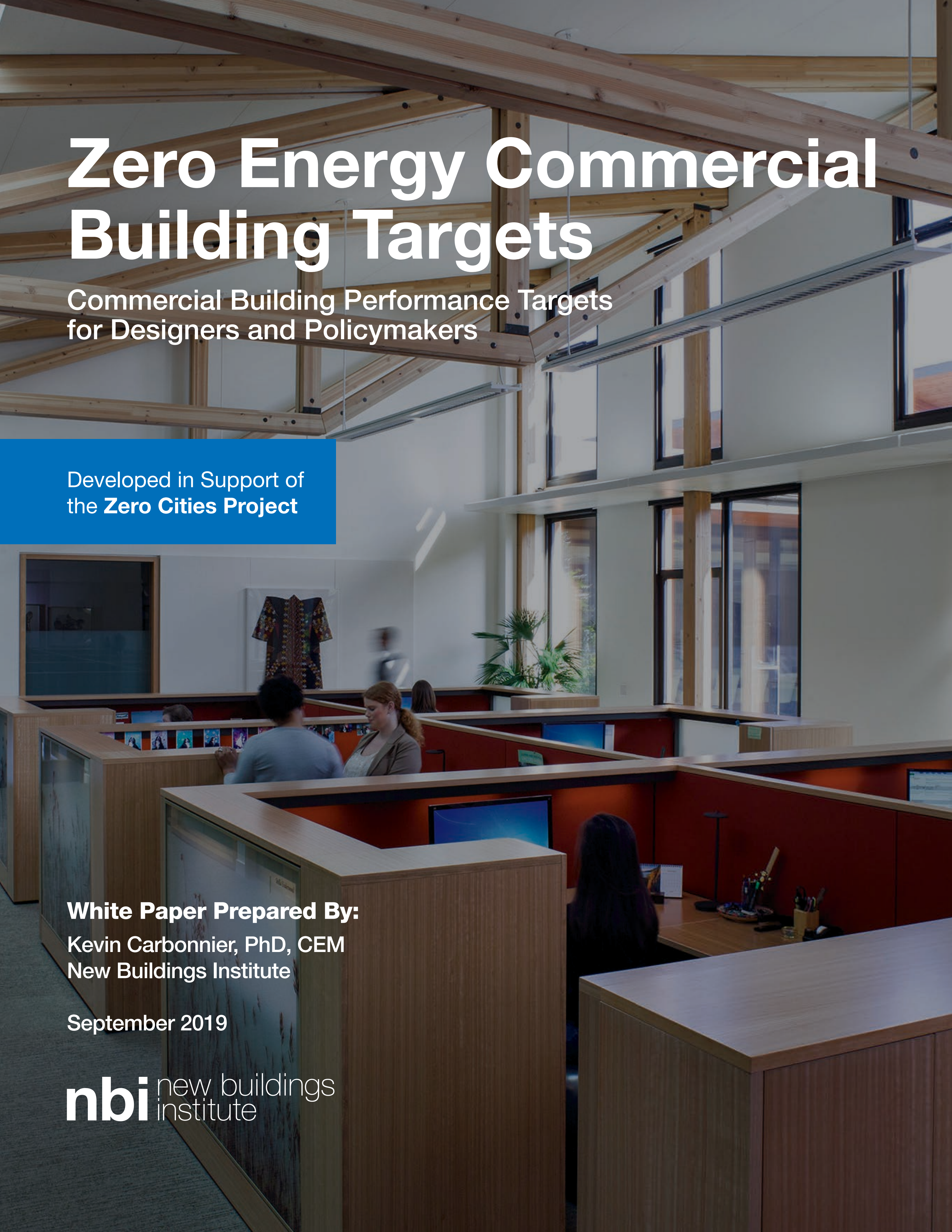

Zero Energy Commercial Building Targets

Commercial Building Performance Targets for Designers and Policymakers

Developed in Support of the **Zero Cities Project**

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This report is a product of the **Zero Cities Project (ZCP),** a three-year effort supporting both cities and their most impacted communities. The goal of the project is to co-develop and implement actionable and equitable roadmaps and policy strategies to achieve a zero-net-carbon (ZNC) building sector by 2050. Through a community collaboration process that aims to lead with equity and leverage technical analysis, the project will create shared roadmaps, a suite of tools, and a refined, replicable planning model to support a broad network of cities in achieving a ZNC building sector.

