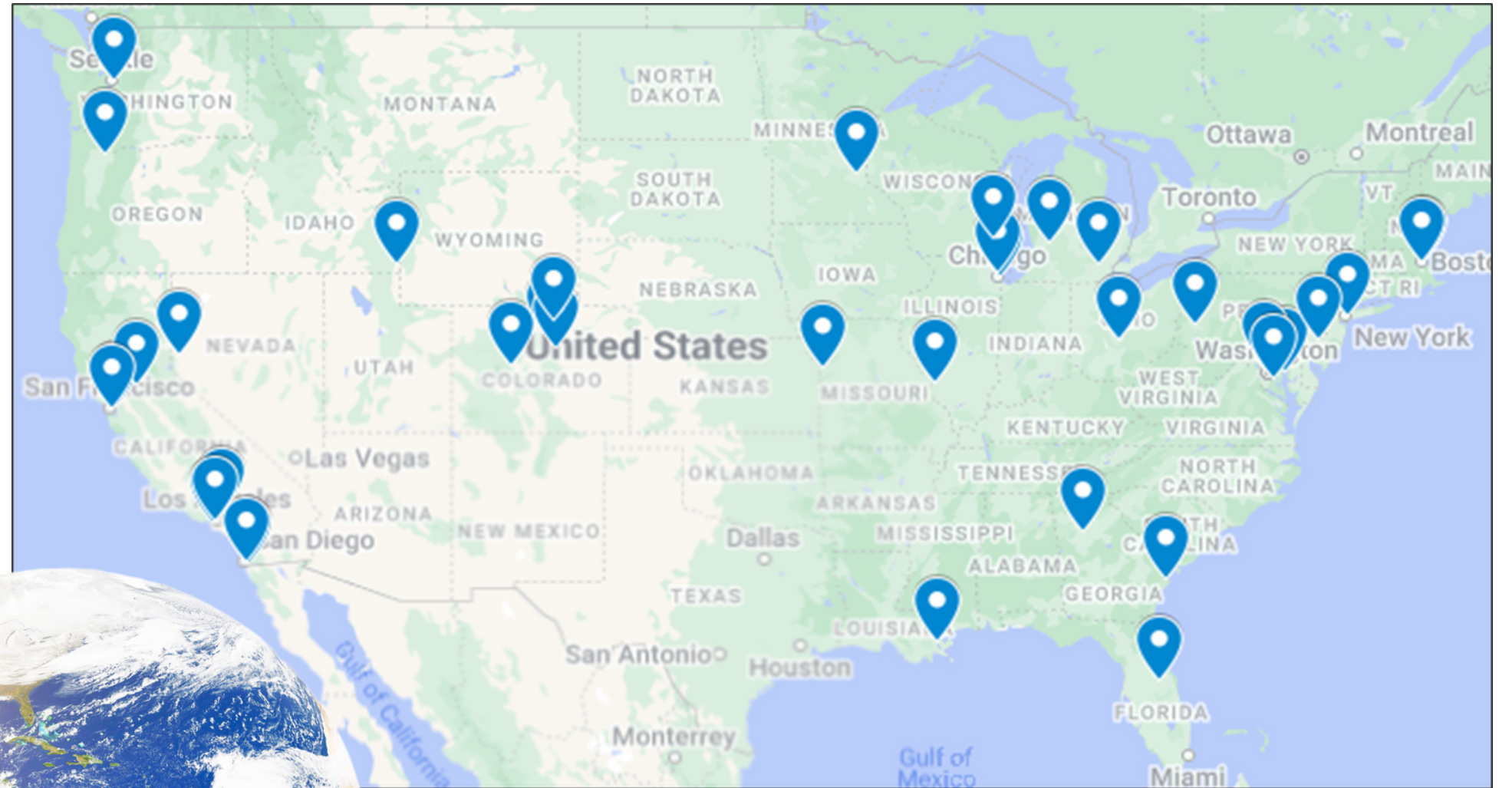
- ✓ Building Energy Codes
- ✓ Energy Standards for Public Building Groups
- ✓ Green Building Incentives



Municipalities Stepping Up

The National Building Performance Standards Coalition

currently includes **4** states and
38 municipalities committed to
implementing building performance
standards by Earth Day 2024.



The National BPS Coalition

is supported by federal funds from the
Bipartisan Infrastructure Act of 2021 and
IRA, with more than \$1.7B allocated to
support local policies.

