

OurEnergyPolicy

Decarbonizing Mass Market Buildings

Outcomes from an OurEnergyPolicy Discussion Series

March 2022







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An OurEnergyPolicy Discussion Series

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Foreword from OurEnergyPolicy

The mission of OurEnergyPolicy (OEP), a non-partisan organization, is to facilitate substantive, responsible dialogue on energy policy issues and provide this dialogue as a resource for the American people, policymakers, and the media. In doing so, we inform and support the creation of sound and effective policies. OEP seeks to encourage dialogue representative of viewpoints from across the energy sector, rather than advocating for any specific political, programmatic, policy, or technological agenda. As part of this mission, OEP introduced our roundtable initiative, a part of our larger Energy Leaders Event Series. These closed events engage 10–12 industry experts in several conversations examining a specific challenge facing the energy sector. Following each roundtable, OEP and the participating experts work together to create a summary of the conversation which captures their thoughts on the issue, areas of agreement and disagreement, recommendations for solutions, and other relevant insights.

In conjunction with <u>The Clean Fight New York</u>, a not-for-profit climate tech accelerator supported by NYSERDA and the Department of Energy, OurEnergyPolicy hosted two conversations examining the challenge of decarbonizing class B and C buildings, also referred to as non-luxury residential and commercial properties. Both conversations were structured to include experts from across the political spectrum and to include energy leaders with extensive experience in government, non-profit organizations, academia, real estate, law, innovation and energy efficiency services. We are grateful to our participants for their involvement. We would also like to highlight the involvement of the J.M. Kaplan Fund, the generous support of which has made OEP's 2021 roundtables possible. The opinions expressed here do not necessarily reflect the views of the J.M. Kaplan Fund, The Clean Fight New York, or the individual participants listed. The discussion represented within this paper does not express the position of OEP, which, as a non-partisan organization, does not advocate for any particular policy, solution, or approach.



Executive Summary

The roundtable discussions that resulted in this whitepaper were organized to examine the challenges of decarbonizing class B/C buildings and how to identify effective solutions. Class B/C buildings, also known as non-luxury residential and commercial buildings, are typically older properties, often in underserved communities and generally in need of updates or renovations. These properties have proven to be difficult to decarbonize due to incentive, information and resource constraints; a particular challenge since they generate the majority of the real estate sector's carbon emissions. In order to have a robust conversation including key stakeholder opinions, our roundtable discussions featured experts within federal and municipal government, nonprofits specializing in electrification and energy efficiency programs, academia, building owners, and market transformation organizations.

Participants identified seven "leading" challenges facing the sector: market fragmentation; the difficulty of structural market transformation; split incentives; workforce education and training; demand side interest; the lack of harmonization between thermal energy, thermal efficiency, policy, and pricing; and the cost of capital. In order to ensure quality and depth of conversation, the most important of the challenges, as determined by the participants, were discussed in the greatest detail. Those highest priorities were market fragmentation; the difficulty of structural market transformation; split incentives; and workforce education and training. As a result of the discussion and expert insights, this document highlights a four-pronged approach to decarbonizing mass-market buildings, including potential solutions:

1) Act with urgency3) Prepare and enable the workforce2) Force market demand4) Make adoption enormously easy

The need to *act with urgency*, was born from the acknowledgement that government and industry are not acting as if this is a crisis. Participants felt that until we have agreed upon level of urgency, it is difficult for a strategic roadmap to be built and cascading decisions to be made and prioritized, leading to a fatal slowing of progress. Secondly, unless cohesive measures are put in place to *force market demand*, that demand will not create itself with the required urgency. There was general agreement that structural change to the market would require a top-down approach from government, enacting strong, universal policies, regulations, incentives, permits and tariffs that would 1) unlock a flood of private capital into the market due to clear signaling, and 2) make it easier for companies to scale across markets. Preparing and enabling the workforce is critical to ensuring that those working in the buildings industry are primed to help with the transition to net-zero buildings. 1) Educating decision makers and influencers as to the key pathways to decarbonization, and 2) ensuring there is a robust and well-trained pipeline of workers to execute on projects once demand has been created. And lastly, making adoption enormously easy, as the current situation is incredibly confusing, leaving buyers who are interested in retrofitting their buildings without clear, reliable, easy to navigate and cost-effective paths to decarbonization. Although this is a complex topic with many potential approaches, four key elements emerged, 1) Simple frameworks to make it easier to get started, 2) Packaging of solutions to make purchasing easier, 3) Capital solutions to make purchasing affordable, and 3) Solutions to give buyers confidence in their purchases.