The Need for Targets

This report outlines zero energy performance targets for new construction. Zero energy buildings are typically the most efficient in the market, surpassing even the most stringent energy codes on the market today. Designers, policymakers, and owners who are targeting zero energy buildings, whether for energy cost savings, carbon savings, occupant wellness, overall sustainability, or even status often look for guidance on the crucial first question: "Where do I start?".

The critical first step in achieving a zero energy building is to set an energy target. Where that target lands, particularly for building types outside of offices, has largely remained open-ended. Policymakers with climate action plans, emission reduction targets, energy reduction goals, or other sustainability commitments are also looking to leverage energy targets to drive down energy use and emissions in buildings at scale through building policies. Targets that address whole-building energy use are also effective tools to overcome barriers in the existing energy code framework to move the market toward zero energy and high performance buildings. This report provides guidance to answer the question of "Where do I start?"

Target Setting for Success

Alongside NBI, many entities in the high performance building industry recommend setting energy targets, including EnergyStar,[1] the Energy Trust of Oregon,[2] and Architecture 2030,[3] to name a few. Setting an energy target focuses the design team and gives the owner, architect, engineer, contractor, and other team members a common goal for the project. Research conducted by NBI[4] revealed that of the 23 zero energy buildings studied, the design teams of every project believed that setting an energy target early in the design process was critical to achieving zero energy performance.

The energy targets we propose in this report are energy use intensities (EUI), measured in kBtu/ft^2 per year. Every metric has strengths and weaknesses. We decided to use EUI because it is commonly used and easy to measure or calculate. EUI is a good metric for buildings types whose energy consumption is strongly correlated with size (square feet); this is the case for the building types covered in this report.

With an established energy target, decisions regarding the design that impact the performance of the building are reframed in the context of meeting that target, which can bring cost-effective design solutions forward, including optimal orientation, passive design strategies, window-to-wall ratios, wall section design, glazing selection, HVAC system type, and many other decisions that determine the energy performance of a building.

On the policy side, targets are effective tools to move the market toward meeting energy, emission, or cost goals. Energy targets fit into building policy in several ways, including performance pathways (modeling), outcome-based approaches (metering), incentives and penalties, and other innovative mechanisms. Incorporating energy targets gives policies a long-term vision and prime the building community to design, build, and operate buildings to new, high performance standards that ultimately save operational costs, emissions, and energy.

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1 https://www.energystar.gov/buildings/service-providers/design/step-step-process/set-target

2 https://www.energytrust.org/wp-content/uploads/2017/12/17.12.07_HPDT_Performance_Based_Procurement.pdf

3 https://architecture2030.org/2030_challenges/2030-challenge/

4 https://newbuildings.org/resource/zero-net-energy-building-controls-characteristics-energy-impacts-and-lessons-learned-research-report/

Where are Targets Now?

Energy targets have already entered the market via energy codes and jurisdictional policies. Moving the market toward high performance building standards will support individual buildings looking to reduce their carbon footprints and save money on energy and support a market-wide effort to reduce energy use at scale via building codes and policies.

Many jurisdictions, including private building owners, school districts, cities, and entire states have set energy and carbon reduction goals.[5] These goals typically include a system-wide reduction in energy or emissions by a certain date. For example, a city may wish to reduce the energy consumption of their buildings by 30% by the year 2040, as compared to their 2010 baseline. Energy targets (performance in individual buildings) for commercial and multifamily buildings are a great tool for these jurisdictions to meet their energy and emission reduction goals. Targets address individual buildings, while goals focus on groups of buildings, citywide energy use, renewable portfolio, or other large-scale initiatives adopted by jurisdictions.

Jurisdictions with Energy Targets

NBI has worked with several jurisdictions to establish energy targets for individual buildings and groups of buildings via policy recommendations. Examples of energy target implementation are listed below in order to highlight some of the leaders in this field.

Seattle Energy Code

The 2015 Commercial Seattle Energy Code[6] includes an alternative compliance path that sets an energy target for the proposed building. This target performance path sets an EUI requirement to be met both via modeling and in operation. The building must perform to the energy target level (annual energy use) within a three-year window after occupancy.

City of Boulder, Colorado

The City of Boulder is plotting a pathway for its energy code down to zero energy performance by 2030. Each code cycle ramps down an energy target for various building types, ultimately reaching “zero energy ready” performance targets. The city has customized the targets and pathways for each building type to suit their goals and market specifically.

California Department of General Services

The California Department of General Services (DGS) has published source energy use intensity targets for existing state buildings pursuing zero net energy.[7] These targets support California’s goals of reaching a 100% clean electric grid by addressing the energy demand from existing buildings.