Drivers of Growth

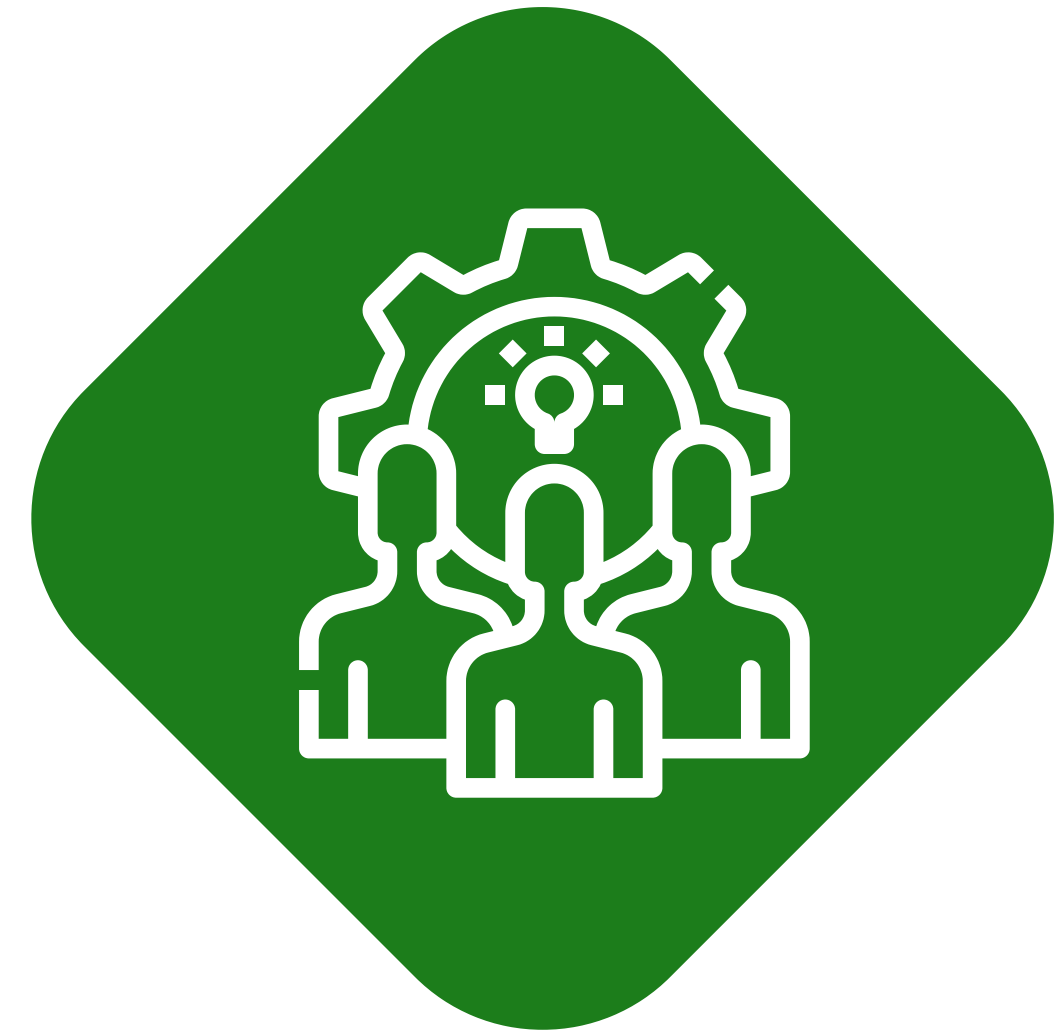
Influencing Factors of Net Zero/Ultra Low Energy Building Adoption Growth

Design Community Acceptance

Design community initiatives advocate Net Zero Energy Building (NZEB)

and encourage firms to adopt NZEB goals.

2030 Challenge (carbon-neutral by 2030) adopted by **80%** of **top 10** and 70% of top 20 architecture/engineering/planning firms in the U.S.



Net Zero and Ultra Low Energy Building Adoption

To support federal GHG emissions targeting, the Inflation Reduction Act has introduced a number of policy incentives in order to implement net zero goals

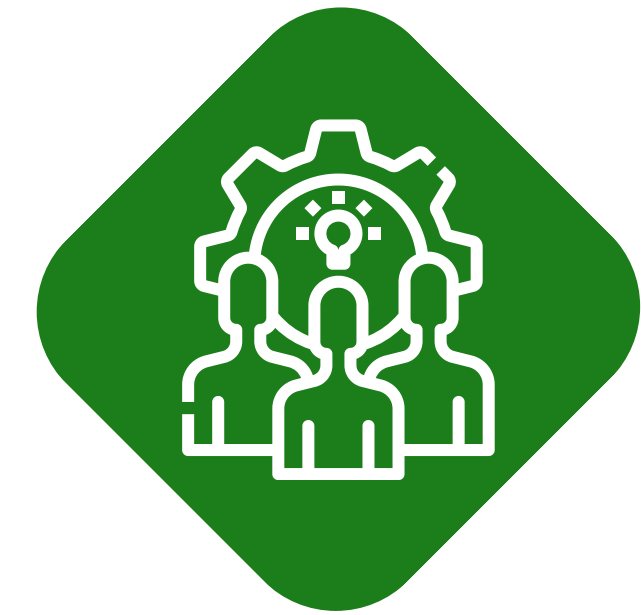
including increased access to financing for government and institutional NZEB construction (Greenhouse Gas Reduction Fund) and tax deductions for **Commercial and Multifamily NZEB construction** (Tax Deduction for Energy Efficient Commercial Buildings).



