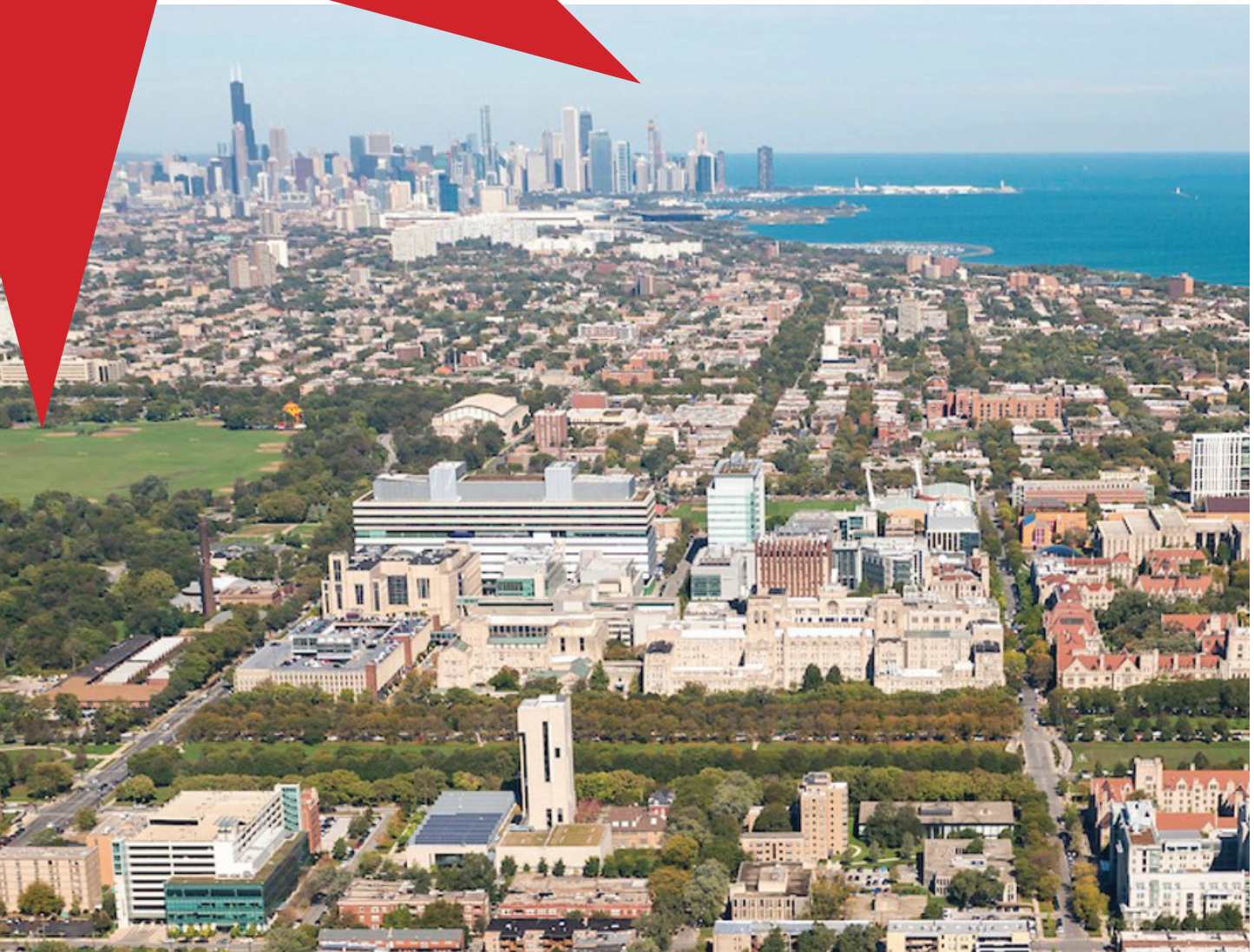




Developing an Equitable Building Decarbonization Strategy for Chicago:

Recommendations Report of the Chicago
Building Decarbonization Policy Working Group





Letter from
THE MAYOR

Dear Friends:

On Earth Day 2021, during the height of the COVID-19 pandemic, my administration announced a bold plan for a Green Recovery, proposing several strategies to fight the climate crisis and build a stronger, more equitable, Chicago as we recover from an unprecedented public health emergency. My administration, as part of the Green Recovery agenda, sought to develop a building emissions strategy to help achieve a 62% reduction in citywide emissions by 2040, lowering the economic burdens of residents and businesses through energy efficiency, electrification, renewable energy, and innovation in new construction. To plan for the decarbonization of Chicago's buildings and generate equitable co-benefits for all Chicagoans, my administration brought a cross-section of groups to the table, ranging from civic leaders to technical professionals. Co-led by the City's partners at Elevate and with support from the NRDC, Delivery Associates, and Bloomberg Philanthropies' American Cities Climate Challenge, the Chicago Building Decarbonization Working Group (CBDWG) was formed to build consensus around realistic, effective, and meaningful strategies. These 53 partners worked tirelessly alongside my administration's Sustainability Team to create recommendations that will pave the way for meaningful climate action. I am proud to announce that, one year later, we have delivered on our promise by generating a set of 26 building efficiency recommendations that advance Chicago's ambitious climate goals.

The following report reminds us that equity-driven and inclusive processes yield the greatest results. Over the past year, the City of Chicago's Chief Sustainability Officer, Angela Tovar, led the CBDWG to address a key climate action question: how do we justly and efficiently reduce building emissions in Chicago? With the knowledge that nearly 70% of all emissions stem from buildings and their energy use, the City and its partners spent almost a year to carefully research and craft the recommendations you'll find in this report.

Improving Chicago's buildings is the foundation for reducing energy use and cutting greenhouse gas emissions; saving building operators, businesses, and residents money on their utility bills; and boosting our local



economy by creating and supporting green jobs. These co-benefits directly align with two components of my commitment to eliminating poverty in Chicago: reducing expenses for Chicagoans and expanding quality wealth-building opportunities. As we move toward policy implementation, we must reinforce the importance of equitable decarbonization, and to keep in mind that the climate crisis disproportionately affects low-income communities and people of color. The punishing combination of rising temperatures and precipitation, punctuated by extreme storms and flooding, increases risks for vulnerable communities. In a moment defined by a respiratory pandemic, we need to consider the continuing threat that fossil fuel emissions pose to chronically overburdened communities. While these impacts affect us all, the ability to navigate these challenges is far more difficult in underserved communities that may lack the necessary resources to react quickly and nimbly. As much as climate is an environmental issue, it is also a social and economic justice issue. Chicago will continue to lead in this fight against climate change in collaboration with our community partners.

I am proud to share this culmination of a year's worth of community led research and policy development with the public, illustrating our path forward and setting the standard for inclusive city-community partnerships. My administration will utilize \$188,000,000 worth of funding in the Chicago Recovery Plan to serve as a down payment on equitable decarbonization, and our 2022 Climate Action Plan will guide our broader strategy for the years to come. With support from my administration, City Council, and partnerships across Chicago, we will continue our march toward a brighter, cleaner, more just future for all.



Letter from
**CHIEF SUSTAINABILITY
OFFICER**

Dear Chicagoans,

On behalf of the Chicago Building Decarbonization Working Group (CBDWG), it is with tremendous pride that I share the Chicago Building Decarbonization Strategy Report. This document is the result of over a year-long effort to bring together a diverse set of subject matter experts across all sectors to identify policies and actions to equitably address the largest source of emissions in the City of Chicago: our built environment. Currently, buildings account for 70% of Chicago's greenhouse gas emissions and we must take all actions to reduce energy consumption in buildings to meet our long-term climate goals. The process to develop this strategy is a first-class demonstration of partnership between government, technical experts, advocates, community, and business leaders to design meaningful climate mitigation policies. These policies simultaneously address systemic issues that lead to disparate conditions in our built environment, like redlining and broader discriminatory practices in housing, which have created barriers to participation for both those lacking resources to decarbonize their homes as well as those who have been historically left-out of the decision-making process.

We in the City of Chicago are guided by our recently released 2022 Climate Action Plan (CAP) that identifies goals and targets to mitigate the climate crisis while driving equitable co-benefits that our communities deserve, including cleaner air, good green jobs, economic security, resilient neighborhoods and access to clean energy infrastructure. The 2022 CAP identifies an interim target of a 62% reduction in our greenhouse gas emissions by 2040 and outlines a commitment to

ensure that communities who have been harmed by environmental injustices and communities who are disproportionately impacted by climate change will benefit first and foremost from climate action. The decarbonization strategy proposed by the CBDWG meets the goals of the CAP by proposing a suite of policies that carry this mission forward.



We are facing an unprecedented moment in the history of our City as the convergence of multiple threats has, over the last two years, threatened the health and safety of our communities, particularly those most vulnerable to climate change. The COVID-19 pandemic, the exposure of deep and systemic racism, and the compounding impacts of the climate crisis have underscored the importance of advancing policies that prioritize our residents, our communities, and our livelihoods. The City of Chicago is excited to co-lead an effort to equitably retrofit our existing building stock and to develop new policies to support clean building for new construction. These policies will maximize high-efficiency technologies and energy efficiency measures, eliminate our reliance on harmful fossil fuels, support the local green job workforce, and create healthy buildings so that every resident can live, work and thrive.

In partnership,

Angela Tovar

Chief Sustainability Officer
City of Chicago



Contents

Letter from the Mayor	2
Letter from Chief Sustainability Officer	3
Executive Summary	6
Introduction	12
Existing Efforts	12
Upcoming Efforts and Opportunities	15
Challenges	17
Process+Project Descriptions	19
Project Team	19
Project Phases	19
In-depth Interviews	21
Recommendations from the Chicago Building Decarbonization Policy Working Group.	23
Recommendations Section 1: Leverage known pathways to achieve net carbon neutrality in all new buildings.	23
Recommendations Section 2: Help building owners navigate pathways to improving building energy use and performance.	30
Recommendations Section 3: Build, develop and support the social, financial and technical resources that result in a self-sustaining clean energy economy	34
Recommendations Section 4: Fund and prioritize equitable community engagement that cultivates resilient partnerships and advances hyperlocal benefits.	41
Next Steps and Strategic Process	45
Appendix 1: Acknowledgements	47
Appendix 2: Acronyms and Definitions	49
Appendix 3: Summary of Research Findings	51
Appendix 4: Stakeholder Engagement Key Takeaways	56

Executive Summary

Mayor Lori Lightfoot created the Chicago Building Decarbonization Working Group (referred to in the report as “the Working Group”) in June 2021 to recommend equitable solutions to address the nearly 70% of emissions that come from buildings in Chicago¹. From the iconic skyline to its historic neighborhoods, Chicago’s buildings play an outsized role in its reputation as a world class city that still feels like a small town and influences how millions of people live, work, play, and gather every day.

Chicago is a vibrant city with a rich history of coalition building and activism related to its built environment. The 1909 Plan of Chicago centered the people of Chicago as it laid ambitious plans for the lakefront, parks, streets, and civic and cultural centers among other city planning improvements. The upcoming We Will Chicago Plan continues the vision of a civically engaged and informed public, making multiple pathways of engagement so all voices and experiences may shape the plan. Civil rights and social activists, such as Ida B. Wells, Jane Addams, and Hazel Johnson, laid the foundation for community-based organizations and advocacy groups to use their voices to improve the quality of life their communities were experiencing in Chicago. Today, there are many kinds of civic, social and advocacy organizations that provide the capacity and opportunities for community voices to remain lifted and have also helped communities across the city bear the burdens of the impact of the COVID-19 pandemic. Civic participation and activism across all communities and all sectors is quintessential to Chicago’s public identity and continues in the work of building decarbonization.

While reading the report, it is important to acknowledge that this work is informed by many decades of voices and votes that have transformed City policies and programs; and that the development of this report and the correlating work is taking place during a period of historical reckoning of injustices that have left communities across Chicago divested and under-resourced. The City and the Working Group led with equity to ensure that intentional, respectful collaboration and consideration of all Chicagoans lived experience drove the process for effectively addressing complex challenges in the built environment.

The priority for the Working Group was to develop an equity-centered building emissions reduction strategy that lowers economic burdens on residents and businesses, reduces energy insecurity for communities of color, and uses an equity lens to assess the cost and impact of these strategies. Equity was integrated throughout the development of this report – from stakeholder engagement and comprising the Working Group to developing each recommendation. The charge also called for considering multiple pathways to decarbonization – energy efficiency, electrification, renewable energy, and others – and developing the social capital and resources that support those pathways, such as resilient communication networks with communities to engage them on decarbonization efforts, workforce development, and access to financial capital for building improvements. The Working Group was comprised of 53 experts, thought leaders and affected stakeholders from community-based and civic organizations, government, academia, architecture and development, energy and other utilities, industrial and manufacturing, trade organizations, workforce development, and non-for-profits across the same sectors. The Working Group met as a corporate body and were also divided into three sub-groups – Existing Buildings, New Construction, and Financial and Technical Assistance – to develop and technically assess recommendations within each subject area.

¹ City of Chicago Greenhouse Gas Inventory Report (2017). AECOM. December 2019.

Chicagoans have a long history of actively participating in community-building activities that shape our neighborhoods and city.

Do you live in West Pullman?
Share your thoughts here!

WEST PULLMAN



The Working Group met for three months to develop the recommendations in this report. To prepare this report, the Working Group sub-groups created subject-area related visions for the future, assessed barriers to decarbonizing Chicago's existing and future building stock, used innovation and equity frameworks to develop recommended solutions, and reconvened as one group to review and refine the comprehensive work.

The vision statements reflected each sub-group's optimal state within their subject area, from which each group could back cast to the current state of the industry. The back casting exercise helped reveal barriers to building decarbonization such as building code adjustments, workforce development gaps, lack of innovative financing options, and grid infrastructure. To develop potential solutions, the Working Group responded to subject-area related examples of programs and policies in peer cities and brought forth their own ideas to discuss in their groups. The potential solutions were refined by each sub-group, then further refined through an equity framework. The potential solutions are framed as recommendations in this report.

The Working Group developed 26 recommendations that include policy change, specific actions and studies/pilots that should be considered to reach the City's emissions and equity goals.

The recommendations were grouped into four areas:

- 1) Leverage known pathways to achieve net carbon neutrality in all new buildings
- 2) Help building owners navigate pathways to improving building energy use and performance
- 3) Build, develop and support the social, financial and technical resources that result in a self-sustaining clean energy economy

- 4) Fund and prioritize equitable community engagement that cultivates resilient partnerships and advances hyperlocal benefits

The recommendations are both aggressive and actionable and build upon decades of work by both the City of Chicago and Chicagoans who have championed and implemented efforts to reduce emissions and advocate for healthier communities as part of their work in social equity, economic inclusion, and environmental justice.

This report serves as a tool for catalyzing action on building decarbonization and emissions reduction in Chicago, in a time where the funding and resources are coming online at the federal, state, and local levels to drive real change in communities. At the federal level, legislation, and subsequent programs such as the Build Back Better plan, the Bipartisan Infrastructure Bill, and the Justice 40 Initiative demonstrate that public health, equity, and economic development goals be more holistically achieved by taking action on climate. At the state level, the passing of the Climate and Equitable Jobs Act distinguished Illinois as a national leader on climate action by creating one of the most aggressive diversity initiatives for economic inclusion in the renewable and clean energy economy. In Chicago, a historic investment of \$188 million was appropriated to address environmental justice and climate action in the 2022 budget, which happened while the Chicago Building Decarbonization Working Group was developing this report. Additionally, the City of Chicago updated its climate goals via the 2022 Climate Action Plan. The time is now for bold and aggressive action to reduce emissions, reduce energy insecurity and create more opportunities for inclusive economic growth. The spirit of the City's history and vision of a more equitable future for all Chicagoans demands a rise to the challenge.

The Recommendations

Section 1: Leverage known pathways to achieve net carbon neutrality in all new buildings

1	Policy	Regularly increase requirements for energy efficiency and building performance while phasing out allowed uses of fossil-fuel-burning equipment for both new buildings and in connection with major renovations.
2	Policy	Implement a mandated Fossil Fuel Mitigation Fee for any new construction that is built with fossil fuel burning equipment during the phased adoption of eliminating fossil fuels in new buildings.
3	Policy	Empower the Zoning Administrator, Building Commissioner and related administrative bodies to grant administrative relief and/or implement incentives and bonuses that explicitly further decarbonization goals.
4	Policy	Establish an advisory group to regularly review and make recommendations to amend technical construction and zoning requirements to promote decarbonization through the design and construction of new buildings based on stakeholder input and national/ international best practices.
5	Policy	Implement a phased approach to transition city-funded new construction projects from fossil fuel energy sources to all-electric buildings with low carbon considerations that ultimately result in a net zero carbon code.
6	Action	Increase City staffing to support new building decarbonization policies and actions.
7	Action Study	Identify and develop demonstration projects depicting Whole Life Cycle Carbon Zero analyses among several different building sectors, then widely publicize the educational findings while deploying targeted messaging for numerous audiences.