What’s Not Included

These targets represent pre-renewable (i.e. the total energy consumption of the building without discounting energy generation from renewables) performance of zero energy buildings are a resource for designers and policymakers to set attainable high performance targets.[8]

Energy use in buildings, both predicted (modeled with software) and measured (metered in existing building), depends on multiple complex systems, including design decisions, human behavior and weather patterns. Further, individual

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5 NBI also tracks jurisdictional policies here: https://gettingtozeroforum.org/policy-resources/

6 http://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)/energy-code

7 https://www.dgs.ca.gov/OS/Resources/Page-Content/Office-of-Sustainability-Resources-List-Folder/Zero-Net-Energy

8 ASHRAE has published zero energy design guides for K-12 schools and small-to-medium office buildings: https://www.ashrae.org/technical-resources/aedgs

buildings are unique, each with varying combinations of operating hours, process loads, equipment in the building, and other variables affecting consumption. In order to provide accessible guidance and a starting point for high performance design, the targets presented in this report do not include normalizations (i.e. adjustments to baseline target values) beyond climate zone and building type.

Climate and building type are primary predictors of energy use in buildings. They are included in this report but are not sufficient for all situations. For example, buildings with data centers, 24/7 operation, partial occupancy, or other characteristics should use more or less energy when compared to 'typical' buildings of similar types in the same climate zone. The targets in this report are based on averages of many existing buildings and energy models of prototype buildings, which are designed to represent 'typical' buildings and operating conditions. Handling the expected variations in energy use for building characteristics outside of building type and climate are outside of the scope of this report. Note that the target metric (EUI) normalizes for building size due to its units of kBtu/ft^2 per year.

Solar Availability

As these are pre-renewable performance targets, solar availability to reach zero energy is not considered. The ability for a building to reach zero energy performance within the building site is greatly dependent on its solar availability and floor area ratio.[9] The vast majority of existing zero energy buildings rely exclusively on solar PV to generate electricity on site. Depending on a particular building's roof or surrounding area to install a solar collection system, it may not be feasible to reach zero energy despite reaching the proposed energy targets from this report. In these cases, buildings will need to procure offsite renewable energy, including community solar, in order to offset their energy use.

Other Building Types

This report covers a limited set of building types. Energy code determination analyses have generated prototype building models, including offices, schools, retail, and others. Studies of the maximum technical potential of building performance commonly use those prototype models as a starting point. Those prototypes are therefore commonly featured in various studies that lead to multiple independent conclusions regarding the best possible performance achievable in these buildings types. Alongside modeling analyses, zero energy buildings with reported performance include, for the most part, offices, educational facilities, and assembly spaces. Many other building types have not been sufficiently modeled, metered (existing zero energy facilities), or studied to develop robust performance targets. Building types that are not explicitly included in this report may use a similar building type that is included, or use an average of several building types as a starting point for a design target.

9 Solar potential estimation tools are available to help evaluate how efficient a building needs to be in order to use less energy than what can be technically generated on site, such as NREL's PVWatts: https://pvwatts.nrel.gov/

Target Development

Sources

NBI has developed zero energy targets based on a combination of measured performance data—primarily from NBI's Getting to Zero Database—and modeling analyses published by a variety of sources, as outlined in Table 1 below. Many other benchmarking or target sources are available. Only those that aimed to either determine the maximum technical potential (i.e. best performance achievable with current technology) or study zero energy ready designs were included to help determine a realistic or feasible end-goal for energy efficiency given the current technological potential in the market. Other high performance resources are available (as opposed to zero energy), including energy targets for existing buildings, though they are outside of the scope of this report. The targets in this report are for zero energy new construction.

Figure 1 on the next page shows where the modeling analyses report the best possible performance for several building types. The variation between the results of these studies are due to differences in methodology and modeled equipment. These analyses were completed in different years and used the then current technology and efficiency levels in the market. New analyses performed with today's technology would likely show better performance than these analyses. We have averaged the performance levels from these analyses and combined them with measured data from existing buildings to set the performance target as detailed in the following section.

Table 1: Published energy modeling analyses and measured data sources informing the performance target development.