The Inflation Reduction Act

Net Zero and Ultra Low Energy Building Adoption

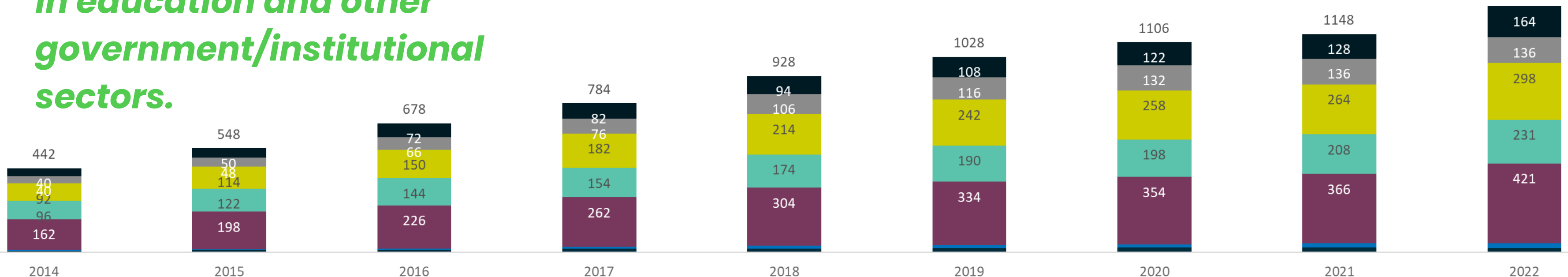
historically has been most concentrated in government and multi-family



Strong policy support on state and local levels, as well as **community buy-in**, have historically driven NZEB/ULEB adoption **growth in education and other government/institutional sectors.**

NZEB/ULEB Historical Adoption
Nonresidential and Multifamily # of Buildings

Commercial Healthcare Education Multifamily Office Government and Institutional Other



Drivers of Growth

Influencing Factors of Net Zero/Ultra Low Energy Building Adoption Growth

Economy & Environmental Factors

Better macroeconomic conditions

favor more construction and spending on green energy technologies.

