Ramping Up Community Building Decarbonization: Planning for Scale, Pace, and Equity at the Local Level

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ABSTRACT

In Washington state the building sector has increased greenhouse gas emissions by 50% since 1990. To meet economy-wide statutory emissions limits, this ecosystem must become net-zero by 2050. Along with Washington state, many local governments are attempting to deliver these reductions at a scale and pace that will require a fundamental shift in building sector outcomes and behavior. In 2023, the City of Tacoma developed a Community Building Decarbonization Strategy (CBDS) with the goal of ensuring a hyper-local, data driven approach to decarbonize the building sector while prioritizing equity and affordability.

This paper discusses the key strategy development methods and their interconnectivity, including the framework and how policies and programs must be designed to quickly ramp up a high-performing building sector ecosystem by 2030; an impact assessment to identify a detailed decarbonization pathway; and an implementation roadmap to establish targets and milestones, timeline phases, strategies, and objectives to inform a final CBDS to deliver equitable decarbonization by 2050.

The final CBDS report emphasizes community-driven actions and the need to collaborate and coordinate policy development and funding strategies with utilities, other jurisdictions and agencies, and Washington state. It includes an approach to deliver on five core elements, including: adopt comprehensive, fast-tracked policies and targets, rapidly transform the market, significantly expand funding and financing, develop implementation capacity and collaboration, and support collaborative utility transition planning.

Introduction

The Tacoma Community Building Decarbonization Strategy (CBDS) (City of Tacoma 2024) provides a data-driven approach to gradually phasing out fossil-fuel appliances and maximizing co-benefits for Tacoma's households and businesses. The CBDS aligns with the City of Tacoma's strategic objectives to become an antiracist, clean energy city with healthy, efficient, and affordable buildings in great neighborhoods. Realizing equitable building decarbonization and maximizing co-benefits will require a high-profile, whole-of-city approach and tight alignment with Tacoma's other strategic initiatives.

Tacoma has many important upstream and supportive plans, policies, and programs in place that are essential for building decarbonization, including but not limited to Tacoma's 2030 Climate Action Plan (CAP) (City of Tacoma 2021) emissions reduction goals and targets, various City resolutions, and programs to address housing affordability and equity, tools, and maps for assessing and addressing inequality within policies and programs. Tacoma also has a municipal electric utility (Tacoma Power) that supplies 100% of the city's electricity and can contribute detailed building stock data, technical analysis, and potentially large-scale

mobilization of programs and other support for building sector market development. Puget Sound Energy supplies natural gas to Tacoma and is a potential partner for efficiency and electrification efforts.

The CBDS is part of Tacoma's larger policy framework to decarbonize its economy. With City Council Resolution 40509 (City of Tacoma 2019), Tacoma declared a climate emergency in 2019 and set a goal for a just transition to a carbon neutral economy for all sectors by 2050. In 2021, Tacoma's 2030 Climate Action Plan identified an economy-wide and sector-level approach to deliver the decarbonization required to meet the emissions limits established by Resolution 40509.

In 2021, City Council also passed Resolution 40776 (City of Tacoma 2021) requiring the City to decarbonize its municipal buildings and conduct an impact assessment of electrifying Tacoma's residential and commercial buildings. The CBDS includes results from the impact assessment directed by Resolution 40776 and uses it to inform a data-driven, equity-focused strategy for how the building sector must transform to meet Tacoma's statutory emissions limits. The impact assessment analyzed the technologies, scale, and pace required to electrify Tacoma's building stock by 2050. It also assessed the energy, non-energy, and cost impacts of this transition.

The purpose of the CBDS is to provide a pathway to reduce emissions from existing and future building stock to meet climate action goals. The CBDS sets a long-term vision with clear near-, medium-, and long-term implementation strategies. The CBDS emphasizes co-benefits and the intersection of climate, housing, public health, and equity. It also includes equitable stakeholder/community engagement in the strategy development and implementation

The CBDS was developed in a multi-step process including granular building sector market and impact analysis and engagement with the Tacoma Building Decarbonization Steering Committee and a stakeholder group. This process informed the development of a 2050 vision for Tacoma's homes and buildings, building decarbonization goals, a three-phase implementation roadmap with targets, and a comprehensive set of strategies and actions designed to work synergistically to meet the roadmap targets. The CBDS is intended to be a bridge from the economy-wide goals and deep community engagement conducted for the Climate Action Plan to an inclusive, whole-of-city building decarbonization campaign to shape and implement the building sector transformation.

2050 Vision for Tacoma's Homes and Buildings

The 2050 vision for Tacoma's homes and buildings is:

Tacoma's homes and buildings are zero-emissions and provide critical infrastructure supporting economic development and an equitable, affordable, healthy, efficient, and resilient carbon-neutral community.

Strategy Goals

The CBDS was designed to achieve the following goals:

- **A Clean Building Transition**. Decarbonize residential and commercial buildings by 2050.
- **Equity and Affordability**. Ensure clean building transition is equitable and affordable.

- **Maximum Co-Benefits**. Maximize co-benefits such as healthy, resilient, and affordable housing and commercial buildings.
- **Workforce & Market Readiness**. Ensure workforce and building sector market have a predictable path to ramp up staff, training, and capacity.
- **Synergy.** Maximize synergies across City departments and initiatives, other jurisdictions, and state, regional, and federal programs and funding.
- **Grid Reliability.** Minimize grid impacts.