Section 2: Help building owners navigate pathways to improving building energy use and performance

8	Policy	The City of Chicago should expand the Chicago Energy Benchmarking ordinance to apply to most buildings, with tiered compliance based on building size and type, and provide voluntary benchmarking opportunities and incentivized options for the smallest properties not covered by the ordinance.
9	Policy	Building off of the City of Chicago's successful Energy Benchmarking Ordinance, the City should adopt a Building Performance Standard that establishes energy performance targets for most existing buildings and provide voluntary and incentivized options for the smallest properties not covered by the ordinance.
10	Action	Urge other taxing bodies to protect building owners from property tax increases related to clean energy upgrades and support protecting tenants from bearing the direct costs of clean energy upgrades.
11	Study	Conduct a building segmentation and characterization study that will inform energy efficiency, renewable energy and other clean energy building improvements.
12	Action	Develop a heat pump pilot project to emphasize and encourage the adoption of new but proven technologies, while considering other emerging technologies for pilot projects.

Section 3: Build, develop and support the social, financial and technical resources that result in a self-sustaining clean energy economy

13	Action	Develop a Building Decarbonization Hub and corresponding decentralized “community hubs” in priority neighborhoods.
14	Action	Form a Green Bank for Chicago.
15	Study	Conduct a study to better understand the viability of Property Assessed Clean Energy (PACE) financing and other low-cost green loan structures.
16	Action	Provide historically underserved communities with deep, local and inclusive engagement efforts that result in broad participation of energy efficiency, renewable energy and electrification strategies and incentives.
17	Action	Seek out state and federal funding to develop resources and fund the work.
18	Action	Seek support from public and private philanthropy.
19	Action	Develop and support multiple workforce development, career development and small business development trainings related to the growth in “green jobs” already occurring and expected to occur as the built environment embraces decarbonization. Further, target participation in historically marginalized communities as an avenue for building community wealth.
20	Action	Develop and sustain robust external-facing training on construction and zoning code requirements.
21	Action	Develop a building decarbonization directory of vendors, products and service providers that is accessible to the public.
22	Study	Create a just and equitable economic transition plan for the fossil gas industry in Chicago, which will be impacted by these decarbonization goals.

Section 4: Fund and prioritize equitable community engagement that cultivates resilient partnerships and advances hyperlocal benefits

23	Action	Develop an equitable outreach and engagement plan that prioritizes repairing, building trust, and investing in communities that have not been engaged in or informed about decarbonization initiatives, and creates pathways for strengthening relationships among stakeholders for coordinated and diverse cross-sector collaboration.
24	Action	Leverage cross-sector relationships to develop nuanced, multi-disciplined partnerships and funding opportunities.
25	Action	Strategically invest in demonstration projects.
26	Action	Fund and support the broad expansion of community solar and central community systems, other onsite/offsite renewable energy systems, and related resilience measures to advance a successful clean energy transition.

Mayor Harold Washington celebrates with Chicagoans at the 1987 Bud Billiken Parade on Chicago's south side. ►

“And believe me, the neighborhoods of Chicago are mighty proud and mighty strong... in Chicago, you work with neighborhoods, not around them, and not without them.”

— Harold Washington, during a speech for the American Planning Association on 9/30/83



Introduction

Chicago Leads: Opportunity to Shape Policy

The legacy of Chicago's built environment is innovation. In 1885, the construction of Chicago's Home Insurance Building redefined urban architecture and made Chicago the birthplace of the skyscraper. The structure reached unprecedented heights, and fundamentally changed big-building design theory. Today, Chicago currently ranks as one of the world's largest skylines, spanning from one end of its lakefront to the other. The evolution of Chicago's built environment also mirrors the story of Chicago. The first building code was adopted in 1875 in response to the Great Chicago Fire just four years earlier. By the end of the century, the City's Department of Buildings was formed. In the early 1900s as immigrants flocked to urban centers, tenement housing laws were enacted to protect the health and safety of people living in tenement-style buildings. And as Chicago faces the challenge of adapting to and mitigating climate change, once again, its buildings play a significant role in keeping Chicagoans safe and healthy.

The City of Chicago is committed to achieve a 62% overall reduction in greenhouse gas (GHG) emissions by 2040², while powering 100% of its buildings with renewables by 2035³. As it stands, the built environment of Chicago is responsible for 70% of the City's total GHG emissions. These emissions primarily result from electricity consumption (cooling, lighting, and plug loads), fossil gas combustion (space heating and hot water) and manufacturing industries.

Given that the overwhelming majority of GHG emissions are attributed to standing infrastructure, Chicago's built environment must play a leading role in a robust climate strategy. It is essential to invest in the existing and new building stock to reduce GHG emissions, drive equitable solutions,

and keep Chicago's communities healthy. A well-planned, community-based building decarbonization initiative will create good-paying sustainable jobs, lower household utility costs, and accelerate a green economic recovery. Chicago is well-positioned to take on this challenge. The City has been taking concrete actions in several key areas summarized below, but is not taking on this challenge alone. Chicago is sometimes referred to as "the city that works," and the "city of big shoulders," meaning we are a hardworking city, committed to doing the work it takes to get things done. This longstanding civic pride is evident with the many institutions, philanthropic organizations, major corporations, community-based organizations and individuals already committed to and actively engaged in combatting climate change.

Existing Efforts

A global leader in local climate change mitigation efforts, the City of Chicago has already begun to take aggressive action to reduce community GHG emissions.

Chicago Sustainable Development Policy

In 2016, the City of Chicago commissioned an Advisory Committee of sustainability experts to update the City's Sustainability Development Policy (SDP)⁴. The SDP mandates that development projects seeking municipal funding or special approvals must include enhanced sustainability features. Under the policy, each development project is assigned a point value that it is required to reach. Respondents are allowed to select from a list of sustainability strategies worth varying points in order to meet their benchmark. The SDP has already led to significant increases in the quantity of green roofs and certified buildings.

Building Code

Construction codes are an effective tool to help protect the environment and reduce energy consumption. Chicago has taken huge strides in

² Chicago Climate Action Plan, City of Chicago, 2022, https://www.chicago.gov/content/dam/city/sites/climate-action-plan/documents/CHICAGO_CAP_20220429.pdf

³ Resolution R2019-157, City of Chicago, <https://chicago.councilmatic.org/legislation/r2019-157/>.

⁴ Chicago Sustainable Development Policy, City of Chicago, 2017, https://www.chicago.gov/city/en/depts/dcd/supp_info/sustainable_development/chicago-sustainable-development-policy-update.html.



recent years to strengthen the energy efficiency requirements in the construction codes. Specifically, the City adopted the 2018 edition of the International Energy Conservation Code⁵ in 2019 and will adopt the 2021 edition in 2022. The City has also recently adopted enhanced requirements for energy efficiency and sustainability in its Electrical Code, Mechanical Code and Plumbing Code.

Retrofit Chicago

Retrofit Chicago⁶ is a voluntary program that incentivizes building owners to commit to reducing energy consumption by 20 percent in 5 years. Launched in 2012, Retrofit Chicago has grown from a dozen to over 75 buildings covering more

than 50 million square feet. The program produces custom Energy Road Maps for building owners to explore routes to cut energy use and increase annual savings. In 2018, City officials estimated the program had reduced emissions by 70,000 metric tons and saved 90 million kW-hours annually based on energy reporting by building owners. The City is identifying ways to expand participation beyond the downtown core to allow other buildings to participate and benefit from the shared expertise and resources.

Energy Benchmarking

Passed in 2013, the Chicago Energy Benchmarking Ordinance⁷ requires residential, commercial and institutional buildings over 50,000 square feet to

⁵ Chicago Construction Codes, City of Chicago. https://www.chicago.gov/city/en/depts/bldgs/provdrs/bldg_code/svcs/chicago_buildingcodeonline.html

⁶ Retrofit Chicago, City of Chicago. https://www.chicago.gov/city/en/progs/env/retrofit_chicago.html.

⁷ Chicago Energy Benchmarking, City of Chicago. https://www.chicago.gov/city/en/depts/mayor/supp_info/chicago-energy-benchmarking/ChicagoEnergyBenchmarkingOverview.html.



Illinois' Climate and Equitable Jobs act targets \$80 million per year for clean energy workforce and contractor development programs in Black and Brown communities.

report energy consumption annually. The goal of the program is to enable building owners and tenants to make informed decisions about energy consumption and encourage energy efficiency, and also provides insight for the City to better target program resources. The 2019 Chicago Energy Benchmarking Report⁸ highlighted nearly \$74 million in savings from energy reductions and its highest compliance rate to date at 91% of buildings covered under the ordinance. Further, the new Chicago Energy Rating System⁹ requires building owners to display their energy performance to the public through a placard. Chicago was the first city in the United States to mandate this level of public transparency for energy consumption.

Illinois' Climate and Equitable Jobs Act

The Illinois Climate and Equitable Jobs Act (CEJA) was passed in September 2021 by the Illinois State Legislature. CEJA sets Illinois on a path to 100% clean energy by 2050 and 100% carbon-free power

by 2045. Beyond renewable energy build-out, CEJA also commits to holding utilities accountable, creating an equitable clean energy future for all, ensuring affordability of energy bills, assisting the transition of fossil fuel communities, and creating good paying carbon-free jobs. Stand-out actions include an annual \$80 million commitment to workforce and contractor development in equity focused communities, minimum diversity and equity requirements for renewable energy projects, ending formula rates, a \$40 million grant program for fossil fuel communities in transition, and an annual \$80 million for electric transportation projects.

2022 City of Chicago Budget

In October 2021, the Chicago City Council approved the 2022 budget that will advance Mayor Lightfoot's Green Recovery Agenda and by investing \$188,000,000 in a variety of climate and environmental projects including building decarbonization and retrofits in low to moderate

8 2019 Chicago Energy Benchmarking Report, City of Chicago, 2019, <https://www.chicago.gov/content/dam/city/progs/env/Energy-Benchmark-Reports/2019-Chicago-Energy-Benchmarking-Report.pdf>.
9 Chicago Energy Rating, City of Chicago, <https://www.chicago.gov/city/en/progs/env/ChicagoEnergyRating.html>.

income households and community anchor institutions across the city, green infrastructure resilience efforts, tree canopy expansion, and key community-scale benefits. The budget commitment is the single largest one-time climate investment in the City’s history and will help the City achieve critical resilience and mitigation goals, while equitably distributing benefits across the City.

Upcoming Efforts and Opportunities

Recent and ongoing decarbonization efforts provide a framework to determine efficient and equitable solutions. There will not be a one-size-fits-all solution to building decarbonization. Therefore, any actions proposed by the CBDWG will need to coordinate with existing efforts to maximize GHG reduction.

Building Code Improvements, Cycle: 2022-2025-2028

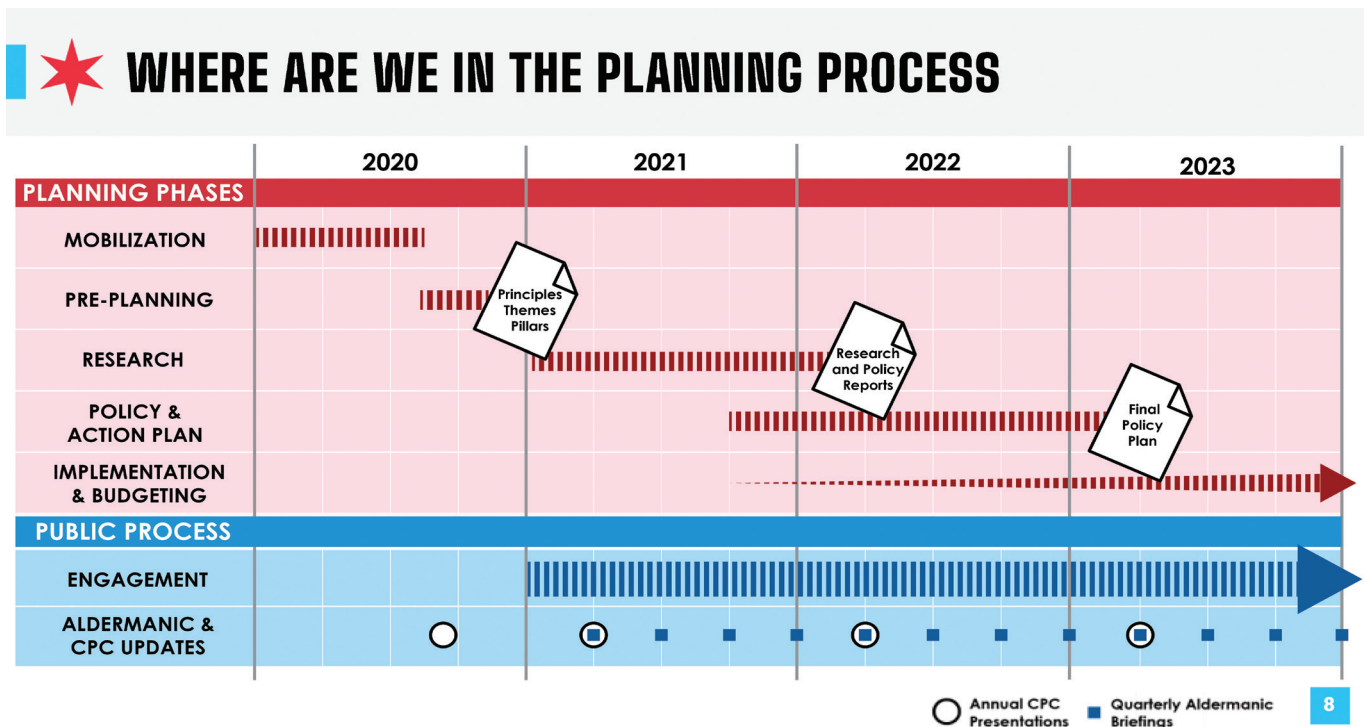
The International Code Council (ICC) has approved the 2021 International Energy Conservation Code (IECC), which achieves the biggest energy efficiency gains in the past decade, by updating requirements for insulation, lighting, and water

heating efficiency. The City of Chicago has adopted the 2021 IECC as part of the Chicago Energy Transformation Code in 2022. Under state law, Chicago can also consider a “Stretch Energy Code” starting in 2024. Regularly scheduled updates to the Chicago Construction Codes, based on model codes from the ICC and others, also provide opportunities to facilitate and promote building decarbonization.¹⁰

We Will Chicago, 2020-2023

“We Will Chicago” is a three-year, citywide planning initiative to encourage growth while addressing social and economic inequalities, and is the first comprehensive plan for Chicago in over 50 years. Currently underway, a wide range of City department officials and stakeholders from across Chicago are deeply engaged in the second phase of the project, aimed at developing research and policy reports among the seven pillars of focus: arts and culture; economic development; environment, climate and energy; housing and neighborhoods; lifelong learning;

¹⁰ New Buildings Institute, *Stretch Codes*, https://newbuildings.org/code_policy/utility-programs-stretch-codes/stretch-codes/.



We Will Chicago’s multi-phased planning process will result in Chicago’s first comprehensive plan in over 50 years

public health and safety; and transportation and infrastructure. Led by the Department of Planning and Development (DPD), programmatic efforts began in 2020 with the launch of a public engagement effort. Within this framework, the City will prioritize long-term resiliency by supporting the development of a greener economy, the use of green building technologies in new construction projects, and the involvement of a broad range of constituencies and community representatives in future environmental decision-making.

Municipal Clean Energy Transition by 2025

In 2017, the City of Chicago committed to power all municipal buildings and operations with 100% renewable energy by 2025—ten years ahead of the community wide goal. This same goal is a key action outlined in the 2022 Climate Action Plan. In September 2020, the Department of Assets, Information, and Services (AIS) issued a Request for Proposal (RFP) to identify a retail energy supplier to provide renewable, clean energy. In August 2022, the City announced an agreement to source 300 megawatts from a clean, renewable solar energy generation installation to be built in central Illinois, representing 70% of the City’s municipal energy consumption, the balance of which will be procured through renewable energy credits (RECs). This solar development will achieve the City’s goal and begin powering the City’s buildings by 2025. Finally, the agreement features provisions for community co-benefits and good faith commitments to meet equity and labor standards outlined in the Illinois Climate and Equitable Jobs Act. As the City leads by example in this transition to clean energy, this project will serve as a model for other large energy users in Chicago and elsewhere.

Community Goal: 100% Renewable Energy by 2035

In 2019, the City of Chicago made history by becoming the largest city in the United States to commit to 100% clean energy supply by 2035. The City Council passed a resolution to power the City with clean and renewable energy by 2035, and completely electrify the public bus fleet by 2040. This resolution was one of the key

initiatives in the “Resilient Chicago” road map for the future of Chicago. Solutions to reach this goal will be driven by changes to Chicago’s built environment that drive job growth and deliver direct benefits to Chicagoans.