Extreme weather conditions magnifying the importance of

superior building performance
and ***energy efficiency.***

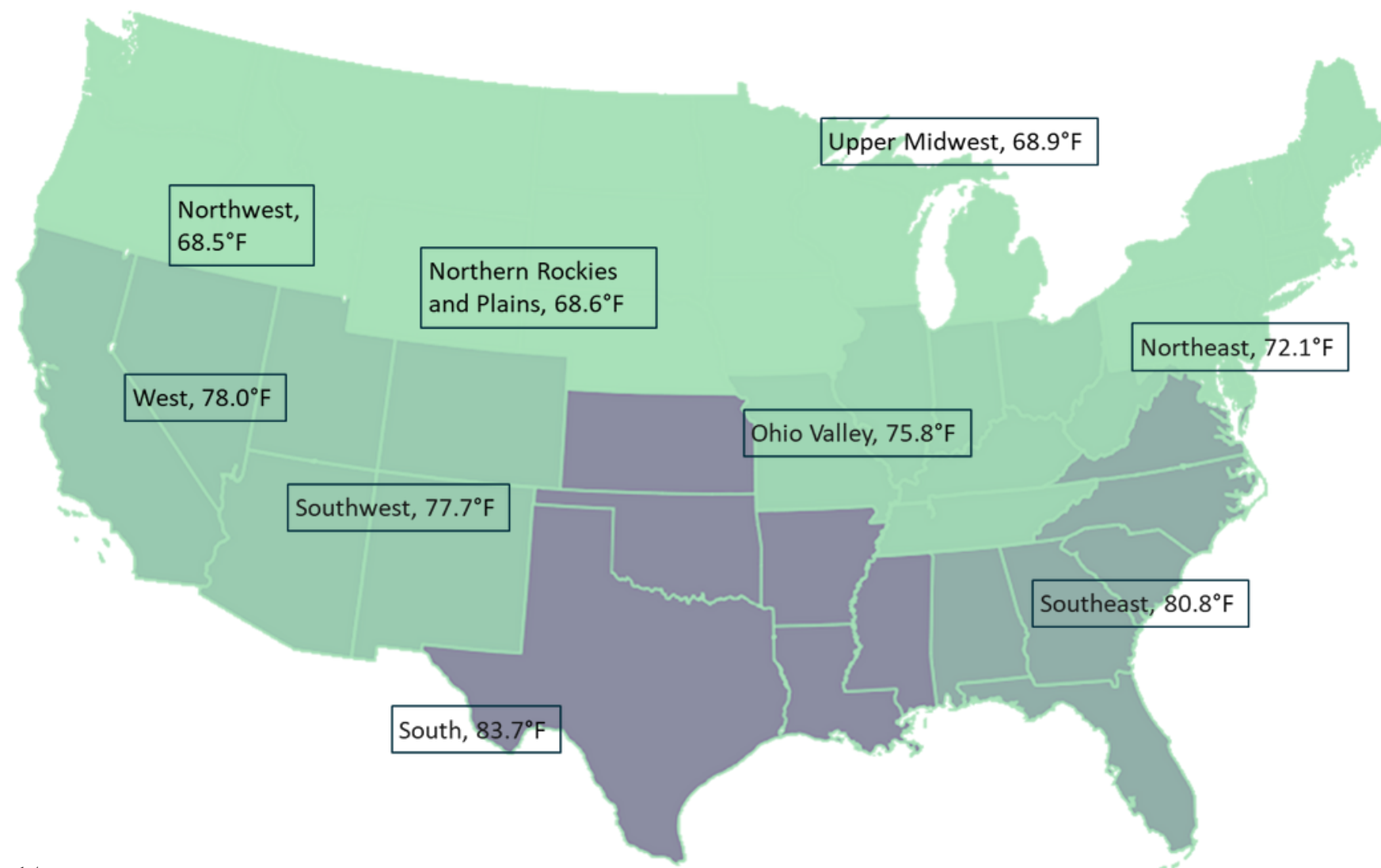


Energy Performance

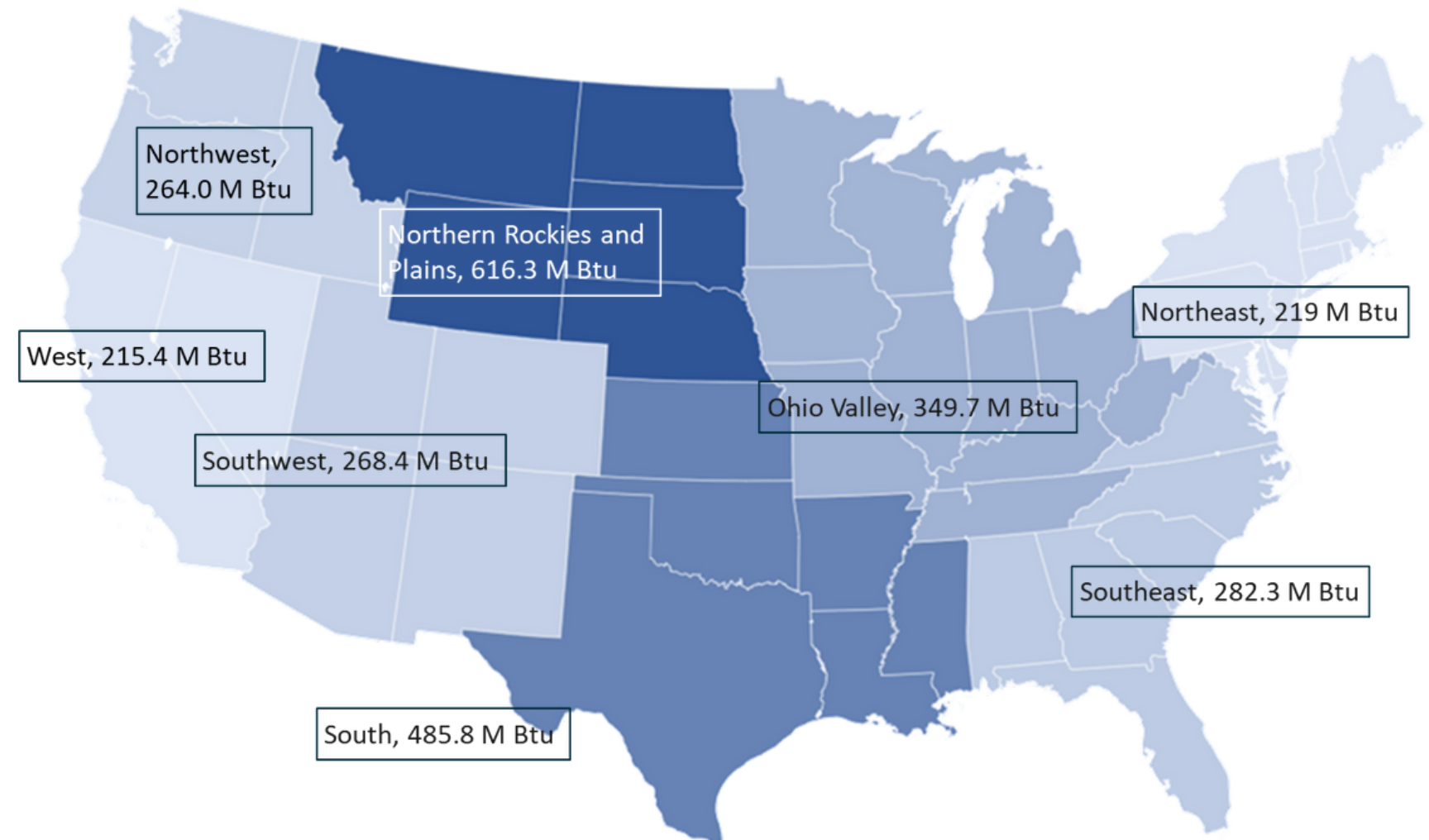
In addition to Federal and State policies, **extreme temperatures** both hotter and colder, necessitate **better building energy performance**.



