



**BERKELEY CITY COUNCIL FACILITIES, INFRASTRUCTURE,
TRANSPORTATION, ENVIRONMENT & SUSTAINABILITY COMMITTEE
REGULAR MEETING**

**Wednesday, November 1, 2023
2:00 PM**

2180 Milvia Street, 6th Floor - Redwood Room

Committee Members:

Councilmembers Terry Taplin, Kate Harrison, and Rigel Robinson
Alternate: Councilmember Mark Humbert

This meeting will be conducted in a hybrid model with both in-person attendance and virtual participation. For in-person attendees, face coverings or masks that cover both the nose and the mouth are encouraged. If you are feeling sick, please do not attend the meeting in person.

Remote participation by the public is available through Zoom. To access the meeting remotely using the internet: Join from a PC, Mac, iPad, iPhone, or Android device: Use URL <https://cityofberkeley-info.zoomgov.com/j/1606230651>. If you do not wish for your name to appear on the screen, then use the drop down menu and click on "rename" to rename yourself to be anonymous. To request to speak, use the "raise hand" icon on the screen. To join by phone: Dial **1-669-254-5252** or **1-833-568-8864 (Toll Free)** and Enter Meeting ID: **160 623 0651**. If you wish to comment during the public comment portion of the agenda, press *9 and wait to be recognized by the Chair.

To submit a written communication for the Committee's consideration and inclusion in the public record, email policycommittee@berkeleyca.gov.

Written communications submitted by mail or e-mail to the Facilities, Infrastructure, Transportation, Environment & Sustainability Committee by 5:00 p.m. the Friday before the Committee meeting will be distributed to the members of the Committee in advance of the meeting and retained as part of the official record.

AGENDA

Roll Call

Public Comment on Non-Agenda Matters

Minutes for Approval

Draft minutes for the Committee's consideration and approval.

1. Minutes - July 19, 2023

Committee Action Items

The public may comment on each item listed on the agenda for action as the item is taken up. The Chair will determine the number of persons interested in speaking on each item. Up to ten (10) speakers may speak for two minutes. If there are more than ten persons interested in speaking, the Chair may limit the public comment for all speakers to one minute per speaker. Speakers are permitted to yield their time to one other speaker, however no one speaker shall have more than four minutes.

Following review and discussion of the items listed below, the Committee may continue an item to a future committee meeting, or refer the item to the City Council.

2. **Building Emissions Saving Ordinance (BESO) - Time of Sale Energy Upgrades** **From: City Manager**

Recommendation: Review proposed amendments to Berkeley's Building Emissions Saving Ordinance (BESO) to require energy upgrades for 1-4 unit residential buildings when they're sold.

Financial Implications: See report

Contact: Jordan Klein, Planning and Development, (510) 981-7400

3. **Adopt an Ordinance Adding Chapter 12.39 to the Berkeley Municipal Code to Regulate Deconstruction and Construction Materials Management**

From: Councilmember Harrison (Author)

Referred: June 12, 2023

Due: November 27, 2023

Recommendation:

1. Adopt an ordinance adding Chapter 12.39 to the Berkeley Municipal Code to regulate management of deconstruction and construction materials.

2. Refer to the November 2023 Budget AAO Process \$[x] to administer and enforce the ordinance.

3. Refer to the City Attorney's Office to conduct a nexus fee study for a potential social cost of carbon fee applied to landfilled construction and demolition debris.

Financial Implications: See report

Contact: Kate Harrison, Councilmember, District 4, (510) 981-7140

Unscheduled Items

These items are not scheduled for discussion or action at this meeting. The Committee may schedule these items to the Action Calendar of a future Committee meeting.