Participants agreed that this should be an ongoing dialogue within the sector, and acknowledged that more conversation is needed on this issue to identify potential solutions. This whitepaper is intended to serve as a primer on the issue as well as present suggested solutions from leaders in the sector. It is our goal that the information and viewpoints in this paper help guide further research and legislative action to address decarbonizing class B/C buildings.



Table of Contents

Forev	2	
Intro	6	
A Str	ategic Approach	7
1.	Act with urgency	7
2.	Force market demand	8
3.	Prepare and Enable the Workforce	9
4.	Make Adoption Enormously Easy	10
Key Takeaways / Conclusion		13



Introduction

Mass market buildings, defined in this paper as class B/C or non-luxury residential and commercial properties, account for a large percentage of the United States' annual energy use and greenhouse gas emissions. Buildings are responsible for roughly <u>40% of total U.S. energy consumption</u> per year, as well as almost <u>40% of total U.S. greenhouse gas emissions</u>. Basic upgrades to properties have the potential to meaningfully reduce operating costs and reduce their carbon intensity. <u>It is estimated</u> that basic improvements could generate savings of 15% on energy costs alone, with larger investments representing savings of up to roughly 35%. Though the total number and exact definition varies from region to region, class B/C buildings represent a significant portion of the real estate market. In Manhattan, for example, they account for roughly <u>34%</u> of commercial properties.

Despite the apparent benefits of retrofitting and electrifying these buildings, this segment of the real estate market has struggled to make progress in decarbonizing relative to luxury, class A properties due to lack of incentives and resources to navigate a difficult market. In conjunction with The Clean Fight New York, OurEnergyPolicy convened two roundtable discussions on August 25 and September 27, 2021, with the goal of identifying the key challenges and factors responsible for the disparity between these two closely linked market segments, and gathering expert opinions and suggestions for potential solutions

The first session on August 25, 2021, focused on creating the list of challenges that participants found to be the most critical and important to increasing energy efficiency and decarbonizing the building sector. These included: Market Fragmentation, Structural Market Transformation, Split Incentives, Workforce Education and Training, Demand Side Interest, Lack of Harmonization Between Efficiency, Policy, and Pricing, and Cost of Capital.

Each of the challenges named by participants were debated briefly by the group and ordered in terms of overall importance. The second session on September 27, 2021, focused on the solutions to the challenges listed in the first session. In order to ensure sufficient examination of the most significant challenges mentioned, discussion was focused primarily on the four that received the highest number of votes from the group: Market Fragmentation, Difficulty of Structural Market Transformation, Split Incentives, and Workforce Education and Training. The three remaining challenges received a lower level of discussion regarding potential solutions, but certainly warrant further consideration.

The following takes the insights, opinions and thoughts from the expert participants and summarizes a four-pronged approach to decarbonizing mass market buildings and the associated solutions.



A Strategic Approach

As stated above, over the course of the first session, participants debated and compiled a list of eight significant challenges facing the non-luxury commercial and residential real estate sector. During this conversation, participants were asked to cast three votes each for the concepts/challenges they viewed as most critical to effecting significant reduction in energy use and greenhouse gas emissions within the building sector. The discussion then focused on how best to address these key issues in order to achieve decarbonization at speed and scale. As a result of the insights from the discussion, the following is a summary of a high-level strategic approach and potential solutions to achieve these goals.

The themes of the discussion led to a four-prong approach necessary to achieve significant decarbonization:

- 1) Act with urgency
- 2) Force market demand

- 3) Prepare and enable the workforce
- 4) Make adoption enormously easy

1. Act with urgency

There was consensus among the group that there is no agreement within government and industry regarding the degree to which this is a crisis. Although there is growing interest in the space, there is nowhere near the level of urgency needed. As a result, a clear and consolidated strategy and roadmap

has not been created, without which, a piecemeal approach to decarbonizing buildings has unfolded that will fail to scale at the necessary speed. As one participant noted: "The industry should agree on the level of urgency – are we treating climate change as a crisis or not? If so, then industry goals should reflect this urgency." Some referred to the need for a "wartime footing" to align the goals of key players and make meaningful progress towards decarbonization. "If the goal is to decarbonize buildings,

"The industry should agree on the level of urgency – are we treating climate change as a crisis or not? If so, then industry goals should reflect this urgency."

that one priority must supersede everything. Every decision should be through the lens of 'will this help us win the war''' to avoid other priorities steering the strategy. It was felt that until we have an agreed upon priority and agreed level of urgency, it is very hard for cascading decisions to be made and prioritized, leading to a fatal slowing of progress. In addition to encouraging a shared view of the level of urgency sector-wide, "clarity of messaging and specificity" was also discussed as a necessity for the ongoing dialogue within the sector. These issues can be murky at best, and shared language with clear points are needed for meaningful progress towards decarbonization. Although there were differing opinions on how to best achieve change (which are discussed below), there was consensus that until a more unified strategy was created, there was little chance of achieving the goal of building decarbonization in the timeframe required.