Green Recovery Agenda

The Green Recovery Agenda charts Chicago’s sustainable, economic and social recovery from the COVID-19 pandemic. Announced on Earth Day 2021, Mayor Lori Lightfoot’s Green Recovery will improve the overall livability of the City by creating quality jobs, dramatically reducing GHG emissions, reducing energy insecurity, and committing to a renewable energy future. The platform has four key pathways: (1) a Chicago Climate Action Plan, (2) an Electricity Franchise Agreement, (3) Procurement of a Renewable Electricity Supply, and (4) Building Decarbonization.

In September, Mayor Lightfoot advanced these commitments during the 2022 Budget Address as she announced the investment of \$188 million to address climate change and environmental justice issues. This funding, representing the largest one-time investment of this kind in City history, will deliver on equitable co-benefits that bring economic prosperity to neighborhoods across Chicago. Among the highlighted elements is funding for energy efficiency and renewable energy projects for low to moderate income households and community anchor institutions.

Chicago Climate Action Plan, 2022

In 2008, Chicago was one of the first major American cities to develop a set of comprehensive climate goals and strategies. The city’s first Climate Action Plan presented both mitigation and adaptation strategies to address the intense impacts that dense urban centers have on the climate. In May 2022, City officials released the updated 2022 Chicago Climate Action Plan with new emissions reduction targets and adaptation strategies that reflect the level of ambition required for meaningful reductions to Chicago’s GHG emissions while achieving community-level

climate adaptation, and create green, livable job opportunities. The plan builds upon existing policy goals and captures strategic priorities across departments to ensure climate investments advance racial and economic equity.

Electricity Franchise Agreement

The City of Chicago is at an important turning point in the history of its electric distribution system. For the first time in nearly 30 years, the City has the opportunity to negotiate or replace its current electricity franchise agreement with Commonwealth Edison (ComEd). The City has the power to ensure that climate justice goals and equitable community benefits are at the forefront of the future operation and management of Chicago's electric distribution system. While the final decision is yet to be announced on the future of the City's electricity franchise, City officials have ensured the agreement will prioritize governance and transparency, energy and electrification, and equity and neighborhood development goals.

Building Decarbonization

As part of the Green Recovery Agenda, the City of Chicago is committed to a building decarbonization strategy that develops an equity-focused building emission reduction strategy which lowers economic burdens on residents and businesses through energy efficiency, renewable energy, electrification and innovation in new construction. In 2020, the City of Chicago assembled a Building Decarbonization Project Team in order to guide the development of a set of actionable building decarbonization policy and program recommendations. The Working Group is comprised of representatives from the private, public and non-profit sectors, including sustainability specialists, architects and design professionals, workforce development agencies, builders and developers, building managers and operators, small businesses, community organizations, utilities, environmental justice and advocacy groups, climate-focused youth groups, labor unions, and universities. This diverse group of stakeholders divided itself into three sub-groups: New Construction, Existing Buildings, and Financial Programs/Technical Assistance. The

policy development process included four phases: (1) best practices research, (2) extensive stakeholder engagement, (3) Policy Development Working Group, and (4) ongoing policy development and implementation.

Challenges

The Working Group identified several critical challenges to decarbonizing Chicago's building stock that need to be addressed over the coming years. These challenges are summarized below.

FINANCIAL: There is a general lack of financial incentives for building decarbonization. As it stands, the majority of financial assistance is grant funded and will not be scalable to fit the need. Resources to fund decarbonization measures in all buildings must be identified.

TECHNICAL UNDERSTANDING: Significant knowledge gaps exist as to how to decarbonize buildings. Information is not readily accessible and public understanding of a key solution, building electrification, is minimal. There is also a lack of awareness of existing utility programs, rebates, retrofits, and energy efficiency benefits. While there is general knowledge around energy efficiency and renewables, the lack of uptake indicates it has not yet become mainstream and should be addressed.

CAPACITY: A formidable challenge is building a communicative network of actors that can design, pilot and scale decarbonization projects across the city. There is a limited workforce to achieve retrofits needed at scale. There is also limited capacity among city agencies to rapidly uptake decarbonization projects and provide citywide support among their other priorities. Community-based organizations, nonprofits and other non-commercial entities will also need to build capacity to support community-engagement and residential energy transitions. This will be important for achieving the cost savings and energy reduction in older and smaller residential properties that will need retrofits. Large entities, like the City, commercial business, housing providers or industrial operations, will be facing new challenges

navigating ambiguities in innovation, shifting power dynamics, and identifying new drivers for inclusive economic growth.

EQUITY: Building decarbonization benefits need to target frontline communities where home and business owners who can most benefit from upgrades must be equipped with the right tools, information, and access to capital to effectively participate and complete projects. Fuel switching away from fossil gas will be a gradual process, unless specific emphasis is placed on prioritizing underserved communities, the process will likely start with property owners and managers who can afford it and prefer electric alternatives. This unmanaged transition could shift more utility costs to already burdened communities, causing a further imbalance in who receives the benefits of a decarbonized city. This cannot be allowed to happen. Building upon existing relationships and utilizing trusted messengers is another core component of this work.

MUNICIPAL/INSTITUTIONAL: Many recommendations in this report will require legislation, rulemaking, and operational changes by the City. The city departments expected to operationalize new programs will also require adequate human and technological resources to achieve swift, successful, transparent, and scalable implementation. Robust, interconnected, and mobile IT systems will be especially critical for programs related to permitting and inspections. The City will also need to work hard to establish new community partnerships while bolstering existing ones. In addition, climate action and more specifically building decarbonization, is only one of many priorities that the City is addressing. The challenge of navigating programmatic changes, garnering internal City support and external community support, and identifying appropriate implementation methods and partners will require thoughtful coordination. Cooperation with state and federal agencies that oversee programs and

funding related to energy and climate change mitigation will also be necessary.

POLITICAL: Given the many stakeholders across Chicago that these recommendations will touch when implemented, the City cannot discount the political nature of the work ahead. Further, the increasing politicization of climate change serves to exacerbate even the smallest of tensions. Alternatively, however, recent state and federal climate policy adoption very much align with addressing building decarbonization rapidly and definitively. Illinois state legislature recently adopted the Climate and Equitable Jobs Act that establishes aggressive climate goals paired with unprecedented levels of state funding for implementing solutions. The Biden Administration's clean energy goals and funded commitments to target 40% of the benefits in historically under resourced communities offer a huge opportunity for Chicago's neighborhoods – this moment in time represents an opportunity for Chicago to take advantage of politically-aligned climate goals that will benefit Chicagoans for decades. That said, it does not take away from the important conversations with local elected officials, community leaders, business owners, residents and other stakeholders that must continue to happen. These on-the-ground conversations are necessary to achieve general consensus, address valid concerns and ultimately craft stronger, implementable policies and programs.

DECISION MAKING: During the authoring of these recommendations, the Working Group utilized a consensus-driven approach, which does not necessarily imply 100% unanimity on every single idea, but rather, group alignment on the direction and ambition of each recommendation. The proposed implementation tactics of each recommendation reflect the range of thoughts, opinions, and the nuanced experiences from a wide range of stakeholders. These kinds of conversations must continue all across Chicago and engage people from all walks of life.

Process+Project Descriptions

Project Team

This report is the result of a team effort, supported by the City of Chicago and its partners, and guided by ideas and recommendations from the 53-member Building Decarbonization Policy Working Group. The Working Group included representation from sustainability experts, builders and developers, architects, building operations and management officials, utilities, community-based organizations, economic development groups, real estate experts, and others.

CHICAGO BUILDING DECARBONIZATION POLICY WORKING GROUP. The assembled Working Group brings together local stakeholders whose role was to deliver a set of recommendations to the City of Chicago for its building decarbonization strategy. The Working Group convened a series of seven facilitated meetings from June through August 2021. Topical breakout groups met in between meetings, and conducted additional individual and group research. The following recommendations are the outcome of their commitment.

CITY OF CHICAGO OFFICE OF SUSTAINABILITY. Situated in the Mayor's Office, the Chief Sustainability Officer is flanked by a supportive team of policy experts that work directly and indirectly on this team. Direct team members include Angela Tovar, Kyra Woods, and Gavin Taves. In addition, Grant Ullrich from the Department of Buildings joined Ms. Tovar's Sustainability team members to round out the City of Chicago team.

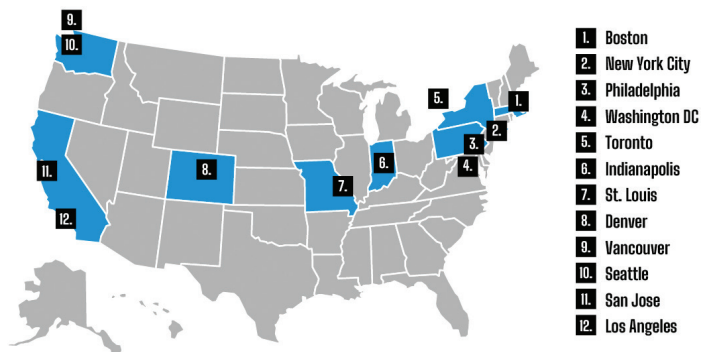
NATURAL RESOURCES DEFENSE COUNCIL (NRDC). NRDC, along with Delivery Associates, are the leading partners implementing the American Cities Climate Challenge. The NRDC team that has

been working on this project includes Julia Murphy, Kari Ross, Mary Nicol and Stefan Schaffer.

ELEVATE. Elevate is a 20-year-old Chicago-based non-profit organization specializing in equitable climate action. Members of the project team include Anne Evens, Sandra Henry, Elena Savona, Lindy Wordlaw, Anthena Gore, Gustavo Sandoval. Elevate is supported by additional staff serving as subject matter experts or as administrative support.

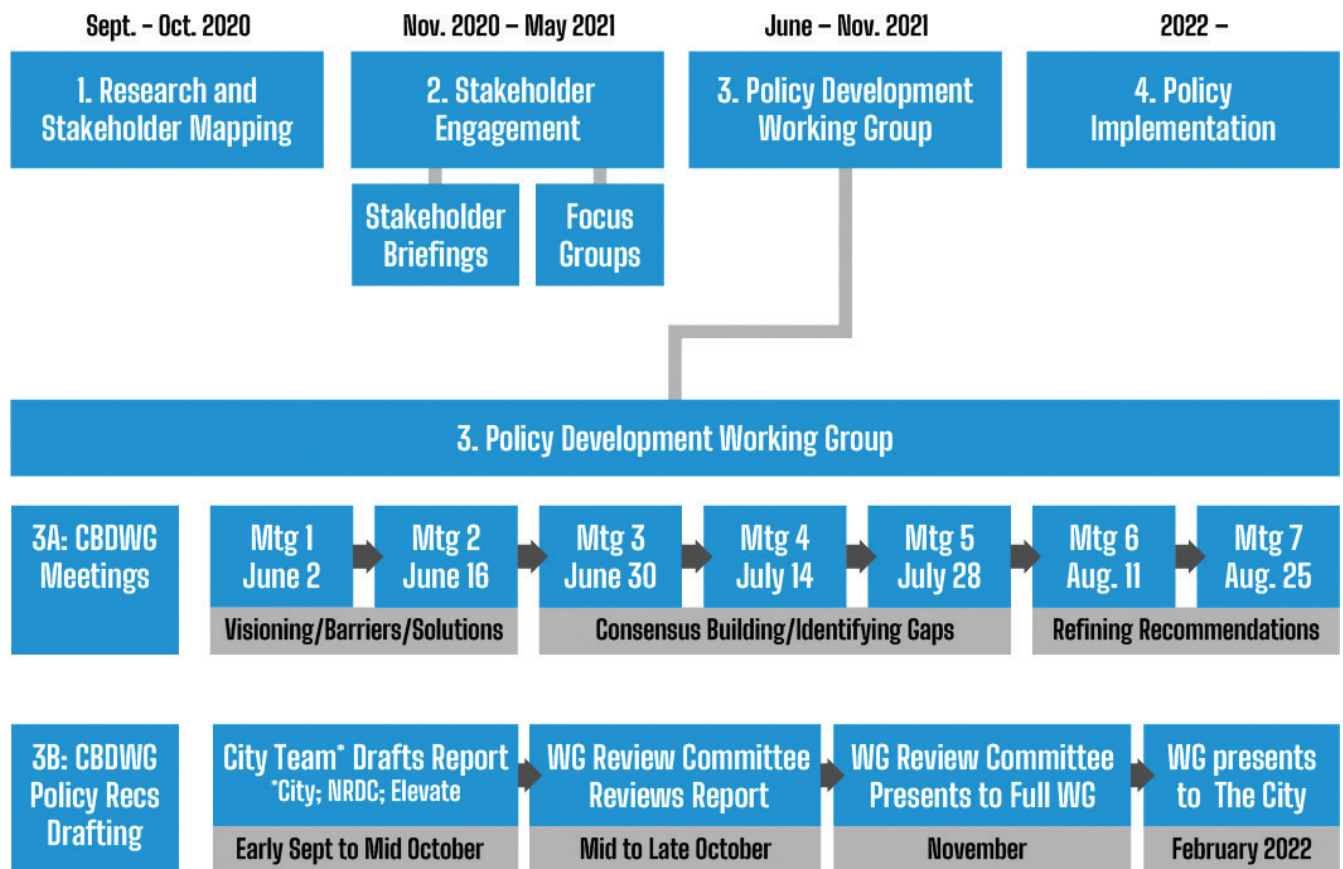
AMERICAN CITIES CLIMATE CHALLENGE. Funded by Bloomberg Philanthropies, the Climate Challenge was launched in 2019 to provide powerful resources and support to 25 of the largest U.S. cities in their fight against climate change. NRDC and Delivery Associates, along with other national and local partner organizations, lead the implementation of the Climate Challenge and support the Working Group.

Project Phases



Phase 1: Best Practices Research – August 2020 through October 2020 Initial Research

The Project Team selected 12 North American cities with established commitments to decarbonization or net zero emissions goals to conduct initial research on their policies and the structure of their decarbonization commitments. These cities researched were Boston, Denver, Indianapolis, Los Angeles, New York City, Philadelphia, St. Louis, San Jose, Seattle, Toronto, Vancouver, and Washington DC. Among the selection were east and west coast cities, large and medium-sized cities, those with long climate action track records, and other considerations.



The four phases of developing a decarbonization strategy for the City of Chicago.

The initial research scope included the following criteria:

Table 1. Best Practices Research Parameters

About the City/About the Policy	Supporting Implementation Activities
Census Housing Profile (or QuickFacts) about the community	Evidence of/documented Stakeholder Engagement
Policy/Code Snapshot Description	Evidence of/documented Equity Considerations
Adoption Date/Timebound Elements	Evidence of/documented Funding/Financing mechanisms
Policy Scope/Requirements	All other complementary resources
Building sectors affected	Other related policies (e.g., specific renewable energy policies; transportation decarbonization strategies)
New construction/Existing Buildings or both	Any unique attributes

Table 2. Interview Schedule

City	Date	Interviewee(s)
Boston	10/13/2020	Boston Green Ribbon Commission
Denver	10/1/2020	Office of Climate Action, Sustainability and Resiliency
Indianapolis	10/6/2020	Office of Sustainability
Los Angeles	10/8/2020	Office of Sustainability
New York City	10/19/2020	Mayor’s Office of Climate and Sustainability
Saint Louis, #1	10/9/2020	Sustainability Office
Saint Louis, #2	10/16/2020	Buildings Department
San Jose	10/6/2020	ClimateSmart San Jose
Seattle	10/8/2020	Office of Sustainability and Environment
Toronto	10/15/2020	Department of Energy and Environment
Washington DC	10/19/2020	Department of Energy & Environment
Vancouver	10/9/2020	Department of Planning, Urban Design, and Sustainability

In-depth Interviews

Next, the Project Team contacted key sustainability and climate leadership in each city to introduce them to Chicago’s efforts and to better understand their building decarbonization policy work. The

Interviews lasted between 45 to 60 minutes, and the team used a base set of interview questions that were then tailored for each city based on the initial research findings. The information and insights gathered in these interviews provided the City of Chicago with a wealth of information that was useful in crafting its stakeholder engagement approach and the development of the Chicago Building Decarbonization Policy Working Group. Questions were developed in three key topic areas: building/technology aspects of policy/ies, stakeholder engagement and equity, and ongoing implementation considerations. Please see Appendix 3 for a summary of research findings.

Phase 2: Stakeholder Engagement – November 2020 through May 2021 After completion of best practices research, the City of Chicago initiated a six-month series of stakeholder engagement activities aimed at understanding the diverse, sector- and community-specific perspectives on Chicago’s path to building decarbonization. The project team met with several hundred people during this phase of the project.

team conducted interviews with eleven (11) city leaders and received significant additional insight into their climate policies. The City of Chicago remains grateful to leadership and staff of these cities who took time to participate in these in-depth interviews.