4. Adopt an Ordinance Adding a New Chapter 12.01 to the Berkeley Municipal Code Establishing Emergency Greenhouse Gas Limits, Process for Updated Climate Action Plan, Monitoring, Evaluation, Reporting and Regional Collaboration

From: Councilmember Harrison (Author), Councilmember Bartlett (Co-Sponsor) and Councilmember Hahn (Co-Sponsor)

Referred: November 15, 2021

Due: December 31, 2023

Recommendation:

1. Adopt an ordinance adding a new Chapter 12.01 to the Berkeley Municipal Code (BMC) establishing Emergency Greenhouse Gas Limits with an effective date of [], 2022.

2. Refer to the FY23-24 Budget Process \$[] consistent with implementing the requirements of Sections 12.01.040, 12.01.050, 12.01.060.

Financial Implications: See report

Contact: Kate Harrison, Councilmember, District 4, (510) 981-7140

Items for Future Agendas

- **Requests by Committee Members to add items to the next agenda**

Adjournment

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*Written communications addressed to the Facilities, Infrastructure, Transportation, Environment & Sustainability Committee and submitted to the City Clerk Department will be distributed to the Committee prior to the meeting.*

*This meeting will be conducted in accordance with the Brown Act, Government Code Section 54953 and applicable Executive Orders as issued by the Governor that are currently in effect. Members of the City Council who are not members of the standing committee may attend a standing committee meeting even if it results in a quorum being present, provided that the non-members only act as observers and do not participate in the meeting. If only one member of the Council who is not a member of the committee is present for the meeting, the member may participate in the meeting because less than a quorum of the full Council is present. Any member of the public may attend this meeting. Questions regarding this matter may be addressed to Mark Numainville, City Clerk, (510) 981-6900.*



**COMMUNICATION ACCESS INFORMATION:**

This meeting is being held in a wheelchair accessible location. To request a disability-related accommodation(s) to participate in the meeting, including auxiliary aids or services, please contact the Disability Services specialist at (510) 981-6418 (V) or (510) 981-6347 (TDD) at least three business days before the meeting date. Attendees at public meetings are reminded that other attendees may be sensitive to various scents, whether natural or manufactured, in products and materials. Please help the City respect these needs.

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I hereby certify that the agenda for this meeting of the Standing Committee of the Berkeley City Council was posted at the display case located near the walkway in front of the Maudelle Shirek Building, 2134 Martin Luther King Jr. Way, as well as on the City's website, on October 26, 2023.



Mark Numainville, City Clerk

## **Communications**

*Communications submitted to City Council Policy Committees are on file in the City Clerk Department at 2180 Milvia Street, 1st Floor, Berkeley, CA, and are available upon request by contacting the City Clerk Department at (510) 981-6908 or [policycommittee@berkeleyca.gov](mailto:policycommittee@berkeleyca.gov).*

**BERKELEY CITY COUNCIL FACILITIES, INFRASTRUCTURE,  
TRANSPORTATION, ENVIRONMENT & SUSTAINABILITY COMMITTEE  
REGULAR MEETING MINUTES**

**Wednesday, July 19, 2023  
2:00 PM**

2180 Milvia Street, 6th Floor - Redwood Room

Committee Members:

Councilmembers Terry Taplin, Kate Harrison, and Rigel Robinson  
Alternate: Councilmember Mark Humbert

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## MINUTES

**Roll Call:** 2:09 p.m.

**Present:** Harrison, and Robinson

**Absent:** Taplin

Councilmember Taplin present at 2:17 p.m.

**Public Comment on Non-Agenda Matters:** 2 speakers.

### Minutes for Approval

*Draft minutes for the Committee's consideration and approval.*

#### 1. Minutes - June 21, 2023

**Action:** M/S/C (Robinson/Harrison) to approve the June 21, 2023 minutes.

**Vote:** Ayes – Robinson, Harrison; Noes – None; Abstain – None; Absent – Taplin.

## Committee Action Items

*The public may comment on each item listed on the agenda for action as the item is taken up. The Chair will determine the number of persons interested in speaking on each item. Up to ten (10) speakers may speak for two minutes. If there are more than ten persons interested in speaking, the Chair may limit the public comment for all speakers to one minute per speaker. Speakers are permitted to yield their time to one other speaker, however no one speaker shall have more than four minutes.*