2. Force market demand

There is not currently substantial market demand for building decarbonization. Participants suggested that major drivers of this are: lack of knowledge within the sector regarding available options, capital constraints, fear of predatory business practices by service providers, tenant disruption, and an overall industry-wide "inertia" whereby older technology is repaired or replaced with a newer version rather than a different, more efficient piece of technology. Participants felt that unless cohesive measures are put into place to truly create market demand, that demand will not create itself with the required urgency. There was general agreement that the most effective way to drive structural change for the majority of the market at the required speed would be a top-down approach from government, enacting strong, universal policies, regulations, incentives, permits and tariffs that would 1) unlock a flood of private capital into the market due to clear signaling, and 2) make it easier for companies to scale across markets.

Structural change to the market will require embedding incentives within the structure through legislation rather than addressing issues on a one-by-one basis. Some felt the need for a wartime footing, while others advocated for more targeted regulations that can help shift the structure of the market. All agreed "the perfect cannot be the enemy of the good" and that stakeholders from all points of view must be willing to compromise in order to promote broad impact in the sector. New York City's Local Law 97, which institutes emission and efficiency regulations on buildings of a certain size, was cited as an example of a

"Even if equipment was given at zero Capex, if it drives up Opex because of fuel costs, it's an economic non-starter". piece of legislation that could help shift the market if implemented more widely across the country. Building performance policies of this nature have strong potential to move the market, according to the roundtable participants. A more direct approach was taken recently in Ithaca, New York, where the <u>city voted</u> to fully decarbonize and electrify buildings in the city by 2030. Other policies suggested during conversation include requiring all buildings to be brought up to code when

sold, for buildings that don't trigger codes instituting building performance standards based on carbon scores, prohibiting the use of less efficient technologies in regions where more efficient technology makes economic sense, and implementing moratoriums on natural gas for new construction. The last suggestion was implemented in Westchester, NY, and referenced as one of the most effective policies in the region in terms of decarbonization for new buildings. The same approach was recently voted through in New York City, where a natural gas moratorium will apply to all new construction by 2027. These types of initiatives would both force owners to act due to compliance, and provide strong signals to investors as to where monies need to flow.

The participants also discussed the market barrier to decarbonization in the context of the relative price of carbon, namely that it is often economically unfeasible to electrify when gas prices are cheaper than electricity. "Even if equipment was given at zero Capex, if it drives up Opex because of fuel costs, it's an economic non-starter". Although others provided data that for the majority of buildings, electrification will save money, there was discussion of the need to rationalize the cost of carbon across the board, so



the economics of decarbonization can work for all building owners. Participants did specify that a carbon tax would have to be significant in order to justify capital expenditures on certain efficiency upgrades.

The sentiment in the group was that with measures such as those outlined above, "capital will follow because of clear, stable guidelines in place." Setting mandatory standards sends a clear signal within the sector and helps direct investment. In addition, as one participant put it, once we are able to convince owners and operators that there is a fast-approaching expiration date on less efficient technologies and

"Capital will follow because of clear, stable guidelines in place."

carbon-intensive fuels, the switch into cleaner, more efficient technologies will follow rapidly.

It was also noted that the current piecemeal approach to codes, regulations and incentives made it incredibly hard for solutions providers to scale across the US. A business case that works in one city or market would have to be retooled to make sense even in another city in the same state. Instituting stronger federal guidance and regulations, specifically, the standardization of permits and tariffs on a national or regional basis would allow for more "rinse and repeat" style upgrades and allow larger organizations to complete upgrades more cost-effectively. California, for example, passed a <u>state law</u> mandating that all jurisdictions adopt standardized, streamlined solar permitting. Greater standardization is key to enabling companies to scale with the efficiency and speed required.

3. Prepare and Enable the Workforce

Two key issues were identified with regard to ensuring that those working in the buildings industry are primed to help with the transition to net-zero buildings. 1) Educating decision makers and influencers as to the key pathways to decarbonization, and 2) Ensuring there is a robust and well-trained pipeline of workers to execute on projects once demand has been created.