Centering Equity & Affordability

Cities are on the frontlines of ensuring equity and affordability in their communities as all sectors of the economy rapidly decarbonize. Decarbonizing the building sector poses unique challenges and opportunities due to potential impacts on housing affordability and the potential co-benefits of providing cooling, improving energy efficiency, reducing energy bills, and removing sources of indoor and outdoor air pollutants such as fossil-fuel appliances.

The CBDS recognizes that decarbonizing Tacoma's building stock by 2050 will require broad and systemic change, and this change must be leveraged to deliver broad and systemic benefits to overburdened and frontline communities disproportionately impacted by climate change, including communities of color, low-income communities, elderly people, non-English speaking households, and immigrant communities. This bold transformation will require support for new investments and targeted, ambitious policy and technology solutions that leverage building decarbonization as a primary mechanism to achieve Tacoma's equity and affordability priorities.

Equity considerations arise in many aspects of building decarbonization. Procedural equity requires inclusive, accessible, and authentic engagement in developing, designing, and implementing building decarbonization programs, pilots, and solutions. Equity needs special attention within building decarbonization efforts to achieve equitable outcomes, including lowering costs, improving health and comfort, and job creation. Conversely, without planning for equity, building decarbonization could have unintended consequences and worsen inequalities by increasing energy burdens or providing inequitable access to new technologies. Solutions should also be developed to recognize and consider the historical and cultural structures that have routinely supported privileged groups in society and resulted in a chronic, cumulative disadvantage for some groups.

By centering equity and affordability, building decarbonization can:

- Increase investment in underserved housing and correct for historic institutional disinvestment in specific communities,
- Improve health, safety, and resilience by targeting and prioritizing unhealthy or unsafe housing for upgrades—addressing ventilation, lead, mold, and structural or electrical issues,
- Develop an equitable workforce through accessible training and certifications to support a transition of the building sector with a focus on job opportunities for marginalized communities, and
- Stabilize neighborhoods by reducing energy costs and unhealthy living conditions.

The following graphic describes the specific steps taken in the CBDS analysis and development to center equity and affordability.

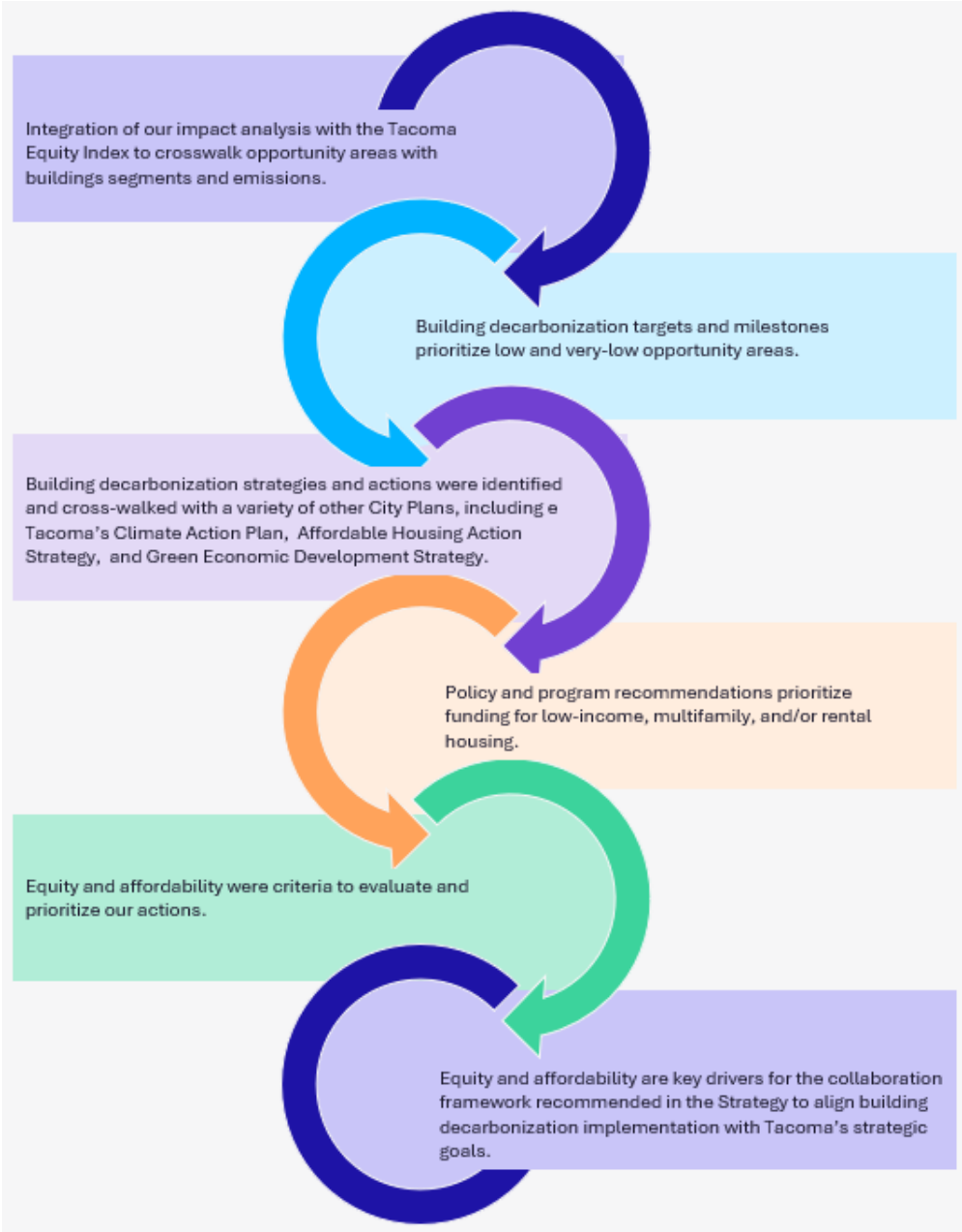

Figure 1. How the CBDS centers equity and affordability. Source: Tacoma Community Building Decarbonization.