*Following review and discussion of the items listed below, the Committee may continue an item to a future committee meeting, or refer the item to the City Council.*

### 2. 51B Bus Rapid Transit

**From: Councilmember Taplin (Author)**

**Referred: November 28, 2022**

**Due: July 21, 2023**

**Recommendation:** 1) Refer to the City Manager commencement of a feasibility analysis and community engagement process to develop options for the implementation of Bus Rapid Transit (BRT) improvements along AC Transit's 51B route; options are to be developed in tandem with internal city departments, including Public Works, Fire, and Economic Development, and interagency partners, including AC Transit, the Alameda County Transportation Commission, and UC Berkeley Bear Transit; community engagement is to emphasize students, transportation advocates, transit riders, the disability rights community, the faith community, the senior community, local merchants, and tenants; consultation with AC Transit and UC Berkeley Bear Transit on planning, scoping, and implementation is to begin as soon as possible.

2) Refer \$150,000 to the FY 2025-2026 budget process for consulting costs to conduct corridor studies along University Avenue, from Seawall Drive, to Oxford Street, and along Oxford Street and Fulton Street, from Virginia Street to Durant Avenue, to identify appropriate road safety improvements that advance city-adopted safety, transportation, and climate goals and are continuous with work currently underway on the Addison Bicycle Boulevard, and explore improvements for curb management, i.e. accessible parking (blue curbs), loading zones for third party deliveries, etc.

3) Refer \$150,000 to the FY 2025-2026 budget process for consulting costs to conduct a comprehensive accessibility analysis of the city's 4-way intersections and return recommendations to achieve uniformity and consistency of ADA improvements, i.e. width of curb cuts to accommodate wheelchair access, auditory functions of crossing signals, siting of facilities, bulb-outs, shortening crossing distances, and other safety improvements where appropriate and optimal.

**Financial Implications:** See report

Contact: Terry Taplin, Councilmember, District 2, (510) 981-7120

**Action:** 4 speakers. M/S/C (Harrison/Robinson) to forward the item to Council with a positive recommendation.

**Vote:** All Ayes.

## Unscheduled Items

*These items are not scheduled for discussion or action at this meeting. The Committee may schedule these items to the Action Calendar of a future Committee meeting.*

**3. Adopt an Ordinance Adding a New Chapter 12.01 to the Berkeley Municipal Code Establishing Emergency Greenhouse Gas Limits, Process for Updated Climate Action Plan, Monitoring, Evaluation, Reporting and Regional Collaboration**

**From: Councilmember Harrison (Author), Councilmember Bartlett (Co-Sponsor) and Councilmember Hahn (Co-Sponsor)**

**Referred: November 15, 2021**

**Due: July 31, 2023**

**Recommendation:** 1. Adopt an ordinance adding a new Chapter 12.01 to the Berkeley Municipal Code (BMC) establishing Emergency Greenhouse Gas Limits with an effective date of [ ], 2022.

2. Refer to the FY23-24 Budget Process \$[ ] consistent with implementing the requirements of Sections 12.01.040, 12.01.050, 12.01.060.

**Financial Implications:** See report

Contact: Kate Harrison, Councilmember, District 4, (510) 981-7140

**4. Adopt an Ordinance Adding Chapter 12.39 to the Berkeley Municipal Code to Regulate Deconstruction and Construction Materials Management**

**From: Councilmember Harrison (Author)**

**Referred: June 12, 2023**

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**Recommendation:** 1. Adopt an ordinance adding Chapter 12.39 to the Berkeley Municipal Code to regulate management of deconstruction and construction materials.

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3. Refer to the City Attorney's Office to conduct a nexus fee study for a potential social cost of carbon fee applied to landfilled construction and demolition debris.