NCEI Climate Region Mean Temperatures (°F)



NCEI Climate Region Mean Electricity Usage Per Capita

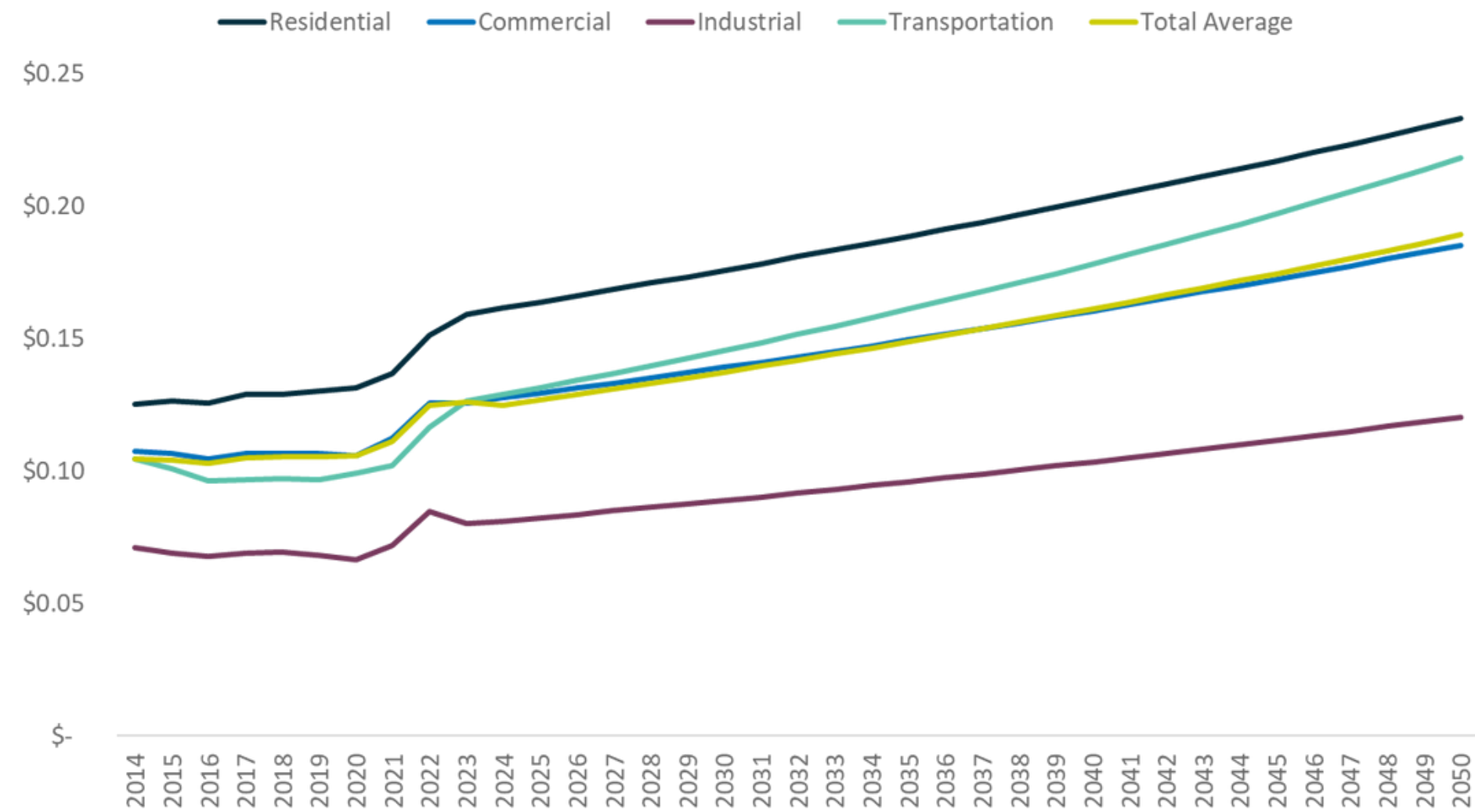


The Push For NZEB/ULEB

Increasing electricity prices continue to push NZEB/ULEB adoption rates.



US Electricity Prices By Consumption Sector \$/KwH



National average electricity prices have increased ~20% since 2014

Drivers of Growth

Influencing Factors of Net Zero/Ultra Low Energy Building Adoption Growth

New Products and Design Solutions

Material and product availability, holistic approaches, and stakeholder education

will help producers, suppliers, architects, designers and contractors realize NZEB adoption potential.





Collaboration of Influences

1

Availability of High Performance Materials & Products

In times of supply chain disruptions and volatility, it has become even more critical to have access to and ensure the availability of high-performance materials. With new materials, product and system manufacturers are producing higher performing and cost-effective solutions.

2

System Solutions

Energy cost savings-driven sales can be unlocked by an integrated systems and solutions approach, where multiple building products and materials across different applications can be designed, combined and built with the expressed goal of maximizing energy efficiency and complying with local code and regulations.

Leveraging the use of BIM and other technologies, stakeholders can collaborate with ease to realize efficiency goals across trades and products.

3

Stakeholder Education

With the availability of information and the passage of numerous incentives at multiple levels of government, stakeholders now have more tools than ever to learn about and implement improved building performance and net zero standards. As the the attractive lifecycle cost savings of using high performance materials and innovative designs becomes known, adoption will accelerate.