Title	Author	Description	Publication Year
NBI Getting to Zero Database[10]	NBI	Continuously updated repertoire of zero energy buildings in North America	-
Advanced Energy Design Guides[11]	Multiple	Detailed design guide for K-12 school and office buildings to achieve zero energy operation	2019
Built to Perform: An industry led pathway to a zero carbon ready building code[12]	Australian Sustainable Built Environment Council (ASBEC)	Australian study outlining a code pathway to zero energy and zero carbon buildings	2018
The City of Toronto Zero Emissions Buildings Framework[13]	Multiple	Study to identify feasible maximum performance targets for zero energy buildings in the city of Toronto to meet its climate goals	2017
Technical Feasibility Study for Zero Energy K-12 Schools[14]	National Renewable Energy Lab (NREL)	Maximum achievable energy performance study focused on schools	2016
Development of Maximum Technically Achievable Energy Targets for Commercial Buildings[15]	GARD Analytics	National study of best anticipated building performance using current (2015) best-practice design and operations strategies	2015
The Technical Feasibility of Zero Net Energy Buildings in California[16]	ARUP	Study of the best achievable building performance as a basis for zero energy code targets	2012

10 https://newbuildings.org/resource/getting-to-zero-database/

11 https://www.ashrae.org/technical-resources/aedgs

12 https://www.asbec.asn.au/research-items/built-perform/

13 https://www.toronto.ca/wp-content/uploads/2017/11/9875-Zero-Emissions-Buildings-Framework-Report.pdf

14 https://www.nrel.gov/docs/fy17osti/67233.pdf

15 http://www.gard.com/

16 https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=10721

Weighting the Sources

In combining the sources to establish an energy target for new zero energy buildings, NBI has prioritized measured data over modeled data. Projects from NBI's Getting to Zero Database demonstrate "real world" proof of the feasibility of operating to the recommended target levels. For this reason, measured data account for the majority (70%) of the overall input in determining the final target. The remaining input (30%) is based on the combination of relevant modeling analyses (some analyses are limited to certain building types). Figure 2 shows the comparison between modeling analysis and average existing zero energy building performance for several building types. For some building types, there are not sufficient data from existing zero energy buildings to determine an aggregate performance level. In these cases, targets are set to the average of high performance modeling analyses.

Figure 1: Summary of modeling analysis performance levels for select building types compared to ASHRAE 90.1-2016 standard performance (grey circles)

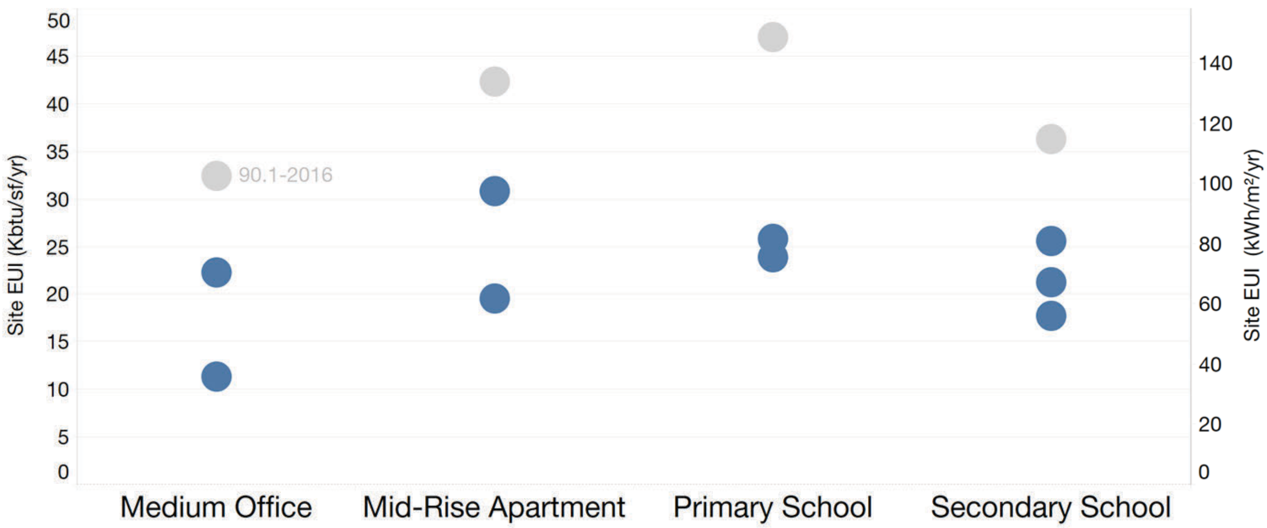
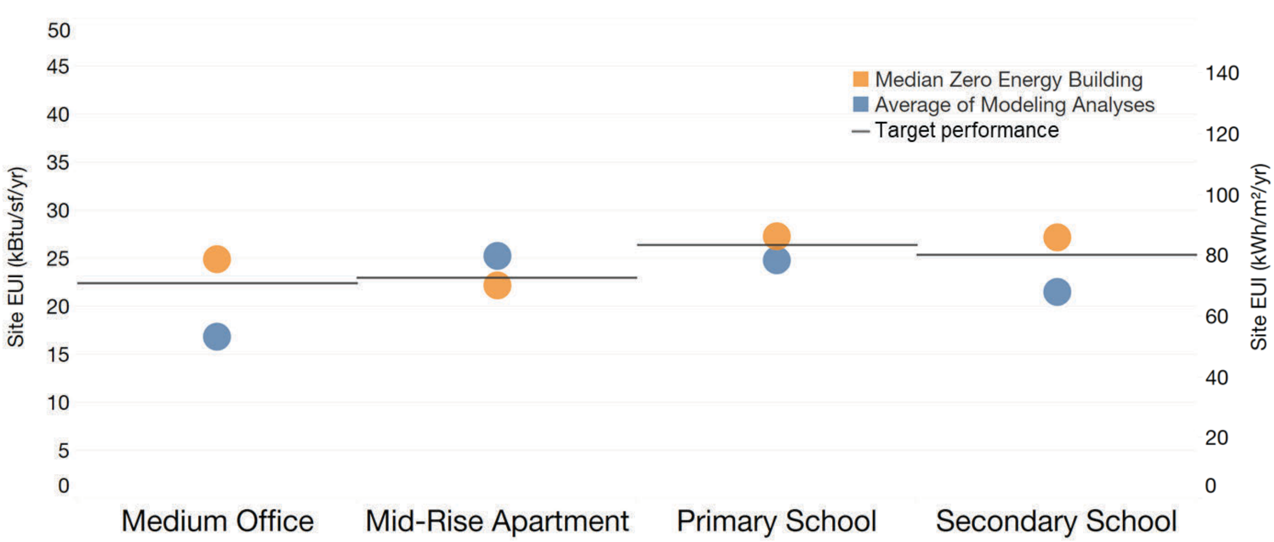