Round 1

The first round of engagement involved conversations with specific stakeholder groups, including frontline communities, environmental groups and climate activists. These conversations occurred over the timeframe from November 2020 through January 2021.

Table 3. Round 1 Stakeholder Engagement Conversations, November 2020 through January 2021

Blacks In Green
Carbon Free Chicago
Chicago Corporate Sustainability Directors Network
Energy Efficiency for All (People for Community Recovery, Midwest Energy Efficiency Alliance), Community Investment Corporation), Citizens Utility Board)
Illinois Environmental Council
Illinois Green Alliance
Sierra Club/Ready for 100
Southeast Environmental Task Force/Southeast Side Coalition to Ban Petcoke
Alderman La Spata’s community council

Discussions included conveyance of proposed project approach, identifying additional stakeholders for outreach and inclusion in the effort, and general recommendations and considerations for developing a building decarbonization strategy for Chicago. At the end of every session, participants were invited to continue in the process for upcoming focus groups, as well as participation in the (eventual) Chicago Building Decarbonization Policy Working Group.

Round 2

At the culmination of the first round of stakeholder engagement, the project team developed a series of focus group sessions, with a goal of learning key industry and insights from specific sector and end-user perspectives. Discussions were similar to Round 1 meetings, however there was less focus on identifying more stakeholders, and instead, discussion on focused topics related to the expertise of the participants.

Table 4. Round 2 Focus Group Meetings, February through May 2021

Affordable Housing/Tenants/Renters
Builders and Developers
City Departments/Sister Agencies
Community Organizations and Advocacy Groups
Design Professionals
General Session
Green Jobs/Workforce Development
Higher Learning
Labor
Manufacturing and Industrial
Property Owners/Managers; Business Associations
Sustainability Specialists
Small Business
Youth

Please see Appendix 4 for a table of the stakeholder engagement key takeaways that stakeholders emphasized numerous times over the 23 meetings with stakeholders.

Phase 3: Chicago Building Decarbonization Policy Working Group – June through November 2021

The Chicago Building Decarbonization Policy Working Group met over the course of several months and was comprised of key stakeholders identified during the stakeholder engagement activities in Phase 2. The Working Group organized itself into three Sub-Groups: New Construction, Existing Buildings; and Financial Programs/ Technical Assistance and met for a series of seven meetings, with additional group and individual work. In the fall months the Project Team and a smaller subset of the Working Group developed this report to capture all of the conversations and ideas shared, resulting in this Recommendations Report.

Phase 4: Policy Development and Implementation – Ongoing

The 26 recommendations in this report will be presented to City staff and officials. Each of the policies, actions and studies will have different implementation timelines, partners, and funding sources. Some recommendations are already gaining traction within the context of existing City programs and with strategic community partners, including initial groundwork for the development of a “building innovation hub” to provide coordinated technical assistance, as well as a residential energy retrofit demonstration project.

Recommendations from the Chicago Building Decarbonization Policy Working Group

In Chicago, approximately 70% of the City's emissions are attributed to stationary energy consumption-commercial and residential buildings, manufacturing and construction.¹¹ Therefore, achieving significant emissions reductions must include a strong emphasis on addressing the city's building stock. First and foremost, the City needs to ensure that what is being built now and in the future results in little to no additional carbon outputs, and second, that it harnesses technologies that exist now to retrofit homes, businesses and institutions to reduce their carbon footprints. while offering a range of additional co-benefits that includes improved indoor air quality and overall health, lower energy costs, an influx of "clean energy" jobs, and increased competitiveness for local business owners.

The following recommendations presented by the Chicago Building Decarbonization Policy Working Group (CBDWG) include multiple pathways to implement a broad decarbonization strategy for Chicago - energy efficiency, renewable energy and electrification - as there is not a "one size fits all" solution. Further, the CBDWG recommends a mix

of policies, actions and studies that address both new construction and existing buildings. During deliberation and discussion over the course of several months, the Working Group examined emissions reduction potential, other ancillary benefits, potential barriers and then thoroughly examined each for its impacts on people and places by employing an "equity scan." The CBDWG and City of Chicago are committed to crafting a visionary agenda that achieves the City's climate goals and results in deep, hyper-local benefits for our communities.

Recommendations are categorized in the following sections:

- Leverage known pathways to achieve net carbon neutrality in all new buildings
- Help building owners navigate pathways to improving building energy use and performance
- Build, develop and support the social, financial and technical resources that result in a self-sustaining clean energy economy
- Fund and prioritize equitable community engagement that cultivates resilient partnerships and advances hyperlocal benefits

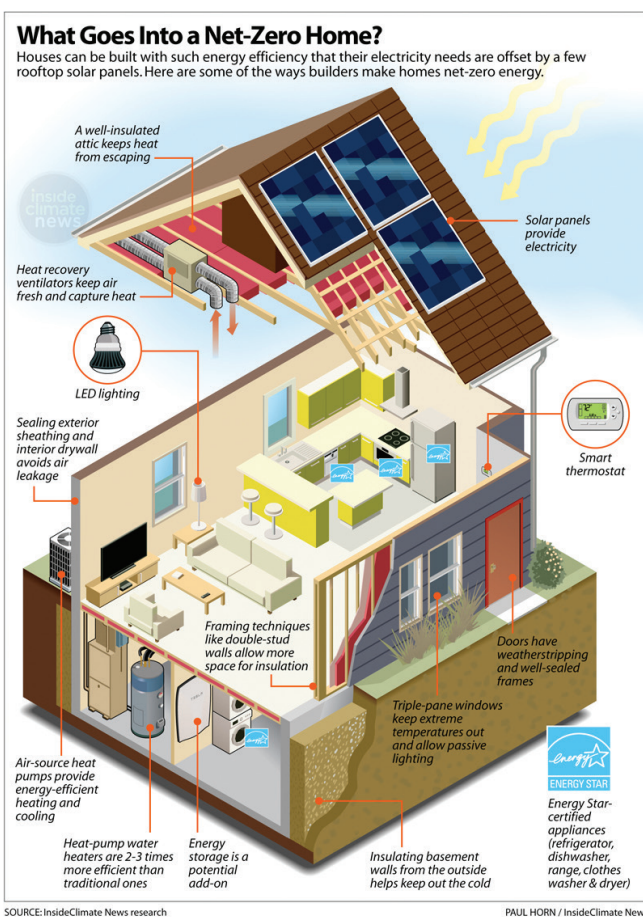
Recommendations Section 1:

Leverage known pathways to achieve net carbon neutrality in all new buildings.

Globally, two thirds of the buildings that exist today will still be standing in 2040¹² - in other words, once built, the lifetime of a building can last 70 to 80 years, and more. Given this longevity, it is crucial that the City address energy performance at the time of construction, when it is easier to enforce, compliance can be easily monitored, and is less costly to implement in comparison to retrofitting buildings for efficiency later. Chicago already boasts a strong energy code based on the International Energy Conservation Code, and having a strong energy code establishes a great foundation that allows Chicago to be a leader in decarbonizing its buildings.

¹¹ City of Chicago Greenhouse Gas Inventory Report (2017). AECOM. December 2019.

¹² "Why The Building Sector?," Architecture 2030, <https://architecture2030.org/why-the-building-sector/>.



Features of a Net Zero Home.
Credit: InsideClimate News, Paul Horn

Recommendations 1 (POLICY) Regularly increase requirements for energy efficiency and building performance while phasing out allowed uses of fossil-fuel-burning equipment for both new buildings and in connection with major renovations.13

As the availability of renewable sources of electricity becomes more readily available, carbon emissions associated with electricity consumption are significantly reduced. However, the emissions associated with fossil gas combustion are a direct fossil fuel source that can only be reduced, not mitigated. As such, the City of Chicago should pursue adoption of new buildings codes that eliminate fossil gas and

other fossil fuel consumption while significantly reducing energy consumption and supporting the development of high performing buildings. It is recommended that this apply to all buildings types, and that it is thoughtfully phased in to consider the range of challenges for owners of building sizes and types, and to be further defined in the policy development process.

The Working Group recommends setting the long-term goal of eliminating fossil gas and other fossil fuel consumption in the City’s buildings code, then establishing reasonable incremental goals that ultimately lead to full adoption of this requirement. At minimum, the City should consider alignment with the International Panel on Climate Change (IPCC) recent report targeting net zero carbon by 2040. Phased adoption can occur, beginning first with building typologies where the technology exists for full electrification. The Working Group recommends action on this initial fossil fuel ban as soon as politically possible. Additional stepped adoption targets should be identified that allow the marketplace to catch up. For example, the City of Denver’s 2020 Net Zero Energy New Buildings and Homes Implementation Plan aims to phase in requirements over a six-year period, first targeting all new homes, requiring commercial buildings to comply three years later, and the final phase steepens requirements by adding performance verification requirements to the code.¹⁴

Net zero operational energy buildings are defined as highly energy efficient buildings that produce on-site, or procure, enough carbon-free renewable energy to meet building operations energy consumption. Within the context of phased adoption targets, Chicago should pursue “Zero Energy Ready Energy Use Intensity targets”¹⁵ or similar performance indicators, including Carbon Use Intensity, that provides guidance to developers and builders. The Working Group recommends

13 “Major” renovations is based on percentage of overall floor area that is reconfigured, which is the standard used in the Building Rehabilitation Code
14 Denver’s Net Zero Energy (NZE) New Buildings & Homes Implementation Plan, City of Denver, 2021, https://www.denvergov.org/files/assets/public/climate-action/documents/denver-nze-implementation-plan_final_v1.pdf.
15 Kevin Carbonnier, “NBI Releases Zero Energy Performance Targets for New Construction Projects,” New Buildings Institute, <https://newbuildings.org/nbi-releases-zero-energy-performance-targets-for-new-construction-projects/>.

crafting this approach such that it allows a variety of pathways involving aggressive energy efficiency and onsite renewable energy. The technologies exist now to implement this recommendation, and additional recommendations outlined below note opportunities to support their uptake. Additional study on back-up generation for onsite or offsite renewables, commercial cooking and refrigerants will be required over the course of phased adoption, but it should not preclude the adoption of the longer-term goal.

In addition to the primary goal of reducing emissions, there are additional anticipated co-benefits too. A recent case study in Denver showed that construction costs for all-electric homes and commercial buildings were lower, and resulted in immediate upfront energy cost reductions for building occupants. Conducting more localized studies would be beneficial in Chicago. Further, electric induction cooking improves both kitchen safety and indoor air quality improvements, the latter of which directly results in fewer instances of asthma diagnoses and asthma symptoms. A report led by Rocky Mountain Institute, Sierra Club, Mothers Out Front, and Physicians for Social Responsibility noted that children in homes with gas stoves “have a 24–42 percent increased risk of having asthma,”¹⁶ and that “lower income populations and communities of color may be disproportionately impacted, with risk factors including increased exposure due to smaller and older homes and higher rates of asthma.” Finally, new changes in building construction creates new opportunities for workforce development skills training and career path planning, which can be targeted specifically within communities that can benefit most.

Recommendation 2 (POLICY) Implement a mandated Fossil Fuel Mitigation Fee for any new construction that is built with fossil fuel burning equipment during the phased adoption of eliminating fossil fuels in new buildings.

The Working Group acknowledges the likely need for a transitional period to all-electric buildings as the market aligns. The ascribed mitigation fees will generate revenue to be placed into a separate fund that will provide financial incentives and support for decarbonization projects in all neighborhoods and for all types of properties, with prioritization for projects located in historically under-resourced communities. Further, funds generated could be used for technical skills training and business development in net zero carbon industries and services throughout Chicago, again prioritizing residents and businesses in historically under-resourced neighborhoods. That said, the goal of this fee is to ultimately discourage the continued use of fossil fuels and ascribe a social cost to it for those developers that are unable to transition immediately.

New York City’s Local Law 97 sets limits for emissions by building type. Starting in 2025, non-compliant building owners will face fines of \$268 per metric ton of CO₂e. The law applies to any building that is also subject to the city’s energy benchmarking law.^{17, 18}

The “Fund” could be administered in several ways as noted in the examples below:

- Provide direct support to existing or new climate initiatives that support the clean energy transition in targeted neighborhoods or building sectors

¹⁶ Health Effects from Gas Stove Pollution. Seals, Brady Anne, and Krasner, Andee. <https://www.psr.org/wp-content/uploads/2020/05/health-effects-from-gas-stove-pollution.pdf>

¹⁷ Council to Vote on Climate Mobilization Act ahead of Earth Day (Press Release). April 18, 2019. <https://council.nyc.gov/press/2019/04/18/1730/>

¹⁸ Greenhouse Gas Emission Reporting for Local Law 97 in New York City, accessed on January 28, 2022. <https://www1.nyc.gov/site/buildings/codes/greenhouse-gas-emission-reporting.page>

- Target support for building owners who might not otherwise have the funds to make energy improvements
- Develop a fund similar to the grant-based Neighborhood Opportunity Fund
- Outsource fund administration to a third party for distribution under clearly defined goals and objectives, similar to how the Community Investment Corporation (CIC) provides housing rehabilitation assistance. (Note: CIC meets its naturally occurring affordable housing goals at low cost and high impact, by providing more quality units at less cost, a successful model.)

Details of the Mitigation Fee can be outlined at time of policy development, but the City may want to consider a hierarchy of penalties based on higher intensity of uses, such as cooking, water heating and space heating. It is recommended that the mitigation fee occur during the permit review process and apply only to new construction projects (and not on existing buildings or additions), and be phased in for smaller, single-site development of residential or commercial properties.

Recommendation 3 (POLICY) Empower the Zoning Administrator, Building Commissioner and related administrative bodies to grant administrative relief and/or implement incentives and bonuses that explicitly further decarbonization goals.

The rigidity of code can sometimes create unintended barriers that can be a deterrent to advanced technologies. Energy efficiency, onsite renewable energy and other clean energy advancements continue to experience fast paced growth, with emerging technologies being tested, implemented, then mainstreamed at a rapid pace. For example, if a permit applicant can demonstrate that a proposed departure from the zoning ordinance will allow an increased energy reduction or facilitate onsite energy generation, it could be beneficial to consider such a request.

The ability to accommodate new building technologies is advantageous for Chicago and will

help support implementation, while providing the necessary level of flexibility that supports, rather than hinders, progress.

Recommendation 4 (POLICY) Establish an advisory group to regularly review and make recommendations to amend technical construction and zoning requirements to promote decarbonization through the design and construction of new buildings based on stakeholder input and national/international best practices.

As building decarbonization technology and practices continue to advance, it is critical that the City stay informed of the changes; establishing an advisory group will support that outcome. The advisory group should be comprised of technical experts, stakeholders, and staff from relevant departments, and can advise on both new construction and existing buildings. The advisory group will submit formal recommendations to the mayor on an annual basis regarding technical changes to construction, zoning, and business licensing requirements that will promote the City's decarbonization commitments. The advisory group's structure and staffing will provide regular and accessible opportunities for the public and practitioners to submit recommendations and provide input on items under consideration by the advisory group.

Staff consulted should include the Zoning Administrator, Building Commissioner, Zoning Board of Appeals and other relevant officials and staff. One option could be to develop an official advisory board, such as New York City's 15-member Climate Advisory Board charged with developing a set of recommendations and rules around implementation of the City's recent emissions cap for buildings, which will go into effect in 2024 for the largest buildings.

Examples of items that the advisory group could address include:

Current construction code barriers to carbon reduction in new construction:



- Limitations on the use of wood (both mass timber and lumber) in construction that are more restrictive than the latest national model codes
- Mechanical code requirements that increase energy usage and limit adoption of innovative technology
- Plumbing code requirements that mandate use of hazardous materials such as lead, do not allow for water reuse/recapture, and increase embodied energy
- Enhanced Chicago-area electrical safety requirements that create barriers to using premanufactured/modular wall components designed to meet national model code minimums

Current zoning barriers to carbon reduction in new construction:

- Method by which floor area ratio is calculated, which penalizes thicker/better insulated walls
- Limitations on the height of rooftop features, such as solar panels and stairways for access to maintain green roofs
- Limitations on the placement of certain equipment, such as heat pumps, in required setbacks
- Predisposition against certain building materials enforced through design reviews for larger projects

Recommendation 5 (POLICY) Implement a phased approach to transition city-funded new construction projects from fossil fuel energy sources to all-electric buildings with low carbon considerations that ultimately result in a net zero carbon code.

As the City sets forth a pathway for building decarbonization in Chicago, city-funded new construction projects should reflect this commitment with a carefully phased approach. This includes both the new construction of municipal buildings, and non-municipal new construction that is receiving any City funding or incentives and may include projects of the Public Buildings Commission, INVEST South/West, or any project that received City of Chicago funding for its development.