Building Decarbonization Pathway

Tacoma Power's fuel mix is 80% hydroelectric and nearly carbon-free (Tacoma Public Utilities 2024). Therefore, at an essential level, decarbonizing Tacoma's building stock requires a phaseout of fossil-fuel appliance installs in new and existing buildings and a transition to zero-emissions appliances. A key factor in developing the most strategic approach to accomplishing this by 2050 is understanding Tacoma's current building emissions landscape, the technical

changes required to reduce emissions, and the scale and pace of those changes. A hyper-local technical understanding of building decarbonization is critical to align policies, programs, market development, and equity protections with the specific scale and pace of building decarbonization in Tacoma.

Current Emissions Landscape

Based on the emissions inventories in Tacoma's Climate Action Plan (City of Tacoma 2021), emissions from residential and commercial buildings account for approximately 19% of Tacoma's total emissions, 10% and 9% respectively. The largest two emitters within Tacoma are transportation (44%) and the industrial sector (30%). Residential and commercial building are estimated to be responsible for 292,090 MTon of emissions in 2022 based on their electric and natural gas use. This is roughly even in distribution between the two sectors, with 52% (152,012 MTon) in residential and 48% (140,078 MTon) in commercial.

Natural gas space heating accounts for most of these emissions – 168,412 MTons or 58% of the total, with natural gas water heating and natural gas commercial food preparation equipment the second and third largest sources of emissions. Together these three natural gas end use loads account for over 85% of residential and commercial building emissions in Tacoma.

The residential and commercial sector analysis included below was conducted as part of the CBDS impact assessment using data provided by Tacoma Power, Puget Sound Energy, and the Tacoma Equity Index.

Residential Sector

Tacoma has 102,957 residential units. More than 98% of the units are single family detached (one unit), single family attached (2-4 attached units), or low-rise multifamily (5 or more units and three stories or less). Less than 1% of the units are mid/high rise multifamily (4-6 stories or 7 or more stories). Nearly 35,000 residential units in Tacoma have gas service.

As shown in Figure 2, space heating from natural gas furnaces and boilers accounts for nearly 70% of all residential emissions. Secondary heating from gas fireplaces accounts for an additional 5%. Natural gas water heaters account for an additional 18%. The total emissions from space and water heat across the sector is 92%.

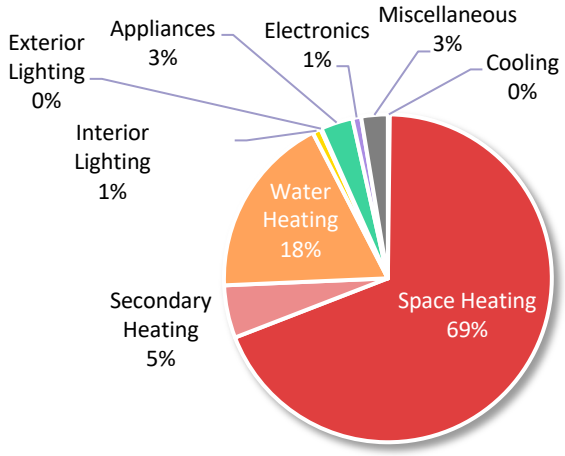

Figure 2. 2024 residential emissions by end use. *Source:* Tacoma Community Building Decarbonization Strategy.

As shown in Figure 3, single family homes contribute 75% of the total emissions, with low-rise multifamily the next largest contributor at 17%. The remaining home types contribute only 8% of all residential emissions.

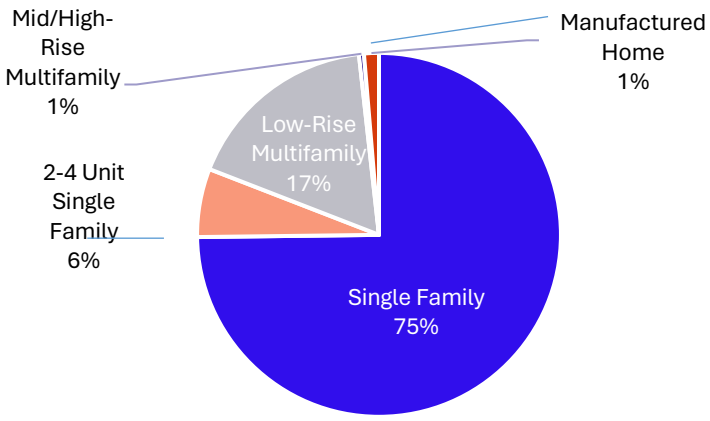

Figure 3. 2024 Residential emissions by housing type. *Source:* Tacoma Community Decarbonization Strategy.