Products and Design Solutions

Building products that increase energy cost savings and reduce building emissions **contribute to strong NZEB/ULEB growth.**



Examples

HVAC

Distributed Systems, Energy Recovery Systems, Ground Source Heat Pumps, CO2 Refrigeration

Building Envelope

Continuous Insulation, Integrated Sheathing, EIFS, Butyl and Acrylic-Based Flashing

Roof Insulation

High Thickness Polyiso Board

Cavity Insulation

Spray Foam Insulation, Mineral Wool

Mechanical & Pipe Insulation

EPDM, Aerogel

Energy Efficient Low Slope Roof

Lightly-Colored or Reflective Cool Roofs, Green Roofs, Solar Roofs, Metal Roofs

Energy Efficient Windows

Adaptive Shading, Designing for Daylight, Low-E Glass Windows, Fiberglass Window Frames

Energy Efficient Doors

Fiberglass Exterior Doors, Aluminum Storm Doors, Insulated Steel Doors

Energy Efficient Lighting

LED Lighting, Demand-Response Systems, Adaptive Luminescence

In Summary

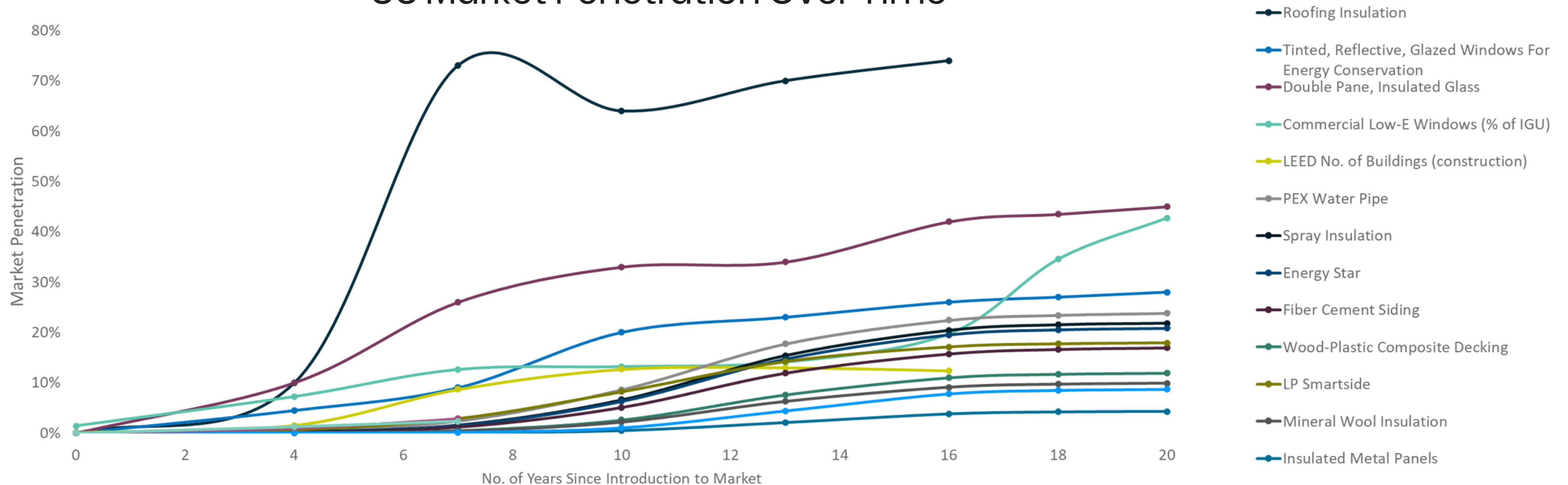
Innovative products that ***provide energy*** savings display higher rates of adoption than other new building products and practices surveyed, with ***penetration*** hitting an average of ***~28% at the 18-20 year threshold.***

Energy cost savings and regulatory conditions are significant drivers of new building product/material adoption

In Summary

The historical and projected adoption rate of **net zero energy building** is consistent with other energy efficient product adoption rates, **hitting 27-30% penetration** of new construction by 2030 due to energy cost savings, designer community buy-in and regulatory conditions.

US Market Penetration Over Time



In Summary

Although there is reasonable dispute over whether or not 2030 net zero targets will be achieved given the volatility of the federal and state/local regulations policy environment, **market conditions** such as elevated energy prices **coupled with new, higher performing building materials and design practices** likely will drive exponential growth.