In the immediate short term, the City should pursue electrification first, when the technologies

are available, and until then mixed fuel design while targeting aggressive energy consumption recommendations through a range of design and technologies. Over time, a phased approach should require more aggressive targets that include all-electric requirements and prohibit fossil gas in primary thermal energy. Finally, as this policy reaches its full term, the final phase of full-on implementation should require net zero energy design with performance verification before occupancy and ongoing by way of building performance standards.

Regardless of the phased approach, the City should consider other opportunities that pair with this strategic commitment and serve to further advance related building decarbonization goals and lead by example, such as:

- When possible, develop high-profile demonstration projects by securing additional budget to create educational components, case studies and other relevant material. Initial demonstration projects should begin after release of this report in order to demonstrate the alignment of vision with action.
- Calculate jobsite carbon and embodied carbon of construction materials for whole project and utilize that data to inform decisions on materials sourcing
- Conduct a lifecycle assessment of the project incorporating embodied and operational carbon and include this information in the educational programming
- Inventory current minority and women business enterprises (M/WBE) for decarbonization work
- Prioritize projects in historically marginalized and under resourced communities
- Consider updating the Chicago Sustainable Development Policy (SDP) with a similar phased in set of requirements; modify the SDP to include prerequisites around climate emergency and resilience
- Related, for all municipal new construction or major renovation projects, it is imperative that these projects meet the SDP requirements. City new construction requirements should not be less stringent than non-city new construction



requirements regardless of size, and indeed they should aspire to exceed base sustainability requirements and help drive the market.

- Costs of increased assessments, taxes, increased rent, or utility costs should not be passed on to taxpayers or building occupants

Recommendation 6 (ACTION) Increase City staffing to support new building decarbonization policies and actions.

The staffing of permitting, inspection and code enforcement departments in Chicago is lower than in many peer jurisdictions relative to both population and level of construction activity. According to internal analysis from the City, Chicago has just 19.5% and 29.2% of the building inspection staff compared to New York City and Los Angeles, respectively. The City should evaluate if staffing levels or structure of these departments is a barrier to adoption or recognition of new and

innovative technology.

As Chicago adopts new building codes aimed at decarbonization, the City should also provide training for city staff on newer technologies that will advance the City’s building decarbonization strategy. The International Code Council, publisher of the International Energy Conservation Code, offers trainings, resources and tools, and administers its ICC Preferred Provider Network to connect building officials with a network of reliable trainers. Training is vital for both understanding the code and assuring compliance.

Recommendation 7 (ACTION/STUDY) Identify and develop demonstration projects depicting Whole Life Cycle Carbon Zero analyses among several different building sectors, then widely publicize the educational findings while deploying targeted messaging for numerous audiences.

Operational carbon is the primary focus of climate



Flow diagram illustrating the building life cycle stages and beyond. Credit: UBC Embodied Carbon Pilot: Study of whole building life cycle assessment processes at the University of British Columbia., 2021

action in the United States today. However, the emergence of Whole Life Cycle Carbon Zero connects the operational, day-to-day carbon emissions with the carbon associated with materials and the construction process, commonly referred to as embodied carbon. Different scales of Embodied Carbon Demonstration Projects can showcase the impact of embodied carbon on the built environment. The focus can start with larger projects that have more resources. The Working Group encourages the City of Chicago to examine the C40 Loop competition winner as a candidate demonstration project, since it is a high profile and has been well publicized.

Further studies could include all building elements (structure, enclosure, interior, finishes, equipment, refrigerants) for large new building or substantial renovations. The demonstration project(s) should lead to carbon emission reduction top-down policies, or bottom-up reduction programs. The City could use this data as a pioneering embodied

carbon database, and consider piloting, at minimum, calculations for whole life carbon during the project development process, which will begin to build awareness and competency in this area.

Recommendations Section 2:

Help building owners navigate pathways to improving building energy use and performance.

Building owners across Chicago – residential, commercial, institutional and industrial of every size– have successfully and significantly improved building performance by reducing energy consumption and costs. These improvements also result in improved occupant comfort and indoor air quality. Broader community benefits include lowering greenhouse gas emissions, a decreased reliance on fossil fuels, reduced energy burden, improved air quality, and the creation of clean energy workforce opportunities. As we continue to grapple with an aging building stock,

we understand that the lifetime of a building can last decades to well over one hundred years, so adapting our buildings to address today's needs is vital. Chicago should build upon this foundation through a mix of policy and programmatic actions aimed at replicating these early successes, but at the grand scale necessary in order to achieve its aggressive climate goals. Further, this is increasingly important as we work to bridge gaps across historically underserved communities that are often home to older buildings with higher energy and operating costs. There are six (6) recommendations in this section.

Recommendation 8 (POLICY) The City of Chicago should expand the Chicago Energy Benchmarking ordinance to apply to most buildings, with tiered compliance based on building size and type, and provide voluntary benchmarking opportunities and incentivized options for the smallest properties not covered by the ordinance.

Beginning in 2014, Chicago began implementing its benchmarking ordinance that requires all existing commercial, institutional, and residential buildings larger than 50,000 square feet to track whole-building energy use, report to the City annually, and verify data accuracy every three years. The law covers less than one percent of Chicago's buildings, which account for approximately 20% of total energy used by all buildings. The purpose of benchmarking is to raise awareness of energy performance through information and transparency, with the goal of unlocking energy and cost savings opportunities for businesses and residents. More than 85 partner organizations publicly supported the adoption of the initial ordinance and lent their support in technical assistance, training and engagement of building owners across the city, which has led to Chicago experiencing some of the highest benchmarking ordinance compliance rates in the country. This recommendation seeks to build upon this successful foundation by expanding the benchmarking ordinance to apply to most buildings, with tiered compliance based on building size and

type, while also allowing smaller properties to voluntarily participate. While the current ordinance applies to buildings over 50,000 square feet, the City should identify a lower threshold to expand to (e.g., 25k sq ft), and broaden the ordinance to apply to industrial properties. The City should provide support and incentivize owners of smaller buildings who choose to report voluntarily. Incentives could include stronger coordination with existing utility incentives for energy efficiency and renewables, pairing building owners with energy programs led by community partners, free and easy to obtain energy assessments, additional financial support, and user-friendly technical resources specific to single family, small multifamily buildings, and small businesses. This tiered approach can segment properties by type and could include the following sectors/sub-sectors:

- Residential: Single Family, small multifamily, mid-size multifamily, large multifamily
- Commercial: small, mid-size, large
- Industrial
- Healthcare
- Religious Facilities
- Institutional/Higher Education
- Museums, Zoos, Aquariums and other cultural institutions
- Municipal Buildings

The City should build upon its technical resources currently available to provide broader technical and financial means for buildings owners that are newly required to report and to encourage the voluntary uptake of benchmarking in smaller buildings not required by ordinance to comply. Connecting to existing and proposed new resources such as the Building Decarbonization Hub (Recommendation 13) will be an important component to expanding the benchmarking ordinance, as will the likelihood for increased and well-trained staff (Recommendation 6) and using data and resources here to better support a potential building performance standard (Recommendation 9).

Finally, the City of Chicago should consider other

continued – Recommendation 8

tangential datasets and opportunities to engage buildings owners and ultimately inform climate priorities for Chicago's built environment. For example, Chicago may want to consider including the type and amount of refrigerant purchased for some building types, which will provide valuable data to understand the carbon emissions from buildings due to leakages.

Recommendation 9 (POLICY) Building off of the City of Chicago's Energy Benchmarking Ordinance, the City should adopt a Building Performance Standard that establishes energy performance targets for most existing buildings, and provide voluntary and incentivized options for the smallest properties not covered by the ordinance.

A Building Performance Standard (BPS) requires direct action by building owners to meet city-mandated performance improvement targets for their property, and are a growing policy trend and cornerstone of climate action plans. Energy reduction targets established by the BPS typically become stricter over time, thereby driving continuous, long-term improvement in the building stock. In the United States, most policies involve commercial and multifamily/rental buildings, but European and Canadian cities have been more willing to also address single family homes.

The Working Group urges the development of a BPS that is performance-based and not prescriptive, allowing building owners broad flexibility to make improvements that make the most sense for their specific circumstances. The BPS should mandate performance targets for larger buildings that are also required to report their energy consumption via the Chicago Energy Benchmarking ordinance, and provide voluntary performance targets for single family, multifamily buildings and small businesses under 50,000 square feet which is the current threshold for the energy benchmarking ordinance. This ordinance should be directly linked to its benchmarking counterpart and apply to the adopted square footage threshold requirements for all building types that are required to report their annual energy usage.

Further, the Working Group recommends a phased implementation that ramps up over time to cover deeper retrofits and more buildings as determined by modeling and studies. This tiered approach can segment properties by type and could include the following sectors/sub-sectors:

- Residential: Single family, small multifamily, mid-size multifamily, large multifamily
- Commercial: small, mid-size, large
- Industrial
- Healthcare
- Religious Facilities
- Institutional/Higher Education
- Municipal Buildings

A successful BPS in Chicago should be coordinated and aligned with the Chicago Energy Benchmarking Ordinance, and further, should include technical and financial tools for building owners, while equipping tenants that are responsible for utility bills with actionable tools that support performance goals. By setting long-term targets, a BPS provides the commercial real estate market with the certainty it needs to make confident investments in properties over time, creating large opportunities for the expansion of private firms offering architectural, engineering, construction, equipment sales, and installation services. Lastly, expanded timeframes along with supportive technical and financial mechanisms can enhance the equitable implementation of a BPS.

Recommendation 10 (ACTION) Urge other taxing bodies to protect building owners from property tax increases related to clean energy upgrades and support protecting tenants from bearing the direct costs of clean energy upgrades.

In many government-funded building improvement programs, building owners are discouraged and sometimes explicitly not allowed to pass on costs to their tenants. This fundamental principle should be embraced by the City as well, and the Working Group urges the City to make it a practice not to increase property taxes as a result of clean energy upgrades. A number of cities including Pearisburg, VA, Winder



Chicago is home to many distinct building types, such as two-flat homes.

GA and Warwick, RI exempt the addition of renewable energy upgrades as part of the property valuation, although some require the owner to actively apply for the exemption.¹⁹ Paired with federal and state tax rebates for installation of clean energy improvements, these assurances can further support the uptake of site-specific clean energy improvements with lasting emission reductions. Further, they help make the installation of renewable energy systems more affordable for the long term, and do not lead to further disparities between neighborhoods.

Recommendation 11 (STUDY) Conduct a building segmentation and characterization study that will inform energy efficiency, renewable energy and other clean energy building improvements.

Chicago is home to many residential, commercial, institutional and industrial sector buildings

characterized by numerous sub-sectors within, structures that are a century old to brand new, all with general energy performance expectations based on both the building itself and the people occupying them. The City should work to better understand the typical performance of common building types, and use that information to advocate for and develop targeted clean energy incentives. Completion of this kind of study will allow building owners to make informed choices about the technical assistance and opportunities available to them, and result in deeper impact and results. For example, the City of Chicago is currently partnered with the U.S. Department of Energy and other local partners to examine the energy savings potential for the five most common residential home types in Chicago. This project combines modeling data and research with a year-long demonstration project across ten homes and five different building types.

¹⁹ "Property Tax Exemptions for Renewable Energy Systems." Sustainable Development Code (report and compilation of best practices in sustainability codes and ordinances), Chapter 7.5 Energy Conservation and Efficiency <https://sustainablecitycode.org/brief/property-tax-exemptions-for-renewable-energy-systems-4/>

Because the project is modeling some of Chicago's most common home types, it is anticipated that the findings will offer a glimpse of the potential impact if implemented at scale across the entire city. Additionally, it can help program implementers be sure they are targeting the most appropriate energy improvement strategies for Chicagoans that will move the needle most towards achieving our aggressive climate goals. This study and other sector-based studies like it are very useful for large cities with many different building types and characteristics.

Recommendation 12 (ACTION) Develop a heat pump pilot project to emphasize and encourage the adoption of new but proven technologies, while considering other emerging technologies for pilot projects.

Advanced technologies are a key to building decarbonization efforts, particularly when transitioning from fossil fuel-based heating. However, the availability of technology alone may not be enough to encourage broad adoption. The City should consider developing a pilot project that serves to demonstrate the attributes of heat pump technology, particularly in the residential sector where residential space heating results in 60% of a household's total energy use each year. Heat pumps are powered by electricity and heat homes more efficiently than their fossil fuel counterparts, while also doubling to provide cooling in summer months. A pilot program could provide hands-on, on-the-ground information across a range of housing types that Chicagoans are already familiar with, while conveying that recent technology advancements make heat pumps a viable solution in cold weather climates. It should also address related technologies including heat pump water heaters and clothes dryers as well. The City of Seattle paired a pilot project to convert homes that use heating oil to air source heat pumps by implementing rebates, as well as introducing a heating oil tax. The funds raised from the levied tax are used to support the conversion program and other climate strategies.²⁰ A pilot project of this nature would be focused on

informing Chicagoans of both the mitigation and resilience benefits of heat pump technology, identify the financial levers and potential for utility incentives needed for broad uptake, and highlight key workforce development opportunities and contractor readiness.

Recommendations Section 3:

Build, develop and support the social, financial and technical resources that result in a self-sustaining clean energy economy.

The broad uptake of building decarbonization strategies in buildings across Chicago will be most successful when supported by a range of programs that alleviate barriers to implementation. These include providing financial incentives and mechanisms that reduce upfront costs, offering a range of technical assistance and educational opportunities that prioritize historically under resourced communities and businesses, and ensuring that Chicago's workforce is adequately trained for decarbonization work across building types. There are ten (10) recommendations in this section.

Recommendation 13 (ACTION) Develop a Building Decarbonization Hub and corresponding decentralized "community hubs" in priority neighborhoods.

Efforts to engage building owners in order to provide technical assistance and guidance on financial incentives have served Chicagoans for quite some time, but the uptake of building retrofits has only scratched the surface, and is nowhere near the scale needed for Chicago to achieve its climate goals. Limited resources, outreach, education, staff, technical assistance and financial incentives hinder the broad uptake of energy efficiency and renewable energy upgrades by building owners. For deep penetration across residential, commercial and institutional sectors, Chicago should develop centralized resources similar to those in other cities like the Building Energy Exchanges in New York

²⁰ "Seattle's Heating Oil Law," City of Seattle Office of Sustainability and Environment, <https://www.seattle.gov/environment/climate-change/buildings-and-energy/seattles-heating-oil-law>.



City²¹, St. Louis²² and Kansas City²³, Washington D.C.'s Building Innovation Hub²⁴, and the Building Energy Retrofit Resource Hub in Boston²⁵. The Working Group supports the development and implementation of a new centralized building decarbonization resource and data hub that is focused on providing tools, guidance and resources for building owners and operators, renters/tenants and communities in the areas of energy efficiency upgrades, renewable energy, project financing and other strategies leading to reduced carbon footprints and net zero building emissions. In addition to the centralized resource, the City should also lead in the support of a community-based hub/location network to provide more localized outreach and assistance as a trusted resource within the community, serving as the key conduit reaching buildings and individuals most in need of support. Both the central and neighborhood hubs should also

focus on the myriad of co-benefits that would go into this work as well, including working with existing small businesses and community anchor organizations, workforce development opportunities, and improved community health outcomes.

NYC Accelerator²⁶ provides training, financing and other resources in advance of a law that will cap the amount of emissions a building can emit. Washington DC's Building Innovation Hub²⁷ helps building owners interpret building codes and performance standards, and identify helpful resources and qualified contractors. Developing a similar "Hub" in Chicago will necessitate understanding the scale of need in our communities.

21 Building Energy Exchange (BE-Ex), <https://be-exchange.org/about-us/>.

22 "In Missouri, resource hubs aim to help building owners improve efficiency." Energy News Network. October 7, 2021. <https://energynews.us/2021/10/07/in-missouri-resource-hubs-aim-to-help-building-owners-improve-efficiency/>

23 Regional Building Energy Exchange, Climate Action KC, <https://climateactionkc.com/solutions>.

24 Building Innovation Hub, <https://buildinginnovationhub.org/>.

25 Building Energy Retrofit Resource Hub, City of Boston, <https://www.boston.gov/departments/environment/building-energy-retrofit-resource-hub>

26 NYC Accelerator Program. <https://www1.nyc.gov/site/nycaccelerator/index.page>

27 Building Innovation Hub. <https://buildinginnovationhub.org/>

Recommendation 14 (ACTION)
Form a Green Bank for Chicago.

Financial constraints and access to capital remain one of the biggest barriers to large and whole-building energy improvements for both owners and contractors. According to the Coalition for Green Capital, “Green Banks are mission-driven institutions that use innovative financing to accelerate the transition to clean energy and fight climate change.”²⁸ They have emerged as a viable solution, and their purpose is to ensure that financing mechanisms are in place and accessible, particularly to homeowners and small and medium-sized business owners (i.e. many landlords), affordable housing developers and nonprofits.