Figure 2: Target setting methodology showing the relative weights of existing building data and modeling analyses combining to set the target performance level



Climate Zone Adjustments

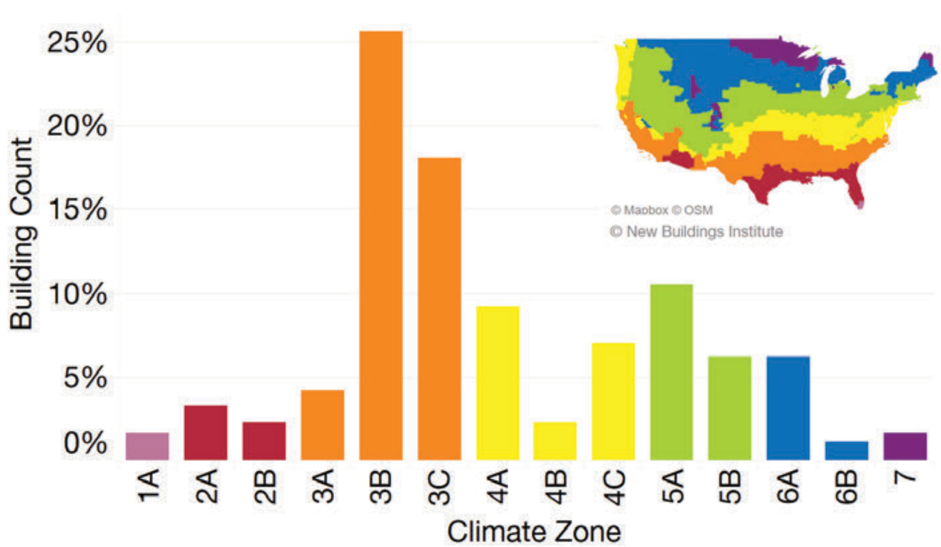
Modeling analyses estimate annual energy use intensity by building type and climate zone.[17] In order to compare studies that are limited to certain climate zones, climate zone adjustment factors are applied to "translate" the magnitude of energy use between specific climate zones and a national average. These adjustment factors are based on the relative energy use between various climate zones for various building types as modeled in the ASHRAE 90.1-2016 determination analysis performed by Pacific Northwest National Labs (PNNL).[18] Table 2 outlines the various climate zone adjustment factors relative to the national weighted average for an average building. These energy use factors highlight the impact of climate on expected building energy use, with ranges as high as 60% between the most and least demanding climates. Where available, factors for a matching building type are used; otherwise, the average for "All buildings" serves as the factor. The full table including factors for individual building types is included in the Appendix.