Equity of the decarbonization process is of great concern to the City of Tacoma. Figure 4 shows how emissions are distributed across opportunity areas. Opportunity areas are used in Tacoma's Equity Index to assign levels of opportunity (from very high to very low) using 32 indicators across the following five categories: accessibility, livability, education, economy, and environmental health (City of Tacoma 2024). Here we see a relatively equal break out of emissions by opportunity area, with approximately 20% of the emissions attributed to each of the five area. Although, together the low and very low opportunity area account for more than 40% of residential emissions.

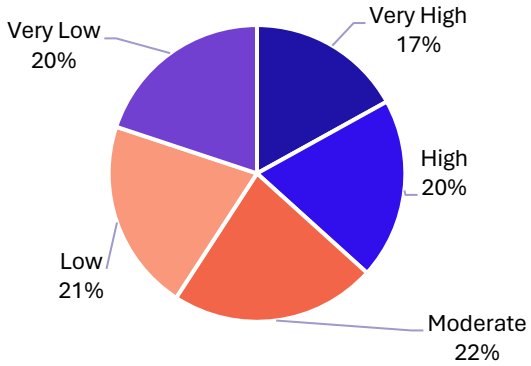

Figure 0. 2024 residential emissions by opportunity area. *Source:* Tacoma Community Decarbonization Strategy.

Residential takeaways include:

- Decarbonizing the residential sector should focus on zero-emission appliances such as heat pumps for space and water heating. These two end-uses account for 92% of total emissions in the sector.

- Secondary space heating, gas fireplaces, is the third largest end-use contributor to emissions at 5% of the total.
- Emissions are spread relatively evenly across opportunity areas. However, together the low and very low opportunity areas account for more than 40% of residential emissions and co-benefits may be larger in these opportunity areas.
- Single family homes have the largest concentration of emissions, at more than 75%. Single family plus low-rise multifamily account for 98% of emissions and, as such, should be the primary focus for the residential building decarbonization strategy.

Commercial Sector

Tacoma's commercial sector buildings include a total of just over 100 million square feet of commercial floor area, distributed among more than a dozen building types. More than 60% of all commercial floor area is in offices, retail buildings, schools, and warehouses. Figure 5 presents the commercial emissions in 2024 by end use. Space heating from natural gas furnaces and boilers accounts for 44% of all commercial emissions, water heating accounts for 25%, and food preparation accounts for an additional 20%. The total emissions from space and water heat across the sector is 69% and the total across all three end uses including food preparation is 89%.

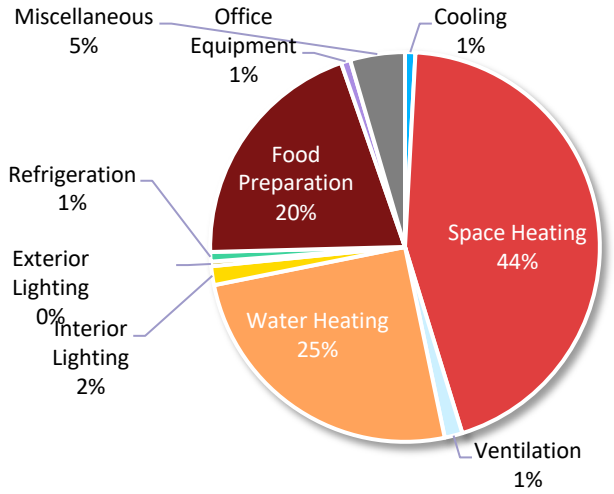

Figure 5. 2024 commercial emissions by end use. *Source:* Tacoma Community Decarbonization Strategy.

Figure 6 presents the commercial emissions in 2024 by building size. The size segments presented in this commercial sector emissions distribution align with the size cohorts for commercial and multifamily buildings that must comply with the Washington State Clean Buildings Performance Standard, which applies to buildings larger than 20,000 square feet (Washington State 2024). Over half of all the emissions in the commercial sector come from buildings less than or equal to 20,000 square feet, and an additional 21% come from buildings greater than 20,000 and up to 50,000 square feet.

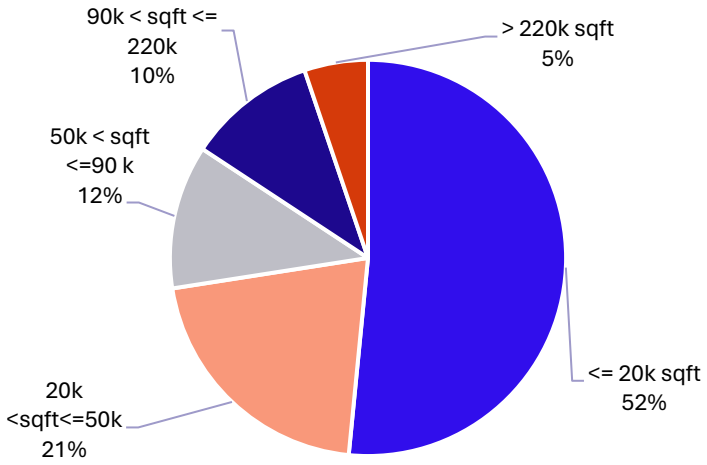

Figure 6. 2024 commercial emissions by building size. *Source:* Tacoma Community Decarbonization Strategy.