The Working Group urges the formation of a Chicago Green Bank to increase capital access for decarbonization projects, especially in historically marginalized communities in Chicago. Its location, structure, initial capitalization size/source all need

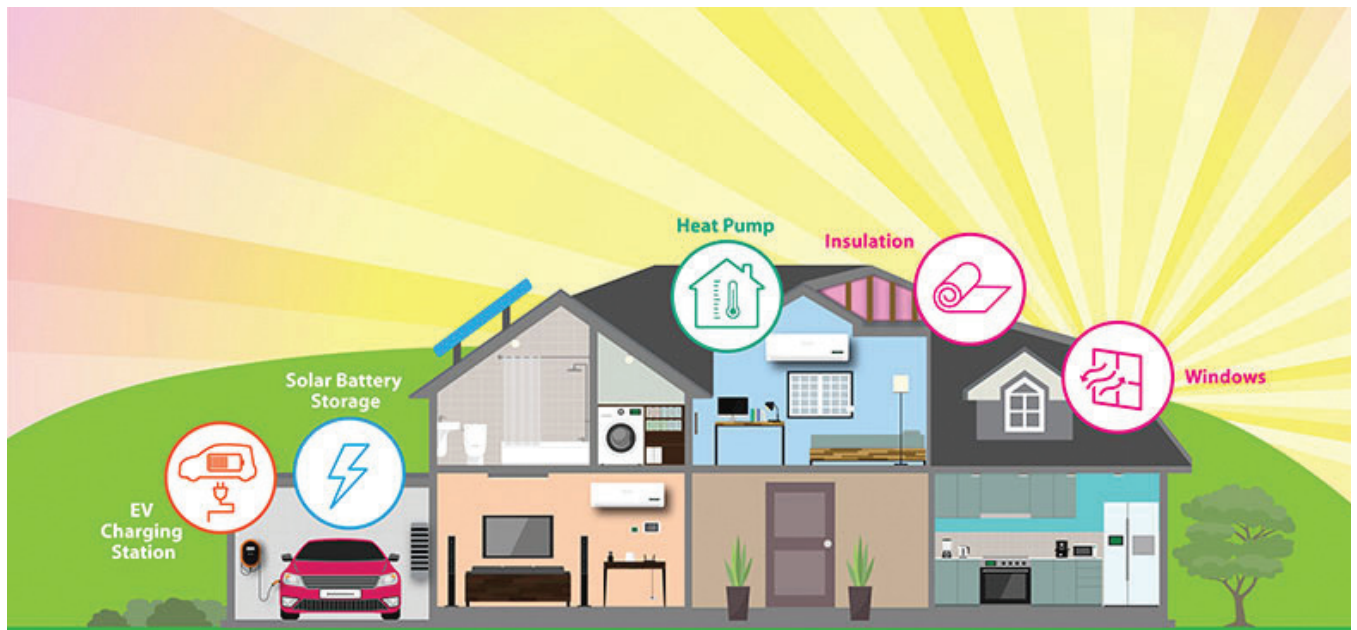
to be studied in detail, along with a financing gap analysis and should be in alignment and coordination with the green bank structure that will be established as a result of statutory requirements of the Climate and Equitable Jobs Act (CEJA), the recently passed state energy legislation. With most financing products, certain borrowers are not provided access to affordable financing opportunities, with rates too high or credit requirements that result in rejection of financing. A green bank will solve this barrier reducing the cost of capital through a variety of proven techniques, including but not limited to credit enhancements, co-investments, and on-bill financing. The city should work with the Coalition for Green Capital²⁹ and local institutions to write this business plan, similar to how North Carolina approached its Green Bank formation.³⁰

The green bank would complement rather than replace these existing programs and create new financing products that “fill in” these gaps. Lastly, the green bank will serve as an intermediary between the capital markets and local financial

28 “What is a Green Bank,” Coalition for Green Capital, <https://coalitionforgreencapital.com/what-is-a-green-bank/>

29 Coalition for Green Capital, <https://coalitionforgreencapital.com/>.

30 North Carolina Clean Energy Fund, <https://www.nccleanenergyfund.com/>.



Connecticut’s Green Bank has invested over \$2 billion to accelerate inclusive, clean energy investments, including its “Smart E-loans” program for homeowners. Source: Connecticut Green Bank

institutions. The green bank would work to bring other new investment sources into Chicago and also seek federal funding and tap into new resources made possible by the recent passage of CEJA, which includes the direct creation of a Green Bank and the establishment of an environmental justice grant program that will initiate funding targeted for disadvantaged businesses.³¹

Recommendation 15 (STUDY) Conduct a study to better understand the viability of Property Assessed Clean Energy (PACE) financing and other low-cost green loan structures.

Property Assessed Clean Energy (PACE) financing is often heralded as a solution for building owners that can benefit greatly from clean energy improvements but lack the upfront capital to implement. Chicago building owners have access to two PACE programs, Chicago PACE and the Cook County Commercial Property Assessed Clean Energy program (CPACE) that are primarily available for commercial building owners, including multifamily residential. PACE programs are an advantageous tool because the typically high cost of installation is tied to property valuation and allows the improvements to be paid over time with the cost savings incurred by the energy savings, instead of required expenditures at the time of installation. However, in some places PACE remains out-of-reach for many, and some instances in other areas have earned a reputation of being predatory programs that can hurt building owners financially.

The Working Group supports further study of PACE and other low-cost green loan structures to better understand how they might be improved and/or which ones are the best fit to meet the needs of Chicago building owners. Barriers noted for other PACE programs have been program administration issues, predatory contractors and higher interest rates, particularly as it pertains to residential PACE programs, which do not currently exist in Illinois. This study could also provide specifics about both Chicago and Cook County's PACE programs that are

still relatively new to our area and offer suggestions to broaden their penetration across Chicagoland.

Recommendation 16 (ACTION) Provide historically underserved communities with deep, local and inclusive engagement efforts that result in broad participation of energy efficiency, renewable energy and electrification strategies and incentives.

To reach those who are least equipped to implement these strategies but would benefit the most from, the Working Group urges the City of Chicago to engage Chicagoans who may only have a limited working knowledge (or none at all) around the climate actions Chicago seeks to emphasize. In addition to providing financial and technical assistance in accordance with several policies and actions in this set of recommendations, the Working Group proposes that City-branded guidance also be developed for building owners and tenants on the range of climate actions they can take personal responsibility for, and the anticipated benefits for doing so.

Numerous existing incentives and opportunities exist to help building owners in all sectors reduce energy consumption, gain access to renewable energy, and most recently, to transition to non-fossil fuel space heating and cooking. Chicago can advocate for targeting these resources and the development of new incentives in key communities to ensure that energy benefits are reaching our frontline communities.

- Support/enhance the adoption of utility programs
- Support additional incentives for housing providers to complete energy efficiency investments, in both residential and commercial properties
- Secure funding to address health, safety and other code issues within buildings that currently preclude many clean energy programs
- Choose pilot neighborhoods to target “reserved incentives”
- Help buyers purchase spaces and/or equipment

³¹ SB2408 Bill Fact Sheet, Illinois Clean Jobs Coalition, https://ilcleanjobs.org/wp-content/uploads/2021/09/SB2408-Bill-FactSheet_-9.9.2021.pdf.



◀ Energy experts talk with a Chicago homeowner to learn how they can best address her energy needs.

- that support decarbonization goals
- Develop centralized portal for City-branded literature and primers on “How (and Why) to get to Carbon Net Zero” primers from a variety of perspectives and sectors (design and construction; home-buyer; etc.)
 - Provide guidance for building owners on realistic planning and cost-shifting to achieve energy performance targets and goals
 - Provide aggressively simple decision points for all sectors, such as electricity vs gas; electric service provider options; appliances; transportation options; resource providers and vendors
 - Advocate for stronger incentives across less expensive energy-saving measures (e.g., ceiling fans)
 - Investigate opportunity to develop bulk-buy purchasing so that Chicagoans can benefit from discounted energy efficient equipment and appliances

Recommendation 17 (ACTION) Seek out state and federal funding to develop resources and fund the work.

The City of Chicago’s decarbonization goals align with both state and federal funding opportunities that are emerging. Illinois’ recent passage of the Climate and Equitable Jobs Act, as well as the Biden

Administration’s American Rescue Plan Act (ARPA) and the Justice40 initiative, which sets a goal to deliver at least 40% of the benefits of from federal investments in climate and clean energy to disadvantaged communities, results in an unprecedented alignment of governmental funding and policy priorities. Equally, if not more important, climate science has evolved, and today’s best practices result in greater, deeper impacts than ever before. The time to act is now. Given the intended targets of both state and federal climate commitments, Chicago is well-positioned to benefit from them. The impetus is on Chicago to seek and obtain that funding, including indirect support provided by other agencies as a result of governmental priorities, such as increased utility-sponsored programs.

Recommendation 18 (ACTION) Seek support from public and private philanthropy

Cities like Chicago benefit from a large concentration of corporate and philanthropic organizations, many of whom are willing to be a part of solution-building for a stronger, resilient Chicago. The City of Chicago should work to organize communication and efforts to garner support towards a common goal; recruiting local

Two solar trainees learning valuable skills for the clean energy workforce. ▶



leaders to take the lead in bringing together local and national funders to support it. Seed funding, ongoing funding in targeted, under-resourced communities, and other opportunities could all be attractive partnerships to these kinds of organizations, and are worth pursuing.

Recommendation 19 (ACTION) Develop and support multiple workforce development, career development and small business development trainings related to the growth in “green jobs” already occurring and expected to occur as the built environment embraces decarbonization. Further, target participation in historically marginalized communities as an avenue for building community wealth.

Numerous, disparate workforce development training programs tied to clean energy exist in Chicago, particularly in the construction industry, and are very much focused on renewable energy installation. However, with the City’s climate and building decarbonization goals in mind, this desired community-wide level embrace of strategies could not be supported by the current number of contractors available to do the work. Construction workforce needs to be trained on electric upgrades and enhancements, air source heat pump

installation, solar installations (onsite and offsite), and other advanced clean energy technologies. This represents a significant opportunity for job growth and development that can benefit underemployed and unemployed Chicagoans while building skillsets that are transferable across employers. Beyond job training, furthering that pathway into emerging small construction business opportunities could prove to be advantageous as well, with increasing opportunities around smaller scale residential retrofits. The Working Group urges the City to forge partnerships with existing workforce development organizations, labor unions and their respective apprenticeship programs, builder/developer industry groups, City Colleges of Chicago, trade programs in Chicago Public Schools, and community organizations in order to develop a cohesive approach that allows Chicagoans to capitalize on the nation’s green job growth outlook.

Recommendation 20 (ACTION) Develop and sustain robust external-facing training on construction and zoning code requirements.

Directly connected to City code, the Working Group urges the City to develop and implement training on construction and zoning code requirements that



An energy analyst explains what he's seeing to a multifamily building owner during an energy audit.

address the technical requirements as well as the rationale for said requirements, that will ultimately translate in to a better understanding of code and adherence to it. The training should be designed for both professionals (designers and contractors) as well as individual building owners seeking to perform their own work. Training materials and programs should emphasize plain language and language access, recognize different learning styles (aural, visual, hands-on, etc.), videos for later viewing and provide opportunities for both established professionals and newcomers. Access for members of historically underrepresented groups should be a priority. The training could be reinforced or funded by making it a condition of obtaining or renewing certain construction-related licenses.

Recommendation 21 (ACTION) Develop a building decarbonization directory of vendors, products and service providers that is accessible to the public.

Two of the biggest hurdles in getting people to

engage with energy-related initiatives (besides costs) are knowing who to talk to about the program and getting the information they need to make decisions. People are more inclined to get involved in decarbonization if the information they need to get started is readily accessible, which includes finding the vendors that offer the products and services they need.

A public directory can help:

- Direct people to vendors, especially those who identify themselves as early adopters or ready/decisive customers.
- Provide another layer of familiarity for vendors that may also be involved in demonstration projects and communications about the projects.
- Encourage utilities, building owners, industry associations and capacity building organizations to connect with emerging, small, or niche businesses providing products and services.
- Map vendor locations, products, and services across the City of Chicago, providing information about accessibility and accountability to be

reported against equity metrics and goals.

- Connect people with resources to obtain or donate salvaged and recycled construction materials

Recommendation 22 (STUDY) Create a just and equitable economic transition plan for the fossil gas industry in Chicago, which will be impacted by these decarbonization goals.

Chicago's decarbonization goals will lead to a significant decrease in reliance on fossil fuels, eventually impacting the fossil gas utility. This transition over time will impact the entire industry. It is imperative that the City understand these ramifications and prepare for them. For example, as an increasing number of former customers transition to other sources of heating their homes, how does that impact costs for remaining customers? As net profits decrease and employees are inevitably reduced in size, how can the City support workplace transition into other areas? Moreover, how will these "stranded assets" perform with fewer employees? The City should consider scenario planning that investigates these situations and aims to develop just transition strategies that ease the mass transition from fossil fuels. It will be imperative to monitor and understand utilities going through this process, and intervene when necessary to ensure residents are not unduly burdened by the transition.

Recommendations Section 4:

Fund and prioritize equitable community engagement that cultivates resilient partnerships and advances hyperlocal benefits.

The work ahead to engage stakeholder groups and the broader public on the City's decarbonization efforts will require sustained support for continuous engagement and collaboration. The theme of "how do we engage all" often surfaced in the Working Group sessions, indicating the importance and awareness around how decarbonization policies and actions may affect various stakeholders and their level of involvement

as it is implemented. Outreach and engagement efforts should be crafted to intentionally balance trust repair and trust building with timely action and cross-sector collaboration. There are four (4) recommendations in this section.

Recommendation 23 (ACTION) Develop an equitable outreach and engagement plan that prioritizes repairing, building trust, and investing in communities that have not been engaged in or informed about decarbonization initiatives, and creates pathways for strengthening relationships among stakeholders for coordinated and diverse cross-sector collaboration.

Activities the plan should include:

- Develop and state the vision and level of ambition of future engagement and review previous engagement efforts for gaps and opportunities that could inform the current plan.
- Incorporate an equity lens and equity-based metrics into outreach and engagement plans.
- Consider perspectives of other often underserved groups such as aging populations/seniors, disabled and low income communities
- Define, map, and learn more about stakeholder groups to understand their relation, involvement, and perspectives on decarbonization efforts. This includes identifying stakeholders that may have been lightly touched or overlooked in previous efforts and understanding how to engage them, which could include groups like youth coalitions and BIPOC-led trade organizations.
- Establish a resilient support structure for trusted messengers and partners that can maintain and streamline communications and operations activities. The support structure is the mainline for dialogue and conducting business with the City. Communications and operations systems should be budgeted for, thoughtfully built out and regularly maintained. This ensures that trusted messengers and partners have timely, relevant and accurate information about decarbonization goals, active projects, funding opportunities, procedures for payments and invoicing, and educational workshops and convenings to sustain deep involvement.
- Convene community-based trusted messengers, partners, city departments, sister agencies

and new stakeholders to understand trust and relationships, and as applicable discuss what trust repair and trust building could look like in their community or sector. This conversation is relevant for the City rebuilding trust and will require active listening in order for the City to understand how other actors may have harmed stakeholders and how that harm may underlie hesitancy to engage in carbonization efforts (e.g., customer experiences with alternative energy suppliers).

- Understand how non-energy, non-decarbonization priorities may take precedence and may be pervasive among select stakeholder groups, and how that might be addressed through a suite of services. For example, building owners serving communities with low to

moderate incomes may have limited capacity and cash flow for decarbonization related efforts. For these situations, care must be taken to provide high levels of technical and financial resources.

- Compose a community orientation program that introduce and educate the public on decarbonization goals, programs, tools, technical assistance, financial incentives and other relevant information that can encourage engagement in decarbonization initiatives. There should also be a keen focus on how and where people gather, such as community centers and places of worship, and how the orientation program might integrate with the current programming or be introduced in the space.
- Continue to connect decarbonization outreach and engagement to other strategic initiatives such as INVEST South/West and the Chicago Climate

Groundswell, a nonprofit organization with a focus on community solar projects, partnered with The Renaissance Collaborative, a 30-year old community based organization in the Bronzeville neighborhood, along with Elevate and the Mohawk Group to develop a Smart Flower™ “solar flower garden” that can produce clean energy for homes and businesses.



Action Plan.

Recommendation 24 (ACTION) Leverage cross-sector relationships to develop nuanced, multi-disciplined partnerships and funding opportunities.

The City is strategically positioned to connect public, private, nonprofit, and community-based organizations on decarbonization efforts. The City should aim to leverage existing relationships and provide a forum for emerging, small, or niche organizations to connect with well-established organizations that hold significant power and influence in energy and building-related initiatives. The Working Group urges the City to facilitate meaningful and productive connections between small businesses, M/W/D/BE contractors, building owners with city agencies, utilities, trade associations and unions, manufacturers, developers, utility or building program administrators, and capacity-building organizations. The facilitation of power sharing in relationship development will be critical to building cross-sector collaborations that can help materialize decarbonization programs and benefits across the cityscape.