Measured data are available in every climate zone but because projects are not equally represented in all climate zones, these data are not representative of the national average climate. A disproportionate number of zero energy buildings are concentrated in climate zones 3B (25%) and 3C (18%). A visual representation of the diversity of climates in the zero energy building stock is shown in Figure 3. To allow for a more robust comparison of measured data, we first convert the measured energy use for each zero energy building to a national average equivalent using the climate zone adjustment factors (See Table 2 and Appendix). We then aggregate the energy data to represent the national average. Finally, we translate the aggregated measured data to climate zone equivalents from the common national average, once again using the climate zone adjustment factors.

Table 2: Energy use adjustment factors by climate zone relative to the national weighted average

Climate Zone	Energy Use Factor
National	1
1A	0.98
1B	1.01
2A	0.96
2B	0.98
3A	0.99
3B	0.92
3C	0.84
4A	1.00
4B	0.94
4C	0.95
5A	1.09
5B	1.00
5C	0.96
6A	1.11
6B	1.04
7	1.20
8	1.43

Figure 3: Climate zone breakdown of zero energy buildings tracked by New Buildings Institute



17 Climate zones used are per ASHRAE Standard 169-2013

18 90.1-2016 Determination Analysis: https://www.energycodes.gov/sites/default/files/documents/02202018_Standard_90.1-2016_Determination_TSD.pdf

Recommended Targets

Targets

The energy targets offered below in Table 3 are based on a mix of measured existing building data and modeling analyses as detailed in the previous section. Performance data for individual zero energy buildings are available in NBI getting to zero database.[19] Note that some building types that do not have sufficient existing zero energy level building data are still included in the table below when the energy modeling analyses show similar performance levels. In other words, the modeling analyses agree on what the performance potential is for these building types.

These targets reflect the performance of best-in-class buildings. The targets may be used as an initial goal for a building design, as an endpoint for energy policies to target over time, or as any number of other benchmarks. The targets may be exceeded, particularly over time as technology improvements enable lower-energy performance.

Cost-Effectiveness

The targets do not take into account the cost-effectiveness of designing buildings to these low-energy targets. Buildings performing at these target levels will certainly have significant energy cost savings when compared to average code buildings. The cost-effectiveness of additional insulation, high-efficiency HVAC equipment, higher quality construction, etc. will vary by region, market, economic needs, and many other factors. The cost-effectiveness of reaching these targets is therefore not easily generalizable and will require a case-by-case analysis from policy makers and building designers to determine whether the payback meets the project's or jurisdiction's goals.

Table 3: Zero energy performance targets for various building types and climate zones. Values are site energy use intensities (EUIs) [kBtu/sf/yr].[20]

Building Type	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Primary School	26	25	26	25	27	23	21	27	24	24	28	25	24	29	26	30	39
Low-Rise Apartment	20	21	19	20	21	19	17	21	20	20	24	21	20	24	23	27	31
Medium Office	24	24	23	23	23	21	17	22	20	20	24	21	20	25	23	22	27
Small Office	19	20	18	19	18	18	16	17	18	17	18	17	16	18	18	20	24
Secondary School	29	29	26	27	26	25	22	24	26	26	25	29	23	24	24	25	35
Public Assembly	27	28	27	27	28	26	24	28	26	26	30	28	27	31	29	34	40
Standalone Retail[21]	27	30	26	28	25	26	21	25	26	26	26	28	26	27	26	29	35
Mid-Rise Apartment	22	23	21	22	23	21	19	24	22	22	26	23	23	27	25	30	34
Strip Mall[21]	30	33	31	32	33	29	25	34	29	31	39	34	33	41	37	46	60
High-Rise Apartment[21]	28	28	27	27	28	26	22	29	27	27	33	29	27	33	30	37	43
Warehouse	5	8	6	8	7	7	7	9	8	8	11	9	9	11	10	15	16
Small Hotel[21]	36	35	35	35	35	34	32	36	34	34	38	35	34	39	37	41	47
Fire Station[22]	29	30	29	29	30	28	25	30	28	28	33	30	29	33	31	36	43