It is also important to consider how the commercial floor area is distributed across various size segments. 40% of Tacoma's commercial floor area is in buildings 20,000 square feet or smaller and therefore is not regulated by the Washington State Clean Building Performance Standard. Buildings greater than 20,000 square feet and up to 50,000 square feet are considered Tier 2 covered buildings. Tier 2 buildings must comply with benchmarking, energy management planning, and operations and maintenance requirements, but are not currently required to meet energy use intensity targets. Buildings over 50,000 square feet are considered Tier 1 covered buildings. Tier 1 buildings must comply with all building performance requirements, including energy use intensity targets with compliance dates in 2026-2028 depending on size.

Figure 7 shows how commercial building emissions are distributed across opportunity areas. In this case, emissions are not spread evenly across areas. Only 15% of commercial emissions are in high or very high opportunity areas. Of the remaining 85%, nearly 50% are in low or very low opportunity areas.

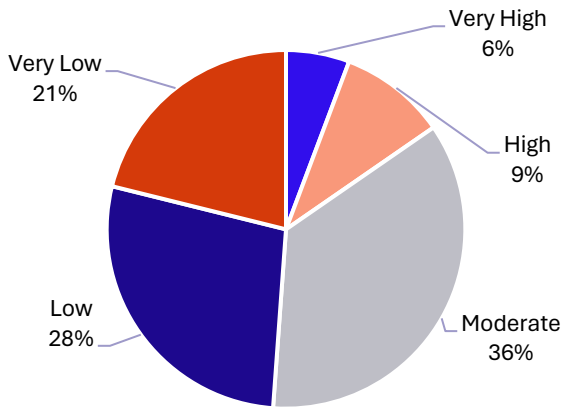

Figure 7. 2024 Commercial emissions by opportunity area. *Source:* Tacoma Community Decarbonization Strategy.

Commercial takeaways include:

- Unlike the residential sector, the commercial sector cannot be decarbonized by focusing mostly on space and water heat. Food preparation is a major contributor to emissions with 20% of the sector total, and 9% of the overall total.
- 73% of the emissions are emitted from buildings that are 50,000 square feet or smaller. Given that commercial buildings in this size segment are not currently required to meet building performance standard energy use intensity (EUI) targets, this size segment should be a primary focus for the strategy.
- Nearly half of the commercial sector emissions are from low and very low opportunity areas, while only 15% occur in high and very high areas.

Future Emissions

This section presents Tacoma's building decarbonization pathway recommended in the Implementation Roadmap (Roadmap) developed to inform the CBDS. The Roadmap is a bridge between the CBDS impact assessment and the holistic strategies, actions, and collaborative implementation in the CBDS. Whereas the impact assessment developed multiple scenarios and possible paths, the Roadmap recommends a specific building decarbonization pathway with 2050 targets and 2030 milestones. It provides a framework for assessing implementation and investment options and tradeoffs to help policy makers prioritize and inform actions in the CBDS.

The impact assessment identified the scale and pace of fossil-fuel equipment replacements (stock turnover) required to meet the Climate Action Plan emissions targets for 2050. It identified that nearly 80% of the emissions from Tacoma residential and commercial buildings is from onsite use of natural gas for space and water heating. Therefore, a central part of the building decarbonization path for Tacoma is to eliminate these onsite fossil fuel emissions. A critical path to accomplish this is to replace fossil fuel space and water heater appliances with zero-emission appliances such as high-efficiency electric heat pump technologies. Ideally, these replacements would be made as close as possible to the end of the useful life of the existing appliance. Current fossil fuel appliances used for space and water heating across Tacoma can be replaced by gradually increasing the percentage of zero-emission appliances sold and installed in new and existing buildings to 100%, and then sustaining that rate through 2050.

The technical analysis showed that to meet Climate Action Plan goals, nearly all fossil fuel appliances must be replaced with zero-emission appliances by 2050. Although the impact scenarios target gradual and complete rollover of all appliances in residential and commercial buildings by 2050, when considering the average life of various appliances, simple replace-on-burnout strategies will be insufficient for Tacoma to decarbonize the building sector by 2050. Therefore, the decarbonization strategy must accelerate replacements to ensure that each year, a certain percentage of appliances are replaced earlier. However, the analysis shows that the early replacements can be limited to appliances that are very close to burnout. The need for increasing the rate of replacements provides an opportunity to target early replacements to advance other goals, for example providing co-benefits such as cooling, more efficient heating systems, and better indoor air quality and health outcomes to homes in low-opportunity areas, including vulnerable populations.

According to the technical analysis, 2030 is the optimal year to reach 100% peak sales share of zero-emission appliances for new and replacement installations. This shift will require

rapid market transformation and the development of targeted, high-impact policies and programs during a ramp-up period between 2024 and 2030. Delaying 100% peak sales share of zero-emission appliances dramatically increases the number of appliances that will need to be replaced early and, in some instances, well ahead of burnout. Tacoma has approximately 27 years to fully decarbonize its building stock. However, space and water heating appliances can operate for 15-30 years or more. As a result, every year that Tacoma continues to install new and replacement fossil fuel appliances, the overall number of fossil fuel appliances that must be replaced increases, but the decarbonization deadline remains 2050. Therefore, if the peak rate is delayed, the appliances will need to be replaced years before burnout in order to decarbonize by 2050.

Targets & Milestones

The targets and milestones (Table 1) were developed based on the optimal decarbonization replacement rate identified in the technical analysis, which includes electrification of most building sector end uses by 2050. They include the endpoint targets and interim milestones that are critical to achieving the Climate Action Plan goals for 2050.