Nuanced cross-sector relationships will create new opportunities and approaches to decarbonization projects, attracting funding, talent and technologies for scaling up. Equitable approaches to accessibility of capital, talent and technologies for community-based organizations and for emerging, small and niche businesses must be a priority for advancing the entire city on decarbonization goals. The groundwork will be laid for a new edge in innovation, which will make Chicago more competitive as transformational funding opportunities continue to emerge (e.g., MacArthur Foundation's \$100 million challenge) via private foundations, private investment, and local, state and federal funding opportunities. Transformational opportunities often require nuance, innovation and diversity; thus, it is critical that organizations remain committed and active in their pursuit of the City's decarbonization.

Recommendation 25 (ACTION) Strategically invest in demonstration projects.

Demonstration projects are an opportunity to shape collaborative partnerships between public, private, nonprofit and community organizations, and focus on innovative approaches to decarbonization. By implementing demonstration projects, the City may ascertain the timeframe, partnerships, and investments that could be required to scale a decarbonization measure or approach. When projects are successful, the City should prioritize understanding and crafting outreach, engagement and funding strategies that accurately describe stakeholder-relevant benefits and returns on investment for those who may be hesitant to engage, participate or invest in decarbonization initiatives.

Decarbonization demonstration projects in Chicago will require an investment of time and money, and there should be an effort to invest just as much if not more social capital to forge new partnerships. While planning and developing demonstration projects, the City should consider the following activities:

- Leverage demonstration projects as opportunities to directly engage local M/W/D/BEs and provide training opportunities that can be promoted through and filled by participants in workforce development programs. If projects are chosen to scale or approaches are selected for implementation across a building type (e.g., new construction), the workforce will be trained and available to meet the demand for the required skills and technical capability.
- Engage with trade unions at the onset of demonstration project development. They are familiar with technical competencies and may inform the level of capital investment for such projects.
- Develop public education campaigns to communicate the value and benefit of decarbonization as framed within the outcomes of demonstration projects. Case studies, communiques, and educational programming

are essential to broader awareness and uptake in decarbonization initiatives, and should be well planned, budgeted, and resourced.

- Work with utilities and local commercial businesses to fund and support early local demonstration projects.
- Work with philanthropic organizations following the lead of the project partnership if they are interested in funding projects.
- Target community scale demonstration opportunities such as the Smart City Program at community area scale.

The City of Chicago is currently partnering with the U.S. Department of Energy, the National Renewable Energy Laboratory, ComEd and Chicago-based nonprofit Elevate in a 10-home demonstration project that aims to prove that the typical Chicago home can reduce energy consumption by more than 50 percent with proven technologies that are widely available today. Retrofit construction is expected to be completed in summer 2022.

Recommendation 26 (ACTION) Fund and support the broad expansion of community solar and central community systems, other onsite/offsite renewable energy systems, and related resilience measures to advance a successful clean energy transition.

Not every building in Chicago is suitable for onsite renewable energy due to building or site-specific conditions, the owner's financial ability or other reasons. This does not mean that the building owner's or renters are unable to capture the benefits of renewable energy. Both community solar arrays and centralized district-scale distributed energy systems offer designated or nearby subscribers a chance to tap into the benefits of these systems. Currently, this technology exists, but it is contingent upon the right mix of partners, developers and sometimes—seed funding. Chicago

should consider identifying appropriate public and private opportunities to engage partners for these kinds of ventures. It may be particularly advantageous to do so during the development or redevelopment of a building.

These efforts will also necessitate outreach and engagement that demonstrates tangible change in communities. The City can help close gaps in solar education and capital accessibility for building owners, and gaps in community-wide education so that such efforts can cover the geography and solar education content necessary to move the needle further on community solar. The City may also work with established businesses and institutions on demonstration projects, large-scale installations, community partnerships and curated dialogue on how to sustainably expand renewable energy options throughout the city.

For example, the Illinois Medical District (IMD) on the near west side is currently re-examining its master plan to better infuse sustainability elements into its future plans. Chicago and the appropriate agencies within City Hall should consider conversing with IMD leadership on whether they might be opportunities to build a partnership in district scale energy or renewable energy systems, while searching for other opportunities like this – all of which could serve as an example for future similar endeavors.

The City should leverage existing partnerships and programs, and consider funding and supporting additional community-based education efforts that increase awareness of the benefits of community solar; supporting resilience measures to ensure access to jobs, funding, and infrastructure maintenance for community solar projects, district energy systems and other resilience projects in disinvested communities; and facilitating cross-sector partnerships that can demonstrate innovations in solar and accurately represent the costs and benefits that can inform broader uptake of these types of projects.

Next Steps and Strategic Process

The recommendations in this report were developed in a consensus-driven process by the Chicago Building Decarbonization Policy Working Group over many hours of conversation during the summer of 2021 that included large joint meetings, smaller focus group discussions, and additional support with hours of research by small groups and individuals. Additionally, the Working Group also utilized the initial best practices research that was conducted in 2020, which came from the growing body of decarbonization policies and programs emerging in other cities. The City of Chicago Office of Sustainability is grateful for the dedicated service of the Working Group and looks forward to moving these ideas forward from conception to implementation.

Next steps including the following:

- 1. Presentation of Recommendations to City (2022).** Upon report completion and in partnership with the City of Chicago Office of Sustainability, the Chicago Building Decarbonization Policy Working Group presented its recommendations to a selection of City staff and officials, with support from Chief Sustainability Officer Angela Tovar.
- 2. Ongoing Stakeholder Conversations (2022 and Onward).** After nearly a year of stakeholder meetings and the intensive series of Working Group meetings, one element that has been uncovered is the ongoing need for continued conversations. Many sub-sectors will require continued engagement on targeted topics in order to build support, identify and address additional technical gaps, and generate interest and awareness across the many stakeholders

connected to multiple building sectors/sub-sectors. These ongoing conversations will be vital in continuing to build alignment, establish new partnerships, and grow an already robust network of stakeholders that will help advance our goals for an equity-centered building decarbonization strategy in Chicago.

- 3. Policy + Program Development and Implementation (Ongoing).** This report features 26 recommendations. Each policy will likely have its own timeline for further development and adoption. Actions and studies will require careful implementation planning to identify implementation agencies/partners, funding source, program metrics, and desired outcomes. Some recommendations are already gaining traction within existing City programs and strategic partners community partners. To track progress, the Working Group recommends an annual status update memo on the recommendations outlined in this report.

While building electrification has promising benefits for residents, it must be pursued equitably— ensuring that environmental and social justice communities can benefit, rather than being left with polluting and increasingly expensive gas appliances. It will require intentional policymaking and a planned transition for environmental and social justice communities to gain access to the major benefits of electrification, including cleaner air, healthier homes, good jobs and empowered workers, and greater access to affordable clean energy and energy efficiency to reduce monthly energy bills.”³²

– Equitable Building Electrification: A Framework for Powering Resilient Communities by The Greenlining Institute and Energy Efficiency for All

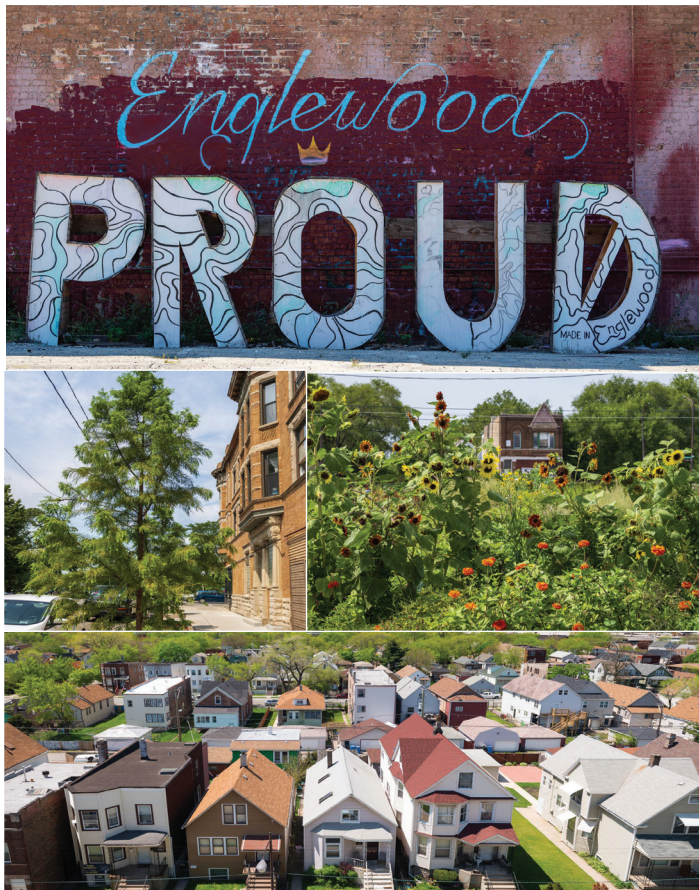
³² Equitable Building Electrification: A Framework for Powering Resilient Communities. September 2019. The Greenlining Institute and Energy Efficiency for All. <https://greenlining.org/publications/reports/2019/equitable-building-electrification-a-framework-for-powering-resilient-communities/>

Conclusion

When the Chicago Building Decarbonization Policy Working Group convened in 2021, the stated outcome was to deliver recommendations to the City of Chicago that will inform a strategic approach to significantly reducing emissions in the built environment for all of Chicago's communities. The City charged the Working Group to use an equity lens to ensure that all policies and recommendations outlined in the report will be a critical to guarantee that the deep benefits for Chicago's historically underserved black and brown communities are prioritized.

Chicago is home to many communities on the frontlines of the climate change that have worked

tirelessly for decades on campaigns and organizing efforts that seek to alleviate environmental harms, promote improved air quality, create green jobs and wealth generation opportunities and create an overall just transition to a just and equitable climate future. Chicago is uniquely positioned to accelerate the transition of our communities by aligning its historical climate investment, through the 2022 Chicago Recovery Plan, with funding and policy priorities at every level of government, including the Climate and Equitable Jobs Act and the Bipartisan Infrastructure Law, among others. As the climate crisis continues to threaten our communities, we urge the City of Chicago to act aggressively and tactically to reduce emissions, reduce energy insecurity and create more opportunities for inclusive economic growth.



Thank you to the many stakeholders who shared their expertise, perspectives and a tremendous amount of insight as members of the Chicago Building Decarbonization Policy Working Group, and the Project Team Members who conducted ongoing research and provided administrative support and facilitation for the Working Group.

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TERM	DEFINITION
Carbon Dioxide (CO ₂)	A naturally occurring gas that is also a byproduct of burning fossil fuels, burning biomass, deforestation, and other industrial processes. The principal human caused heat-trapping (greenhouse) gas that impacts the Earth’s radiative balance.
Carbon Footprint	Total volume of greenhouse gas emissions caused by a community, action, product, or person.
Carbon Intensity	Number of emissions of carbon dioxide released per unit of another variable.
Carbon Neutrality	For the purpose of the plan, Carbon Neutrality will refer to the point at which Chicago’s greenhouse gas emissions reach zero.
Clean Energy	A colloquial term to describe energy sources that have low-to-no direct greenhouse gas emissions. This list includes renewables (solar, wind, and biomass), nuclear, geothermal, carbon capture and storage, hydropower, and hydrokinetic sources.
Clean Electricity	A colloquial term to describe electricity produced from clean energy sources.
(Illinois) Climate and Equitable Jobs Act	The September 2021 legislation adopted by the State of Illinois to commit to reducing emissions by 45% by 2035, having carbon-free power by 2045, while putting in motion significant and equity-centered funding, jobs and other benefits for Illinoisans.
Commonwealth Edison or “ComEd”	The largest electric utility in Illinois (based in Chicago). ComEd delivers electricity to homes and businesses and manages four million customers across northern Illinois, representing approximately 70 percent of the state’s population.
Decarbonization	Declining carbon intensity over time. The process by which countries or entities aim to achieve a low-carbon economy. The process by which individuals aim to reduce their consumption of carbon.
Direct Emissions	These “scope 1” greenhouse gas emissions occur from onsite combustion or mobile sources that are directly controlled by an entity, such as fuel combustion in buildings (fossil gas, oil) and motorized vehicles.
Embodied Carbon	The carbon footprint of a building or infrastructure project before it becomes operational. The carbon dioxide emissions associated with materials and processes used in building or infrastructure construction.
Energy Burden	The U.S. Department of Energy defines energy burden as the percentage of gross household income spent on energy costs. According to DOE’s Low-Income Energy Affordability Data (LEAD) Tool the national average energy burden for low-income households is 8.6%, three times higher than for non-low-income households which is estimated at 3%. In Illinois, the burden for low-income households is 13%.
Energy Efficiency	Using less energy to provide the same service. Reducing energy intensity.
Energy Intensity	Ratio of energy use per unit of another variable.
Environmental Justice	The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.
Fossil Fuel	Any hydrocarbon-containing materials occurring naturally within the Earth’s crust that can be used as a source of energy through exposure to heat and pressure. The list includes crude oil, coal, fossil gas, and heavy oils.

TERM	DEFINITION
Fossil Gas	A mixture of gaseous hydrocarbons consisting primarily of methane that is formed when layers of organic matter decompose underground over millions of years. After processing, it can be burned for heating, cooking and electricity generation, which contributes to climate change. Also called “natural gas.
Frontline Communities	Communities that are currently and have historically experienced ongoing injustices –including people of color, immigrants, people with lower incomes, and indigenous peoples. These same communities also experience the “first and worst” consequences of climate change.
Greenhouse Gas (GHG)	Any gas that absorbs infrared radiation in the atmosphere. GHGs evaluated in this study include carbon dioxide and methane.
Indirect Emissions	These “scope 2” greenhouse gas emissions that are derived from the purchase of electricity, steam, heat, and cooling, and that occur offsite at the site of generation rather than at a building. However, the ownership of the emissions rests with the organization or person consuming (using) the energy.
Kilowatt Hour (kWh)	The electrical energy unit of measure equal to 1,000 watts of power supplied to, or taken from, an electric circuit for one hour. This is a standard measurement for electricity consumption.
Leadership in Energy and Environmental Design (LEED) Certified and Environmental Design	A green building rating system that provides third-party verification of green building strategies and issues a certificate for meeting a confirmed minimum performance score.
Methane (CH ₄)	A greenhouse gas that is the main constituent of fossil gas. Emitted during the production of fossil gas, coal, and oil.
Metric Ton (tonne)	Common international measurement for the quantity of greenhouse gas emissions. Equivalent to 2,205 pounds or 1.1 short tons.
Net Zero Emissions (NZE)	A building or property that generates or offsets all energy consumed.
Property-Assessed Clean Energy (PACE)	A program created for financing energy efficiency and renewable improvements on private property. Improvements can include energy efficiency, renewable energy and water conservation upgrades to a building. The State of Illinois has passed legislation allowing PACE programs at the municipal and county-level throughout the state. Both Cook County and the City of Chicago have PACE programs in place.
Renewable Energy	Energy sources that have low-to-no direct greenhouse gas emissions and are replenished constantly such as solar, wind, and biomass.
Social Cost of Carbon	The net present value of climate damages (harmful damages expressed as a positive number) from one more ton of carbon in the form of carbon dioxide. Conditional on a global emissions trajectory over time.
Stretch Codes	According to the New Buildings Institute, a stretch code is a locally mandated code or alternative compliance path that is more aggressive than base code, resulting in buildings that achieve higher energy savings.
Therms	A unit of heat equivalent to 100,000 BTUs. This is a standard measurement for fossil gas consumption.

Best Practices Research

The Project Team selected 12 North American cities with established commitments to decarbonization or net zero emissions goals to conduct initial research on their policies and the structure of their decarbonization commitments. Initial cities researched were Boston, Denver, Indianapolis, Los Angeles, New York City, Philadelphia, St. Louis, San Jose, Seattle, Toronto, Vancouver, and Washington DC. Among those selected were east and west coast cities, large and medium-sized cities, those with long climate action track records, and other considerations. The project team met with eleven of those cities for further in-depth research and understanding.”

High-Level Summary of Findings

Based on the initial inventory of best practices and subsequent among peer cities, Table 3 denotes policy components or implementation approaches that may best inform proposed goals/pathways for the City of Chicago.

Table. Best Practices for Chicago to consider.