19 NBI getting to zero database: https://newbuildings.org/resource/getting-to-zero-database/

20 To convert to kWh/m²/yr, multiply these targets by 3.15

21 This building type does not have sufficient measured data. The targets are therefore based on modeling analyses only.

22 The target for fire stations is based on best-in-class case studies and limited measured data rather than modeling analyses

While cost data for zero energy and high performance buildings are sparse, some analyses suggest that zero energy buildings can be delivered for little to no price premium when compared to conventional buildings.[23, 24]

Barriers to Zero Energy in Codes

Traditionally, energy use beyond the scope of the energy code (i.e. "Unregulated loads") poses a challenge to requiring high performance in buildings. Unregulated loads include appliances, refrigeration equipment, plugged in devices, transportation systems, and other miscellaneous loads. These unregulated loads account for approximately one third of energy use in an average medium office built to a 90.1-2013 code level. For high performance buildings, the share of unregulated loads can be as high as 50% or more. The code may therefore be unable to reach these target levels via a traditional prescriptive pathway. In addition, federal preemption adds further limitations to the efficiency requirements codes may put in place on certain equipment, including appliances, rooftop air conditioners, water heaters, and other HVAC equipment.[25]

To reach these low-energy targets, codes must therefore pursue alternative pathways, including performance (i.e. modeling to a performance requirement) or outcome based (i.e. demonstrated metered performance in operation) approaches. Whole-building energy targets address all energy use in the building and offer policymakers a solution to address the unregulated load barrier in traditional codes. As an example, the city of Seattle energy code includes a performance pathway including energy use targets.[26] Other jurisdictions, including the city of Boulder, are pursuing an outcome-based pathway for code compliance based on whole-building energy use. In this outcome-based approach, individual buildings will be required to report on actual building performance and compare that performance to the energy modeling predictions, with increasing requirements over successive code cycles to perform within an acceptable tolerance relative to the predicted performance. With each code cycle, building performance will become more stringent, stepping down toward zero energy performance in line with those presented in this report. Whole-building outcome or performance approaches are effectively able to increase the scope of the code in order to address currently unregulated loads that may prevent buildings from reaching zero energy performance levels when not addressed.

Aside from the limitations of the energy code's scope in addressing energy use in the whole building, enforcing zero energy codes pose another challenge. Jurisdictions with energy performance requirements must consider potential enforcement options for buildings that do not report data and that do not perform to the levels set out in the code. These enforcement challenges may be overcome with retained funds from permitting that are held until a building demonstrates performance, or may be addressed with incentives for buildings that meet their required performance. Conversely, penalties may be an option for buildings that no not meet performance requirements. Robust guidelines that minimize manipulation of models and data reporting as a way to circumvent full compliance with code requirements are needed to ensure the goals of the energy code are realized. Modeling protocols, approved software, and

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23 https://gettingtozeroforum.org/dc-cost-study-finds-over-30-roi-for-zne/

24 https://newbuildings.org/code_policy/model-energy-green-codes/costs-of-advanced-efficiency-measures-in-commercial-buildings/

25 For more information on federal preemption as a barrier to energy codes, see NBI's white paper on the topic here: https://newbuildings.org/wp-content/uploads/2017/06/NBI_FederalPreemptionAsaBarrier.pdf

26 http://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)/energy-code

energy accounting methodologies that clarify which loads are included and excluded from the code will help guide owners and designers toward successful code compliance and ultimately, energy and carbon savings in their buildings at scale.

The goal of these energy targets in the context of energy policy is to empower policy makers to enact policy to reach new levels of energy performance not currently achievable under the standard model codes as they are currently structured. Cities with bold climate, energy, and carbon goals will struggle to meet those goals with model energy codes and must therefore explore alternative pathways to reach these energy, carbon, and cost savings by way of alternative compliance or outcome-based approaches.

Conclusion

This report presents energy performance targets that represent where zero energy buildings are currently designed and operating in the market. The measured data from these buildings as leveraged from NBI's internal tracking are supplemented with modeling analyses to determine feasible, zero energy level performance goals. These targets will support two primary audiences, designers and policymakers. Designers (and owners) are encouraged to use these targets to guide project decisions and have a starting point for zero energy building design. Owners may also use these targets in project requirements. Policymakers can implement these targets in energy policy as an end goal as part of a roadmap to zero energy performance at scale. Policymakers may use these targets in whole building performance or outcome based code compliance pathways. These energy targets can serve the market in other ways, including the formation of incentive programs, informing other research, and signaling to the market where energy performance for commercial buildings can go.