The targets and milestones are designed to:

- Gradually increase the sales share of zero-emission appliances each year between 2024 and 2030,
- Ramp up to 100% sales share of zero-emission appliances for new and replacement installations by 2030 and sustain this rate through approximately 2050 until the building sector is decarbonized,
- Transition to zero-emissions new construction by 2030,
- Replace fossil-fuel appliances in existing residential and commercial buildings by 2050,
- Provide an appliance replacement rate that can be used for policy and program design and to track progress.

In 2024, additional targets and milestones may be considered in coordination with Tacoma Power for energy efficiency, onsite renewables, and other distributed energy resources to ensure that building decarbonization implementation can help realize whole-building optimization opportunities and support grid reliability and health. For example, to minimize peak loads due to electrification, the utility can incentivize higher efficiency heat pumps and more air-tight and well insulated buildings.

Understanding the fundamental scale and pace required to decarbonize the building stock by 2050 is a critical first step in addressing equity, affordability, and opportunities for co-benefits. As shown in Table 1 below, to decarbonize Tacoma's residential sector by 2050, 100% of new residential units must be zero emissions and 100% of fossil-fuel space and water heating replacements must be zero-emissions by 2030. Achieving a 100% sales share for zero-emission space heating appliances by 2030 translates to 1,185 households every year starting in 2030, and this number must be maintained through 2050 to gradually replace all fossil-fuel appliances upon or close to burnout. This number of households is 200-300 more appliance replacements per year than the natural replacement rate for space-heating appliances. Approximately, 507 of the 1,185 households would be in low- and very-low opportunity areas. The strategies and actions in the

CBDS are designed to realize these targets while ensuring an equitable and affordable transition for Tacoma.

Table 1. Roadmap targets and milestones.

Target/Milestone	2030	2050
Residential Sector:		
Residential Sector Emissions Reduction	19%	96%
New Residential Construction: Zero-Emissions Units	100%	100%
Residential Zero-Emissions Appliance *Stock* Share	16%	100%
Residential Zero-Emissions Appliance *Sales* Share	100%	100%
Residential Zero-Emissions Appliance Replacement Rate (space heating for all households)	1,185 households/yr	1,185 households/yr
Residential Zero-Emissions Appliance Replacement Rate in Regular Opportunity Areas (as a subset of all households)	678 households/yr	678 households/yr
Residential Zero-Emissions Appliance Replacement Rate in Low and Very Low Opportunity Areas (as a subset of all households)	507 households/yr	507 households/yr
Commercial Sector:		
Commercial Sector Emissions Reduction	18%	94%
New Commercial Construction: Zero-Emissions Buildings	100%	100%
Commercial Zero-Emissions Appliance *Stock* Share	11%	100%
Commercial Zero-Emissions Appliance *Sales* Share	100%	100%
Commercial Zero-Emissions Appliance Replacement Rate	41 buildings/year	41 buildings/year

Phased Timeline

The CBDS is organized into three phases to inform the strategies and actions and to guide more detailed implementation planning and timelines in 2024. The phases are designed to meet the proposed targets and milestones with policies, programs, and market transformation phased to align with time-sensitive Tacoma, federal, and state policies, codes, standards, and funding.

Achieving the building decarbonization targets and Tacoma's goals to maximize co-benefits, equity, and affordability will require Tacoma to act quickly to establish the groundwork to ramp up zero-emission appliance installations to 100% sales share by 2030. The approach must be front-loaded with most policy, programmatic, and market transformation work put into place by 2030. It will require close collaboration among City departments. In addition, the City may need to rely on a regulatory framework and funding from state and federal policies and programs. In this case, the City's strategic role will include providing building decarbonization leadership across City departments and collaborating with stakeholders and other jurisdictions to advocate for energy codes, building performance standards, and other mandates at the regional

and state level to ensure that all segments of the commercial and residential sector have a clear trajectory to eliminate emissions by 2050.

Figure 8. Building Decarbonization Strategy phased timeline. *Source:* Tacoma Community Building Decarbonization Strategy.

Phase I (2024-2025): Build a Policy and Rapid Market Transformation Platform

The initial phase includes a major push to get all policies in place at all levels of government by the end of 2025. The City establishes a collaborative rapid market transformation platform to ramp up replacement rates. The platform should leverage and align with the timing of other key actions in other City strategies, such as the Affordable Housing Action Strategy, the Green Economic Development Strategy, Tacoma Power's Integrated Resource Plan, and the influx of federal incentives and tax credits through 2030 and beyond. During this phase, the City has opportunities to influence the development of keystone policies such as the 2024 Washington State Energy Code, the 2030 Washington Clean Building Performance Standard (BPS), and other standards and regulatory mechanisms that may be necessary to cover gaps in current mandates that likely can't be covered completely by the energy code and BPS in time to meet 2030 milestones. During this phase, the City should also build staff capacity to implement the decarbonization strategy, explore contracting opportunities with nonprofit and other partners, and ensure key tenant and anti-displacement policies recommended in Tacoma's Affordable Housing Action Strategy are adopted.