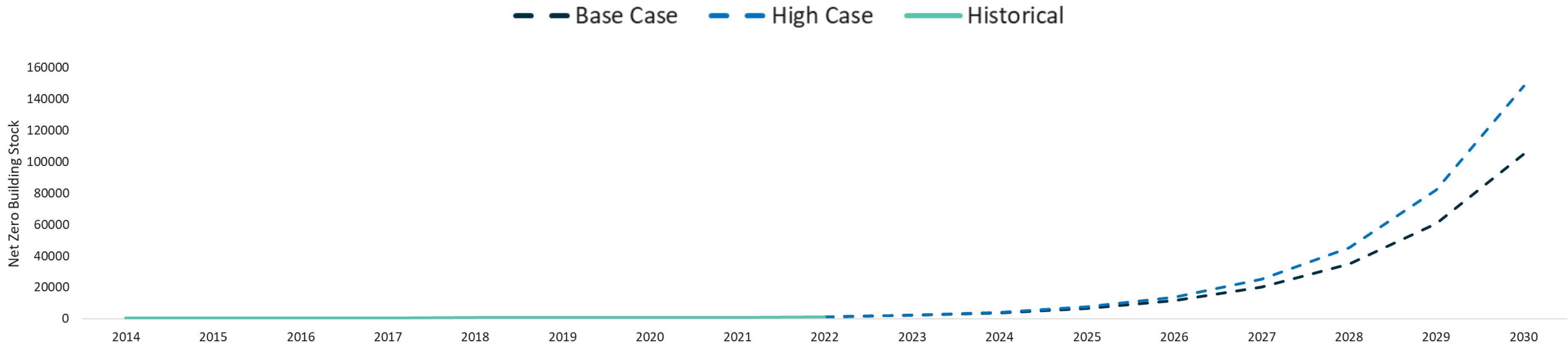
NZEB adoption will grow exponentially

With strong policy support and rapid increase in private investment coupled with design community buy-in and growing demand for energy-savings products and solutions.

In Summary

Supported by energy cost savings and federal, state, and local policies to implement net zero targeting, the number of **NZEB/ULEB** will grow at a **CAGR** range of **~73%-81%** from 2023 to 2030.