Appendix

Climate zone adjustment factors—these factors are used to translate energy use intensity from one climate zone to another, or to the national average. The factors are based on the determination analysis of the 90.1-2016 commercial energy code.[27]

Table 4: Climate zone adjustment factors for climate zones 1 through 4

Building Type	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C
Clinic	1.09	1.04	1.05	1.00	1.04	0.93	0.86	0.99	0.92	0.90
Fast Food	0.84	0.87	0.90	0.88	0.97	0.89	0.91	1.02	0.93	0.99
High-rise Apartment	0.98	1.00	0.93	0.97	1.00	0.90	0.77	1.03	0.95	0.95
Hospital	1.01	0.95	1.00	0.94	1.01	0.93	0.88	1.01	0.91	0.93
Large Hotel	1.08	1.07	1.04	1.00	1.04	0.94	0.87	0.99	0.94	0.93
Large Office	1.04	1.03	0.99	1.01	1.00	0.97	0.84	1.00	0.98	0.90
Medium Office	1.06	1.07	1.00	1.03	1.01	0.92	0.78	0.99	0.91	0.89
Mid-rise Apartment	0.95	1.00	0.92	0.96	0.98	0.91	0.81	1.02	0.96	0.96
Primary School	0.99	0.96	0.99	0.95	1.02	0.87	0.81	1.02	0.89	0.92
Restaurant	0.85	0.89	0.89	0.89	0.95	0.89	0.87	1.01	0.92	0.99
Standalone Retail	1.03	1.14	1.00	1.09	0.98	1.01	0.82	0.96	1.01	0.99
Secondary School	1.12	1.13	1.03	1.08	1.01	0.99	0.86	0.96	1.02	1.04
Small Hotel	0.99	0.96	0.97	0.96	0.98	0.94	0.89	1.00	0.95	0.95
Small Office	1.06	1.09	1.02	1.06	1.01	1.00	0.88	0.97	0.98	0.93
Strip Mall	0.90	0.98	0.93	0.96	0.97	0.87	0.75	1.02	0.87	0.93
Warehouse	0.66	0.98	0.75	0.92	0.90	0.81	0.87	1.05	0.92	0.99
Office	1.05	1.06	1.00	1.03	1.01	0.96	0.83	0.99	0.95	0.91
All Buildings	0.98	1.01	0.96	0.98	0.99	0.92	0.84	1.00	0.94	0.95

Table 5: Climate zone adjustment factors for climate zones 5 through 8

Building Type	5A	5B	5C	6A	6B	7	8	National
Clinic	1.01	0.93	0.89	1.01	0.96	1.05	1.22	1
Fast Food	1.12	1.03	1.02	1.18	1.13	1.30	1.58	1
High-rise Apartment	1.15	1.01	0.97	1.17	1.07	1.31	1.50	1
Hospital	1.03	0.96	0.94	1.04	0.98	1.07	1.18	1
Large Hotel	1.03	0.96	0.93	1.03	0.99	1.07	1.29	1
Large Office	1.06	0.98	0.90	1.07	1.05	1.12	1.25	1
Medium Office	1.09	0.94	0.89	1.10	1.01	0.99	1.22	1
Mid-rise Apartment	1.13	1.01	0.98	1.16	1.08	1.28	1.49	1
Primary School	1.06	0.95	0.91	1.08	1.00	1.14	1.47	1

table continued on next page

27 Determination analysis available here: https://www.energycodes.gov/sites/default/files/documents/02202018_Standard_90.1-2016_Determination_TSD.pdf

Building Type	5A	5B	5C	6A	6B	7	8	National
Restaurant	1.12	1.02	1.02	1.19	1.12	1.32	1.62	1
Standalone Retail	1.01	1.09	1.01	1.02	0.99	1.10	1.37	1
Secondary School	0.98	1.12	0.92	0.96	0.92	1.00	1.36	1
Small Hotel	1.05	0.98	0.96	1.08	1.03	1.15	1.30	1
Small Office	1.00	0.96	0.92	1.01	0.99	1.09	1.35	1
Strip Mall	1.17	1.00	0.99	1.23	1.11	1.38	1.79	1
Warehouse	1.33	1.05	1.07	1.40	1.21	1.89	1.89	1
Office	1.05	0.96	0.90	1.06	1.02	1.07	1.27	1
All Buildings	1.09	1.00	0.96	1.11	1.04	1.20	1.43	1

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