Participants discussed the need for an initiative within the industry to increase sector knowledge. The different levels of understanding between operators, designers, MEPs, financial institutions, owners, inspectors, and others can often disincentivize upgrades, lead to them being done incorrectly, or lead to owners being taken advantage of, all of which are detrimental to larger decarbonization efforts. It was felt that MEPs were a particularly important group to get on board, as they are frequently a key influencer in the retrofit process. According to panelists, these types of programs are critical to progress in the sector but receive very little interest or funding as a result of being "soft programs" that are difficult to attribute specific dollar amounts of savings to. Supporting sector wide "soft programs" of this nature, in conjunction with reasonable top-down regulations, would help address many of the challenges facing this fragmented sector.



It was agreed that workforce development and training is a leading issue in the industry. There is a large need for an influx of new workers "at the top of the pipeline." Participants stated that this is an area that the government could directly influence by supporting and incentivizing the entry of recent high school graduates, for example, into training programs and related career paths. As stated during the conversation

"We've got to start building the pipeline for ten years from now, today."

- "We've got to start building the pipeline for ten years from now, today." Supporting retrofit programs similar to a civilian climate corps, as suggested in the Green New Deal, are another way for the government to fill the gap between the available and needed workforce. State government agencies could also play a part by instituting scale programs and

aggressively working to hire for positions such as building inspectors. It was felt by some that re-training programs and incentives shouldn't be positioned around 'green jobs' but rather as a way to increase skills and offerings, in order to avoid politicization and get a broader stakeholder base on board. Participants mentioned that many contractors do not use workforce programs because they are not flexible enough timewise, or they do not actually provide the skills they are meant to. Like many of the challenges discussed, participants agreed that this is a larger structural issue within the sector. Private industry will also have to play a role in developing the workforce, and some felt this would be a faster and more effective approach, particularly if there are clear policy signals. Since there is more demand than supply for skilled labor, private companies must institute their own training programs. Cooperation between government and private industry could help distribute the cost of these training programs while optimizing the efficiency since companies, in order to support their bottom line, would have a greater incentive to ensure the overall quality of education.

Programs like workforce training and development can help attract and educate new workers in a variety of positions. According to one participant, the challenge lies with combining these programs with existing human resources and hiring practices in order to find potential employees that otherwise wouldn't be drawn to a career in clean technology solutions. Supporting union programs and approaching the workforce issue from different angles, such as a social justice viewpoint, can all open up new pools of potential workers. It was felt to be very important that workforce development programs are thoughtfully designed to benefit underserved communities, who often are excluded from such programs. In order to solve this, and other challenges in the industry, a holistic approach is needed.

4. Make Adoption Enormously Easy

The last pillar discussed to speed the path to decarbonization is to make adoption of solutions significantly easier for people to enact. The current situation is incredibly confusing, leaving buyers who are interested in retrofitting their buildings without clear, reliable, easy to navigate, and cost-effective paths to decarbonization. This topic was the subject of a large amount of the discussion among participants. Although this is a complex topic with many potential approaches, four key elements emerged:



- 1. Simple frameworks to make it easier to get started
- 2. Packaging of solutions to make purchasing easier
- 3. Capital solutions to make purchasing affordable
- 4. Solutions to give buyers confidence in their purchases

Even if a building owner has a desire or sufficient incentives to decarbonize their building, it is not a simple process to do so, and many owners do not know where to start in their planning process. The importance of re-educating key influencers in the industry was discussed above. However, participants also discussed the critical need to provide decision makers with clear and simple frameworks to better understand the process they would be embarking upon. On such example is Rewiring America's 'Electrify Everything in Your Home,' a layman's guide for homeowners, which lays out the options for electrifying home appliances, how to get started, and the questions to ask your contractors. A more technical example targeting mass market buildings is the work being done by the Empire Building Challenge, which helps building owners to work through an incremental and integrated design process combined with strategic capital planning, in order to electrify their buildings in a timely yet feasible manner.