Phase II (2026-2030): Ramp Up Equitable Decarbonization

The second phase builds upon the platform in Phase 1 to implement a focused, rapid ramp-up of new and replacement zero-emission equipment. This effort involves increasing market demand, workforce, and manufacturing capacity while dramatically reducing costs and removing systemic barriers. The City should target high ratios of low-opportunity area homes and buildings, especially rental properties, to maximize and deal-stack incentives to ensure rapid decarbonization, other efficiency measures, and home repairs for these segments.

Phase III (2031-2050): Sustain Scale and Pace

At this point, all policies and mandates required to decarbonize Tacoma's building stock have become effective. Most segments and end uses have transitioned to 100% zero-emission new and replacement appliances as the default. Transition planning for both Tacoma Power and Puget Sound Energy is complete and considers the required replacement rates and associated grid and gas distribution system impacts at the local level. During this phase, the City mostly focuses on adaptive management, programmatic and market transformation support, and cross-

departmental leadership and monitoring necessary to ensure an equitable, gradual, and steady transition to healthy, affordable, zero-emission homes and buildings across Tacoma.

Strategies & Actions

Local governments have limited resources relative to the scale and pace of decarbonization. The CBDS recommends a collaborative approach and actions to help Tacoma realize the most essential, highest-leverage opportunities with the lowest administrative burden. It includes five interdependent strategies to deliver a gradual and permanent modernization, optimization, and decarbonization of Tacoma's building stock. The strategies are designed to work together to form a holistic approach to meet the targets, milestones, and timeline required to phase out fossil-fuel appliances in homes and buildings by 2050.

Each strategy includes priority actions to guide this historic investment in Tacoma's buildings, community, and economy (Table 2). Actions were designed to ensure that all segments have regulatory, programmatic, and market transformation guidance for their decarbonization journey to 2050. The innovation in the CBDS stems from specific actions, policies, and programs but is also largely driven by tight alignment and interconnectivity across funding mechanisms and implementation actors, which will maximize the effectiveness of each element.

As with Tacoma's Climate Action Plan, all actions provide opportunities to inform, educate, and engage with communities. Tacoma can use these and other tools, like regulations and incentives, to be effective. All actions must contribute to Tacoma's anti-racist, just transition away from fossil fuels, and must be implemented to increase benefits to and decrease burdens for BIPOC and other frontline communities.

Many of these actions will require further City Council action, whether that be approving funding or developing and approving legislation. This is just the list of prioritized high impact actions that will help the City Council achieve our climate goals. But implementing these actions will require additional authorization from our leaders and a high level of regional collaboration.

Table 2. Summary of strategies and actions.

Strategies	Actions
1. Adopt Comprehensive, Fast-Tracked Policies & Targets	• Adopt building decarbonization targets and milestones • Maintain current tenant protections in Tacoma's Rental Housing Code and ensure adoption of key actions from Tacoma's Anti-Displacement Strategy • Implement a Rental Housing Registry ordinance • Consider adopting a residential performance rating and disclosure ordinance • Advocate for a zero-emission appliance standard for WA state and/or Puget Sound with an effective year of 2030 • Advocate to update the WA Clean Building Performance Standard to align with Washington state's and Tacoma's building decarbonization targets and milestones • Advocate for updates to new construction and existing buildings requirements in the WA State Energy Code
2. Rapidly Transform the Market	• Develop and implement a broad and targeted communications and awareness campaign

	• Develop a City building electrification technology roadmap • Collaborate to align Tacoma Power conservation targets with building decarbonization targets • Implement zero-emissions retrofit programs for single-family housing, affordable and rental housing, large commercial buildings via a Clean Buildings Performance Standard Accelerator, and small commercial buildings • Collaborate in regional market transformation efforts • Increase workforce capacity • Reduce electrification costs • Reduce electrical service costs
3. Significantly Expand Funding and Financing	• Stack state and federal incentives to support City building decarbonization • Leverage Climate Commitment Act funds and federal grants • Investigate Tacoma Power authority to support income qualified customers with electrification • Develop and implement a plan for promoting performance-based contracting and financing mechanisms • Advocate for credit enhancements from the state green bank currently under development, and explore possible City funded credit enhancements
4. Develop Implementation Capacity and Collaboration	• Work with external stakeholders to align around shared goals and develop a collaboration framework to support strategy implementation • Identify and fund building decarbonization implementation capacity
5. Support Collaborative Utility Transition Planning	• Collaborate with Tacoma Power and Puget Sound Energy on communication, planning, and program design • Ensure Tacoma Power Integrated Resource Plan considers building decarbonization targets and milestones • Consider developing a neighborhood-scale decarbonization program

Coordinated Implementation

The CBDS identifies the technical and strategic pathway, targets, and milestones to equitably decarbonize Tacoma's homes and buildings by 2050. It includes five core strategies to drive swift and transformational shifts in building decarbonization policy, the pace of market adaptation, the volume of funding and financing flowing into Tacoma's economy, internal and city-wide implementation capacity, and utility transition planning. Well-coordinated, collaborative, and aggressive action on each of these interdependent strategies is required to achieve Tacoma's building decarbonization goals.

2024-2025 is a pivotal phase for implementing the CBDS and staying on track to meet 2030 milestones. Immediate next steps in 2024 include coordinating internally to establish roles and detailed action plans, developing budget proposals to increase staff capacity and fund CBDS implementation, and collaborating with Tacoma community stakeholders, relevant Washington state departments, and other jurisdictions and organizations to align around shared goals, targets, and timelines. Developing a collaboration framework with the critical actors included in the figure below will help Tacoma increase collective impact and advocacy for critical, time-sensitive priorities—such as changes to the Washington State Energy Code, updates to the Clean

Buildings Performance Standard, and a potential zero-emissions appliance standard—necessary to phase out new and replacement fossil-fuel space and water heating installations by 2030.