	Boston	Denver	Indianapolis	Los Angeles	New York	St. Louis	San Jose	Seattle	Toronto	Vancouver	Washington DC
Buildings/Energy Policies & Programs											
New Construction	•	•			•				•		
Energy Efficiency in Existing Buildings	•				•	•	•	•			•
Electrification/ Fossil Gas-Fuel Oil				•			•	•		•	•
Renewables/ District Energy	•								•		
Financing		•		•					•	•	•
Stakeholder Engagement											
Process	•	•	•		•	•		•	•		•
Education & Outreach		•		•					•		•
Equity	•		•	•			•	•	•		•
Implementation											
Interdepartmental Collaboration		•		•							
Partnerships					•			•			
Staffing		•			•	•			•		•
Lessons Learned	•	•		•	•	•		•	•	•	•

New Construction

Many cities have only set preliminary targets or commitments for aggressive energy code adoption for new construction (i.e., “net zero new construction by 2030”), but a few are intent on driving adoption in the more near future (i.e. next five years) for new commercial buildings, but also residential. Boston and Denver plan on driving conversation and efforts toward the adoption of net zero (or zero net energy) requirements. Denver is targeting the adoption of a Green Code, which would include zero net energy requirements for commercial buildings as early as the next code cycle (2023). Alternatively, New York City is considering the adoption of the Passive House standard.

New Construction and Renewable Energy

A few cities have adopted supplemental or secondary requirements to existing code related to renewable energy, for both new residential and commercial buildings. St. Louis, San Jose, and Seattle have all adopted “solar-ready” provisions into their base codes for both residential and commercial buildings. Seattle’s provisions go a step further and require certain buildings to install minimum-level photovoltaic (PV) system installations for new commercial buildings. Similarly, New York City’s Green Roof Local Laws 92 and 94 require that all new buildings and buildings undergoing major roof renovations must be covered with solar panels, green roofs or some combination of the two. There is a requirement to reduce urban heat hazards.

Electrification

City policies for addressing electrification are limited due to significant challenges especially as they relate to fossil gas utility opposition and labor relations in most instances. At the user end, several noted industry-specific and cultural connections to fossil gas that have slowed uptake of broad consideration of electrification. However, Toronto noted that increasingly aggressive performance standards can limit the installation of fossil fuel sourced energy systems, regardless of a fossil gas

ban. Several cities we spoke with experienced significant backlash and marketing campaigns/pushbacks. San Jose (CA) adopted a 2020 law banning fossil gas installations in all commercial new construction, while Seattle is utilizing tax increases on fuel oil purchases to deeply incentivize fuel switching.

Energy Efficiency in Existing Buildings

Commercial/Multifamily

Several cities are targeting existing commercial/multifamily buildings through the development and adoption of building energy performance standards, or alternatively, retrofit/tune-up ordinances. Typically built upon existing energy benchmarking policies, performance standards mandate improvements over time, based on a chief performance metric (i.e., energy use intensity, carbon emissions, ENERGY STAR score, etc.), with recurring compliance and reporting cycles. Building retrofit/tune-ups ordinances typically mandate energy assessments, implementation of operations & maintenance (O&M) improvements, verified corrections, and reporting; on a recurring basis (e.g., every five years). The table below highlights building performance standards and related mandates in Seattle, New York, St. Louis and Washington D.C., each of which establishes required performance metrics.

Single-Family/Residential

There were fewer cities that expressed substantial progress or key achievements in targeting existing single family/residential buildings. Programs and initiatives generally have been limited in practice, due to increasing difficulties or inability to influence through code mandates, as well as affordability concerns. The City of Seattle, however, has been adamant in targeting this group which accounts for roughly half of the City’s building sector carbon emissions, through key initiatives such as their Oil Conversion Promotion (rebate program), supplemented by its passing of its heating oil tax ordinance.

Case Study: Seattle, WA

Energy Efficiency in Existing Single-Family Buildings – Heat Oil Conversions

The City recently supplemented its Oil Conversion Promotion (rebate program), which offers instant rebates to switch to an energy-efficient heat pump, with the passing of its heating oil tax ordinance (effective 2021). Starting in September 2021, heating oil sold in Seattle will be subject to a tax of around 24 cents per gallon. This tax will be imposed on the heating oil service provider, and is assumed that it will be passed on to residential customers. The revenue from the oil tax will be used to help pay for low-income households switch from oil to an energy-efficient electric heat

pump. Households that are not income qualified will still have access to rebates to help offset the cost of switching to a heat pump.

The legislation supports the phase out of home heating oil to more energy-efficient and clean heating and cooling systems by 2030. Heating oil represents 16-18% of total carbon pollution in the City’s residential sector and 9% of carbon pollution in the total buildings sector. The legislation also directs City departments including Office of Sustainability and Environment, Seattle Fire Department, and Seattle Dept. of Construction and Inspections to develop requirements and specifications for heating oil storage tanks to be replaced or decommissioned by 2028.

Building Performance Standards and Building Tune-up Mandates

Seattle	New York City	St. Louis	Washington DC
<p>Building Tune-Up Ordinance (2017)</p> <ul style="list-style-type: none"> All existing commercial buildings 50,000 sq. ft. or larger Required to perform building tune-ups, every five years <ul style="list-style-type: none"> Involves assessment; implementation of operational and maintenance improvements to achieve energy and water efficiency Verified corrections, and reporting by qualified ‘Tune-Up specialist’ Building Tune-Up Accelerator Program* - acted as “carrot” to “stick” of phased in tune-ups mandate; financial incentive for completing tune up prior to mandated deadline Bolstered by increased technical support and trained pool of service providers; provided funding to school district staff to become tune-up specialists 	<p>Building Retrofit Mandate (2019)</p> <ul style="list-style-type: none"> All existing buildings 25,000 sq. ft. or larger Required to meet carbon emission limits, assigned by building occupancy type <ul style="list-style-type: none"> Initial compliance period (2024-2029) limits target buildings with highest emissions intensity levels 2nd period (2030-2034) limits in line with City’s interim emissions reduction goal of 40% by 2030 Formed new ‘Office of Building Energy Emissions Performance’ within Department of Buildings to administer/ implement Provide technical assistance to buildings owners, establish alternate compliance methods, and issue penalties for non-compliance 	<p>Building Performance Standards (2020)</p> <ul style="list-style-type: none"> All existing commercial buildings 50,000 sq. ft. or larger Required to meet energy use intensity (EUI) standards <ul style="list-style-type: none"> Standards no lower than 65th percentile of site EUI for similar buildings in City, every four years Expressed in site EUI to align with City strategy toward future electrification Building Division responsible for implementation; also implement benchmarking program ‘Building Energy Improvement Board’ ensures compliance; develops alternative compliance plans 	<p>Building Energy Performance Standards (2021)</p> <ul style="list-style-type: none"> All privately-owned commercial and multifamily buildings 50,000 sq. ft. or larger Required to meet minimum ENERGY STAR score threshold <ul style="list-style-type: none"> Threshold no lower than the local median ENERGY STAR score by property type, every six years High-Performance Building Hub developed to support owners, developers, builders, and designers in compliance Created a dedicated staff position to further assist affordable housing stakeholders and their compliance

APPENDIX 3 | Summary of Research Findings

Renewable Energy/District Energy

As noted above, St. Louis, San Jose, Seattle and New York City adopted “solar-ready” mandates for new construction, while NYC’s also establishes requirements for buildings undergoing major roof renovations.

Another popular mechanism to provide broad access to the benefits of renewable energy that cities we spoke to cited is Community Choice Aggregation (CCA). CCAs allow local governments to procure and increase investments in local renewable energy and provide affordable and renewable electricity to residents and businesses. CCA programs have been implemented in the cities of Boston and San Jose, and while currently authorized only in CA, IL, OH, MA, NJ, NY, and RI, several other cities indicated strong interest in lobbying for state authorization.

District energy has played a limited role, especially in U.S. cities interviewed. District energy strategies are influenced by local factors for implementation, thus findings from other cities may be limited. The City of Toronto is actively promoting the idea of low carbon district systems (ground source heat pumps/geothermal for heating and cooling). The City’s existing Deep Lake Ontario System also brings in water to provide cooling water services to about 70 buildings in downtown corridor (similar to existing City of Chicago district cooling systems).

Financing

Update Denver Among cities interviewed there was a high range of general and targeted/program-level approaches for providing financial support, as well as mechanisms utilized for funding or generating funds. Voters in Denver recently authorized a sales tax increase (0.25%) that is expected to generate \$30-40M per year to fund sustainability-related projects through City’s Office of Sustainability. The cities of Seattle, Vancouver and Washington D.C. were key standouts, in terms of providing financial support and uptake for buildings/energy policies and programs for existing buildings and/or new construction.

The City of Seattle’s Tune-up Accelerator Program (3-year program funded by the U.S. Department of Energy) funded support for utility tune-up specialists

alongside incentives and saw an extremely high uptake of 25% of eligible buildings; City is thinking of replicating this model for future energy performance standards for commercial buildings (incentives for early compliers, etc.) where funds are managed by utility and receive tax break for providing incentive. In Table 5, the Cities of Vancouver and Washington D.C. are highlighted and feature multi-pronged financial mechanisms to aid in broad uptake of energy programs in multiple building sectors.

Multi-pronged Financial Support Mechanisms

Vancouver	Washington D.C.
<ul style="list-style-type: none">• City Council funds \$4.5M/year• Matching funds for low-income energy retrofits• \$6000 incentive for heat pump installation (about half of total project cost)• \$25,000 for net zero or passive house case studies; single family new construction; for design phase, lessons learned, case study development and publicity	<ul style="list-style-type: none">• Green Building Fund - technical assistance; funding for new construction design assistance• DC. Green Bank - loan and credit enhancements for variety of customer types to fund efficiency and renewable energy improvements• PACE financing - traditional property assessed clean energy financing based on future cost savings• Building Innovation Hub - resource hub for technical assistance and identifying financial resources

Stakeholder Engagement

Among the cities interviewed there was a range of stakeholder engagement activities and commitments. Denver embraced a nine-month process to engage stakeholders on a building energy performance standard, and worked hard to make sure that all voices were represented. Washington D.C. conducted a similar year-long process that involved layers of stakeholders, including a Task Force and Working Groups to unpack various aspects to consider in development of their performance standard.

Numerous cities, Denver included, emphasized the need to “mainstream” climate conversations in order to achieve aggressive climate goals.

Stakeholder Engagement Quips, Tips and Best Practices

St. Louis	Denver	New York City
<p>“In the end, people want to be a part of the solution...if you give them the opportunity to do it, they will, and they’ll go bigger when they can.”</p>	<ul style="list-style-type: none"> • Climate Action Task Force Recommendations report • Highlights extensive stakeholder engagement process • Developed simple fact sheets to distill key information in digestible pieces <ul style="list-style-type: none"> ◦ Overall Emissions ◦ Buildings ◦ Home Emissions 	<p>“We need people that aren’t working on it (climate) every day to care about it.”</p> <p>“Take a step back. Stop being technocrats.”</p>

Toronto	St. Louis	Denver
<p>“We developed ‘climate kits’ so that people could host their own conversations on their own terms.”</p>	<p>“Our four-year compliance cycle came directly from BOMA input; we were surprised, because they had been against benchmarking altogether.”</p> <ul style="list-style-type: none"> • Lesson: Bringing people to the table can create a sense of ownership 	<p>“Don’t ever let a stakeholder wonder ‘Why am I here?’”</p>

Equity Considerations

There is a range of ways that cities are thinking about equity. Among the most intensive analyses are Boston, Seattle and Washington D.C. Boston’s Carbon Free Boston incorporates “equity scorecards” for each major strategic section of its plan and developed a separate supplemental Social Equity Report that provides a deeper analysis of equity impacts connected to climate action and resiliency.

Seattle’s Equity and Environment Agenda serves as the foundational document for how they implement their climate and sustainability initiatives. An Environmental Justice committee comprised of community stakeholders developed the agenda and continues to serve as a standing committee under the auspices of the Office of Sustainability. The City’s Green New Deal and a Racial Equity Toolkit express the goal of ending individual, institutional

and structural racism. Tools and processes embrace a set of questions that guide the development, implementation and evaluation of policies, initiatives, programs and budget issues. Washington D.C. piloted a similar Equity Assessment Tool, with an end goal to operationalize equity across all city policies and programs. A tangible result of earnest efforts is the development of staff person solely engaged in serving affordable housing providers to assist with compliance pathways related to the building energy performance standard. The City maintains a public database of completed Racial Equity Impact Assessments.

These efforts provide examples that Chicago may want to consider not just in the development of its Building Decarbonization Strategy, but also for longer term implementation tools.

APPENDIX 4 | Stakeholder Engagement Key Takeaways

The table below highlights important topics and takeaways that were shared with the Project Team from November 2020 through May 2021 when the team met with hundreds of stakeholders. It should be noted that many of these themes were raised by multiple stakeholders on numerous occasions. These takeaways were informative and were shared with the Chicago Building Decarbonization Policy Working Group at the onset of their work.

About this Process	People/Communications	Policy
<ul style="list-style-type: none"> • Timeline is too short • Timeline is too long • Skepticism regarding • Working Group Process • Is there enough city staff to drive this? • Do you have an engagement strategy with utilities? • Adding stakeholders 	<ul style="list-style-type: none"> • Interest in community level demonstration projects • Underscore importance of education Generational influence – Younger people can influence those older than them, are we thinking about this approach • Engaging those NOT talking about these things – how do we move the needle • We live a high carbon lifestyle here • Importance of trusted messengers 	<ul style="list-style-type: none"> • Build upon benchmarking? • Building energy performance standards • Stretch codes • Local Law 97 (NYC) good, but be careful of pitfalls (fossil gas can be favorable in some cases; punitive can be harsh) • Air sealing is huge, didn't Chicago used to have a robust air sealing program? • Role of carrot vs stick approaches; some places use punitive fines to fund efficiency programs • Some agencies respond well to “carrot” or recognition
Alignment/Related	Equity	
<ul style="list-style-type: none"> • Electricity franchise agreement • Aligning with city departments day-to-day work • Harmonizing with city programs like Invest South/West • Retrofit Chicago • Climate Plan • Electrification of vehicles • Benchmarking; sustainable development code; how do these all work together? • Make whole neighborhoods better • Biden/Harris climate justice initiative • Connections to health impacts • 10-12 different energy tables in Chicago • Intersectionality with brownfield redevelopment? • Universities are potential partners • Is there an intersection of food policy here, perhaps? • Valuating efficiency and renewables at property/site • Are container facilities an option? Perhaps addressing efficiency, reducing those experiencing homelessness • Connection to indoor air quality improvements 	<ul style="list-style-type: none"> • Lead with equity – We want to unpack what that means when we say “lead with equity” • If focusing on electrification, we must consider a just transition for Peoples Gas employees • Should consider an “equity assessment/ scan” at onset • Consider community benefits at onset If energy efficiency is built into rent, then renters need to see those savings • “Equity First” implementation • What is the vetting process for participants in this economy for how profits get made in their neighborhoods? 	

Fossil Gas	Financial
<ul style="list-style-type: none"> • If talking about electrification, must also talk just transition for fossil gas employees • Fossil gas is so cheap, how do we make electric affordable for residents? • Cost of fossil gas over time as we use it less; What does the city need to do to protect consumers and stakeholders? • Some places have done “no gas” for all new construction in a one-size-fits-all approach. Is that a good approach in Chicago, or is phasing \ important? • Very sensitive topic 	<ul style="list-style-type: none"> • Incentives are important • Financial, especially for variety of credit scenarios • Utility turn-offs are an issue • How are funders built into this plan? • Building innovation hub (echoed frequently as something we must initiate) • Seek out federal funding for testing and piloting innovation • Biden/Harris funding opportunities? • Improving PACE to make it more accessible • Is the City planning to identify a revenue stream? • Need other ideas on how to eliminate upfront capital barriers • Revolving loan fund • Must figure out how to engage many more low- to mod- income households • Hitting people with the business case doesn’t matter without technical assistance, other boots on the ground • Address gap between tenants/landlords • Aggregate purchasing • Downtown core is struggling • Recognition is a carrot for some places, especially institutions • Funding for campus settings/portfolio of buildings is challenging

Jobs/Workforce	Other Considerations
<ul style="list-style-type: none"> • Role of labor unions; committed cooperation and commitment to equity • Careers, not just jobs • Entrepreneurial component, not just careers • What are the kinds of jobs will be available, jobs in the past and now? We should publicize widely. • Quality/effectiveness of WFD/ job training • O&M is big role to play, are we training for this? • Are trainings in Chicago keeping up with new HVAC technologies? • Not enough heat pump installers out there, but also, demand is an issue right now; build pipeline 	<ul style="list-style-type: none"> • Embedded carbon, are we thinking about that? • Material Supply Chain • Manufacturing, outside personnel, energy is the next largest cost; this can really resonate • Upgrading the grid: Can all of our current electrification ideas even be supported on today’s grid? Can it even support the tomorrow we want to see? • What is city’s stance on nuclear? • Environmental justice issues – recent actions are off-tone right now. How do we align?

Positive Spins
<ul style="list-style-type: none"> • There are many Chicagoans who love to work together with no financial benefit • There’s people alive who grew up in homes heated by coal - people can and will change • Fossil gas was a real fear factor, but we did it; and we can change again