One of the key issues discussed impacting ease of adoption was market fragmentation. Currently, key segments of the real estate sector (Design, Engineering, Construction, Operations, Service Providers) all function independently of one another. The navigation and coordination of decarbonization efforts is exceptionally difficult as each of these segments has different priorities, goals, and incentives. Participants agreed that these separate, and often conflicting, market perspectives make it very unlikely that the industry could deliver decarbonization at the necessary scale, scope, and speed. Furthermore, these disparate and conflicting viewpoints make it incredibly difficult for buyers to effectively navigate the market. Participants in favor of consolidation contrasted the real estate industry with other industries such as automotive or aerospace manufacturing – "Can you imagine buying your different car parts at different places, hiring someone else to build it, someone different to maintain it, etc.? Far fewer people would buy cars just due to the hassle." This "fractured" business model in the building industry increases costs and delays production. Some participants believed a smaller number of consolidated building service companies would allow for aligned incentives leading to more extensive, rapid, and cost-effective efficiency improvement projects. Others felt that less drastic consolidation was needed, but that solutions needed to be packaged or bundled to make it easier for buyers to purchase while also making sales and delivery more efficient for solutions providers. Examples ranged from companies such as Sealed, that bundles heating, cooling and energy efficiency upgrades with performance financing; to replicating and expanding programs in the United States such as Europe's Energiesprong initiative that brings buildings to net-zero through consolidated solutions that can be installed in 1-10 days, with limited tenant disruption and long term warranties.

A key challenge, and constant underlying theme in the conversation, was the high cost of capital. The current cost is prohibitive in many cases and disincentivizes efficiency upgrades. Participants discussed various options for addressing this issue including government subsidies, low-interest loans, built-in financing and rebates. Examples of capital innovations included the approach used by the City of Ithaca,



which raised \$100M in private capital in order to quickly provide low-to-no interest loans for building decarbonization or an increasing number of climate-tech companies such as BlocPower that are building financing solutions into their offerings, providing no upfront costs, guaranteed savings and on-bill financing. There was also discussion of using financing programs to incentivize action, such as mandating Commercial Property-Assessed Clean Energy (C-PACE) programs and analogs for the utility industry that would allow upgrades to be capitalized rather than expensed, incentivizing investment. Also requiring banks to have specialized energy efficiency expertise and technical knowledge would help with capital issues, as it would help streamline the financing process. Participants agreed that creating a strategy to reduce the cost of capital is imperative, especially in terms of up-front costs for electrifying and retrofitting.

The final area discussed, with regard to making adoption easier, concerned giving buyers more confidence in their purchases. Because many climate technologies are new (or feel new to the market) there is a concern about being an early adopter, or a desire to wait until the next generation of technology emerges. Consumers have been taken advantage of within the retrofit market, as there aren't enough certifications and controls preventing predatory business practices. This in turn dissuades consumers, both commercial and residential, from investing in energy efficiency upgrades and hinders large-scale decarbonization efforts. Further complicating this issue is that efficiency solutions in more temperate climates are not always well suited to other, colder, regions. These regional differences require a more tailored approach from efficiency service providers, which in turn requires stronger management of the industry. A participant pointed out that specific codes and ratings have been effectively used in the past to give consumers greater confidence in the retrofit market, the contracting practices from the U.S. Department of Energy's Federal Energy Management Program, for example. In addition, there was discussion about the need for long-term warranties or insurance innovations that would provide buyers with much-needed reassurance that they will be protected if the capital-intensive investment they are making runs into problems. If the market is going to be forced to act, as is necessary, in return there must be more measures to protect consumers.



Key Takeaways / Conclusion

This whitepaper is best used as a guide for further research and as a primer for legislators and policymakers. The information presented here is intended to be a succinct summary of the views of industry leaders and experts in the field of building decarbonization. While the individual participants often differed in their views of the challenges, they were frequently able to agree on where many of the "levers" exist that may be used to effect real change within the industry. As stated previously, many of these solutions can best be defined as top-down regulatory approaches, while others would rely more on market-based approaches supported by consistent, clear, and fair policy. Participants agreed that solving these challenges will require a mixed approach with both market-based and command-and-control measures playing a role.

Additional research is needed to help achieve meaningful action and, according to one participant, the area most in need of further examination are the driving incentives behind consumer behavior. Behavioral economic studies and research that can accurately explain consumer actions and how to motivate greater adoption of retrofit solutions will be required to address the issue at the necessary scale.

A sector as fragmented as real estate means there is no single solution to decarbonizing the sector, but there are numerous options that could greatly decrease emissions from class B/C buildings, and that can be served up to the market in ways that are easier to understand. There are additional solutions, and more research is needed on many of these issues, but the suggestions resulting from these dialogues offer a sound starting point. Decarbonizing a sector of the economy responsible for roughly 40% of the country's greenhouse gas emissions is of critical importance if the United States is to meet decarbonization goals and make a meaningful contribution to the global effort to combat climate change.