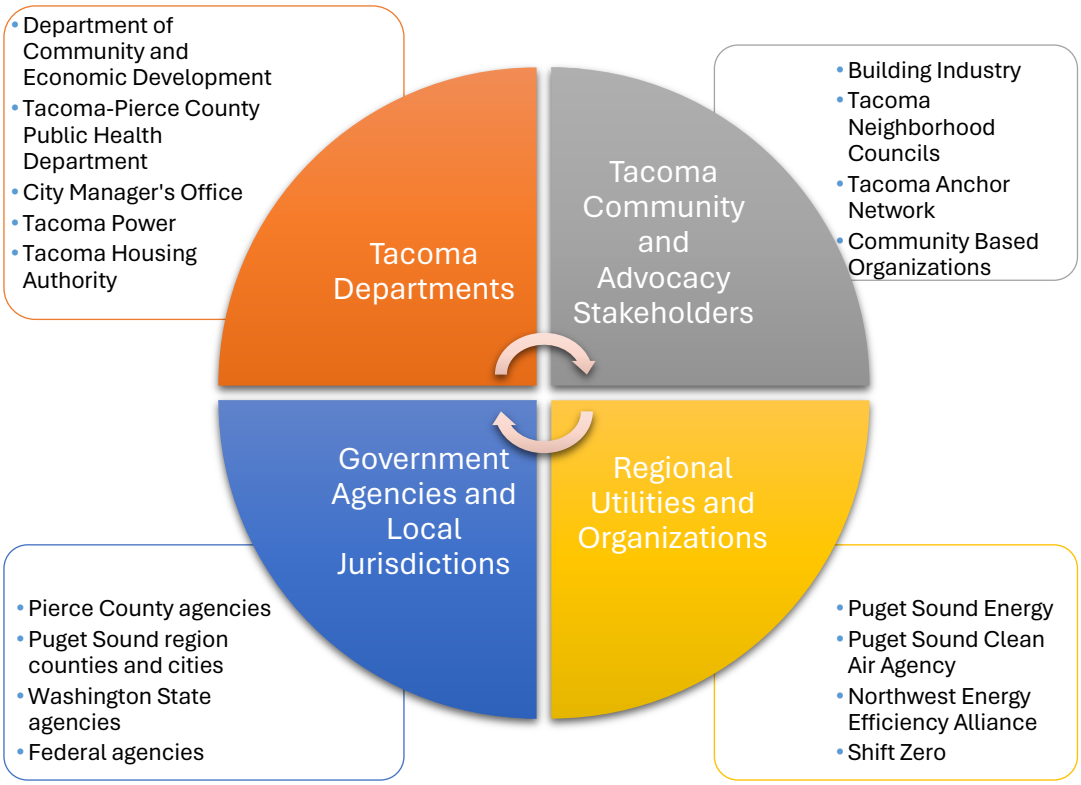

Figure 9. Collaboration with City of Tacoma departments and other stakeholders delivers on shared goals. *Source:* Tacoma Community Building Decarbonization Strategy.

Reflections on Strategy Development and Implementation

The CBDS was developed to sync heavily with Washington state and City of Tacoma emissions limits and deadlines. It represents extensive technical analysis and collaboration by internal and external stakeholders. The CBDS is also the first comprehensive building decarbonization strategy conducted by a city in Washington state. Upon completion of the CBDS report, the core team reflected on what work well in the strategy development and how these lessons learned can be applied to improve implementation of the CBDS. The results of these reflections are described below.

Reflections on what worked:

- The in-depth engagement with internal City of Tacoma department staff provided an opportunity to increase building decarbonization subject matter awareness, provided staff with a better sense of what sector-wide building decarbonization means for their departments, and how central buildings and building decarbonization can be for providing co-benefits and increasing equity. As such, the internal engagement helped build a foundation for coordinated and collaborative implementation.
- The internal coordination, including more than five meetings with utility staff, was also valuable for strengthening the relationship with the municipal electric utility; it presented

an opportunity for city and utility staff to share information and help align relevant studies and planning.
- The technical analysis and hyper local building stock characterization grounded the strategy and provided a bird's eye view into the true scale and pace of building decarbonization specifically for Tacoma. This insight was helpful for targeting strategies.
- Aligning technical analysis with building segmentation in the Washington state energy code and building performance standards helped ensure strategies and actions are more actionable within Tacoma's policy context.

Considerations for implementation:

- The CBDS impact assessment was in-depth and very tailored to Tacoma, but moving forward, there are opportunities to do more targeted assessment of benefits, especially when thinking about how to estimate long-term societal benefits versus localized upfront costs.
- Local governments have capacity constraints and it can be difficult to integrate decarbonization implementation into larger city planning efforts and departmental work. Although, the CBDS prioritized capacity development and funding in the strategies and actions, it is still challenging to launch actions as quickly as needed to meet emissions reduction goals.
- The scale and pace of building decarbonization can be daunting. The detailed targets and milestones in this strategy can help strategy implementers calibrate efforts to the incremental retrofits needed each year, and track progress against those targets.

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