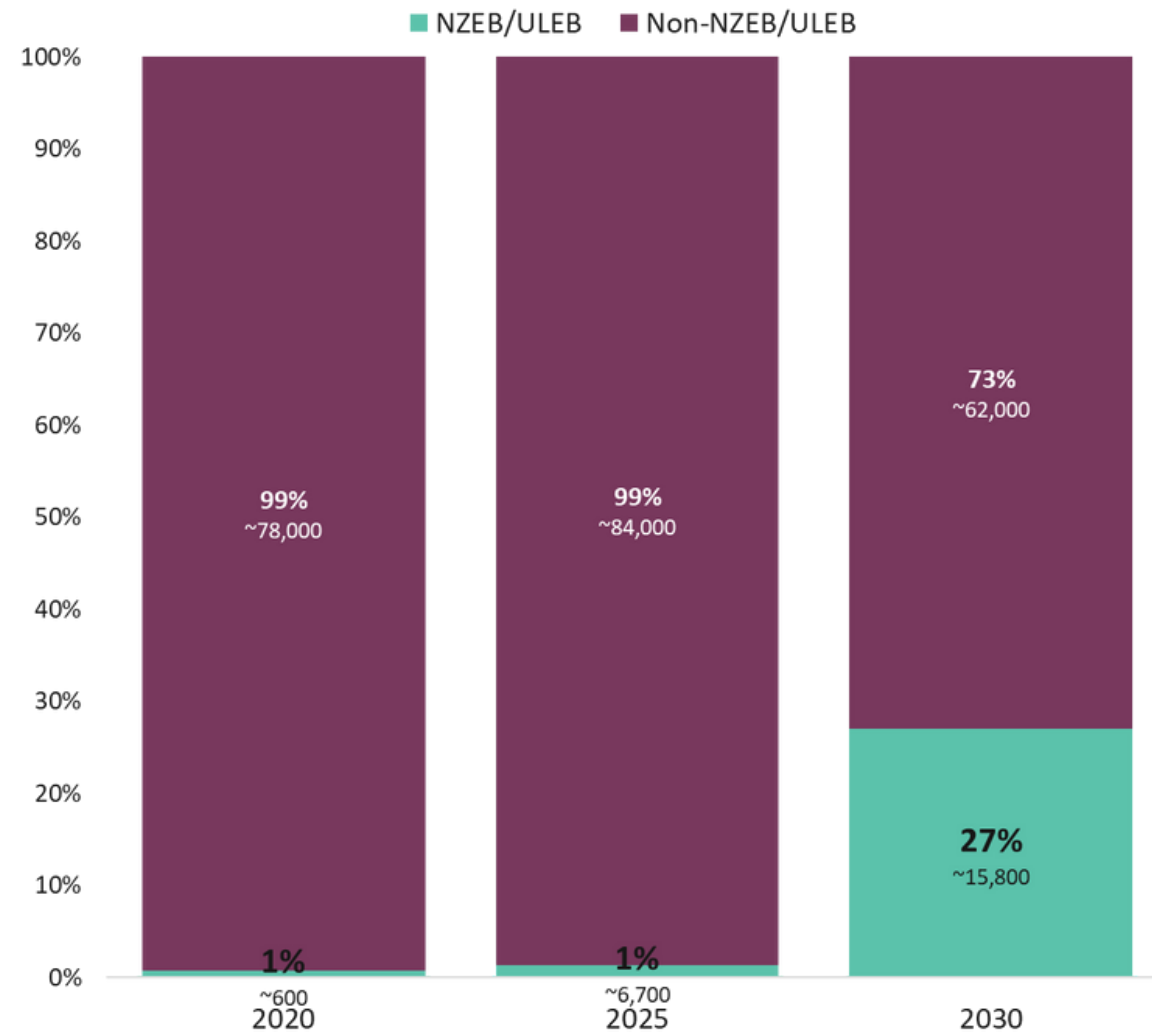
US NZEB/ULEB Adoption Scenarios



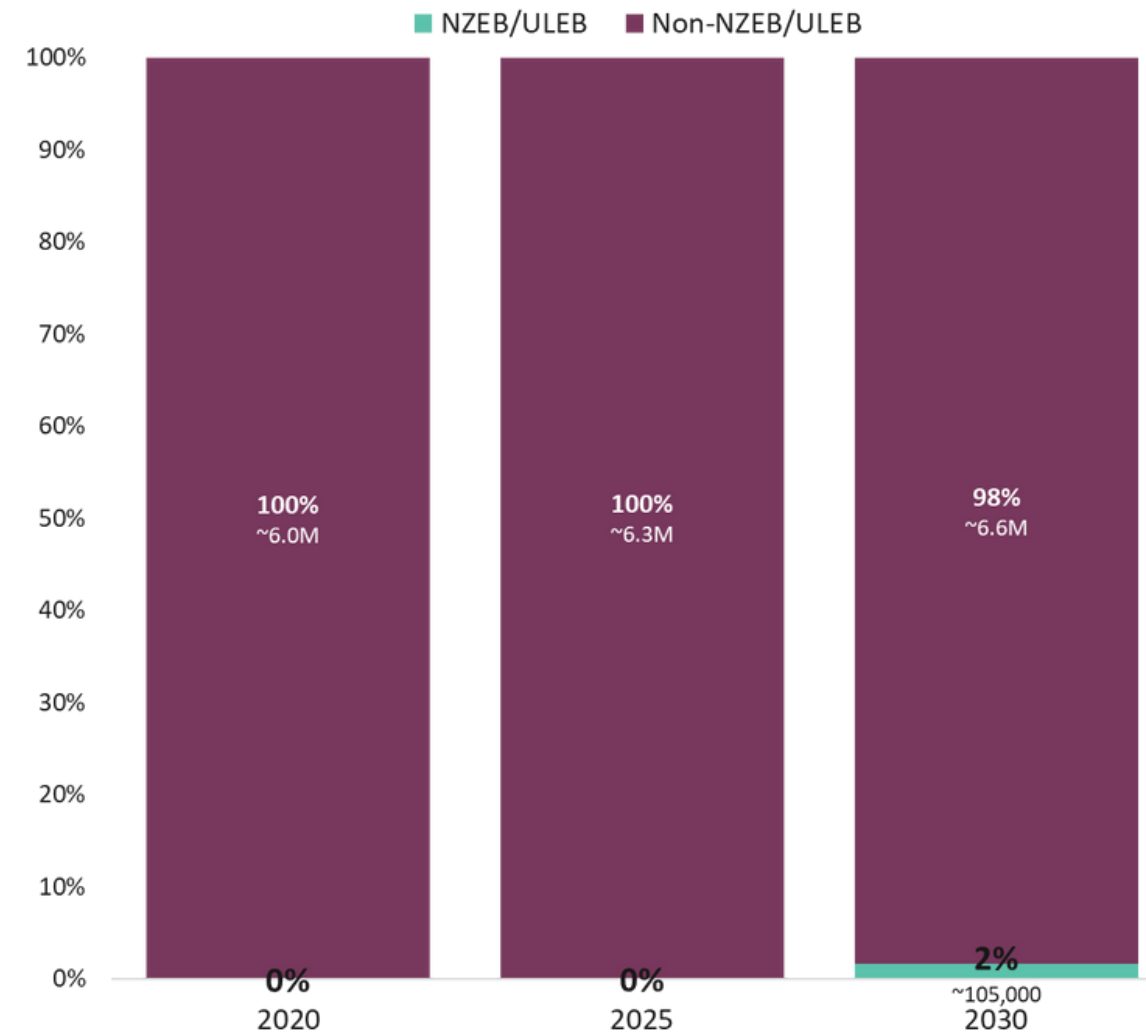
In Summary

By 2030....

NZEB/ULEB Penetration - U.S.
- Annual New Construction in # of Buildings -



NZEB/ULEB Penetration - U.S.
- Building Stock in # of Buildings -



penetration of NZEB/ULEB is expected to reach **~27%** of new nonresidential construction and **2%** of all buildings in the US.

DUCKER  CARLISLE

Project Team

Our accomplished team has the trust and confidence of top companies in key global sectors.



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References

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About Ducker Carlisle

Ducker Carlisle is a global consulting and M&A firm backed by decades of industry experience, proprietary data, and proven solutions to optimize client growth and performance.

We leverage 60+ years of experience and proprietary data to enhance revenues, improve margins, and mitigate risks for our clients in today's shifting global economy. Our work is rooted in our core values — collaboration, commitment, inclusivity, integrity, and scientific curiosity — and we strive to demonstrate these daily to our clients and one another.

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