**Financial Implications:** See report

Contact: Kate Harrison, Councilmember, District 4, (510) 981-7140

## Items for Future Agendas

- None



## Adjournment

**Action:** M/S/C (Harrison/Robinson) to adjourn the meeting.

**Vote:** All Ayes.

Adjourned at 2:54 p.m.

I hereby certify that the foregoing is a true and correct record of the Facilities, Infrastructure, Transportation, Environment & Sustainability Committee meeting held on July 19, 2023.

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Neetu Salwan, Assistant City Clerk

## Communications

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Planning and Development Department  
Office of Energy and Sustainable Development

## BUILDING EMISSIONS SAVING ORDINANCE (BESO)

### Existing 1-4 Unit Buildings – Flexible Building Performance Standard

#### Background:

In December 2020, Berkeley City Council amended Berkeley’s Building Emissions Saving Ordinance (BESO) and directed staff to recommend energy upgrade requirements for Council’s consideration. Prior to BESO, from 1987-2015, Berkeley had required prescriptive energy efficiency measures at time of sale through the Residential Energy Conservation Ordinance (RECO). Staff assembled a Technical Advisory Committee in spring 2023 to provide expert input on energy upgrade requirements for small residential buildings to accelerate decarbonization in existing buildings. Any requirements will be verified when properties are listed and sold through Berkeley’s BESO program.

#### Policy Objectives:

- **Accelerate building electrification upgrades** – Create upgrade requirements to reduce harmful emissions and prepare homes for electrification
- **Promote early compliance** – Encourage building owners to complete the BESO energy upgrades as soon as possible, prior to selling their building
- **Align with available resources** – Include requirements that are eligible for incentive programs or other resources to offset costs
- **Ensure smooth sales process** – Align requirements and timelines with the selling/buying process
- **Provide flexible compliance paths**– Allow owners to prioritize energy upgrades that improve the health, safety, and comfort of their building and maximize ease of compliance
- **Ensure renters are protected** – Prevent additional burdens for renters while improving rental units

#### Upgrade Requirement:

- Flexible (credit based) Building Performance Standard **OR**
- One heat pump system for hot water heating or heating/cooling of space

Covered buildings/units would need to complete various upgrade measure(s) to achieve a minimum number of credits. To maximize flexibility, a variety of upgrade measures would be available to a building owner. Buildings that have at least one heat pump system (water heating or HVAC system) installed would be exempt from completing additional upgrades.

#### Potential Eligible Measures:

##### ***Electrification:***

- Heat Pump Water Heater (*Full Compliance*)
- Heat Pump HVAC (*Full Compliance*)
- EV Charging Station
- Induction Range

##### ***Resilience and Safety:***

- Solar PV Installation
- Battery storage installation
- Knob and tube wiring replacement

**Energy Efficiency:**

- Attic Insulation
- Wall Insulation
- Floor Insulation/Crawlspace Improvement
- Air Sealing (verified)

- Window replacements
- Duct Sealing/Replacement (verified)

**Electric Ready:**

- Pre-wiring & 240v outlets
- Electrical panel service upgrade

This list of potential upgrade measures is subject to change. Each measure would have a corresponding credit value based on emissions/energy savings, cost, electric readiness, or health, safety, and equity benefits. A process will be developed to vet new measures with technical advisors and update this list as new technologies are developed.

**Covered Buildings and Phase-in:**

**Phase I:**

- Single family homes (including ADUs), Duplexes, Condominium’s within 1-4 Unit buildings – *Expected implementation 2025*

**Phase II:**

- Triplexes and Fourplexes (3-4 Unit buildings) – *Expected implementation by 2027*

**Implementation and Compliance Process:**

**Home Energy Score Assessment:**

- Prior to listing a covered building/unit for sale, sellers will complete a Home Energy Score Assessment which will be provided to the City and potential buyers.

***Pathway 1 - Home has a heat pump system:***



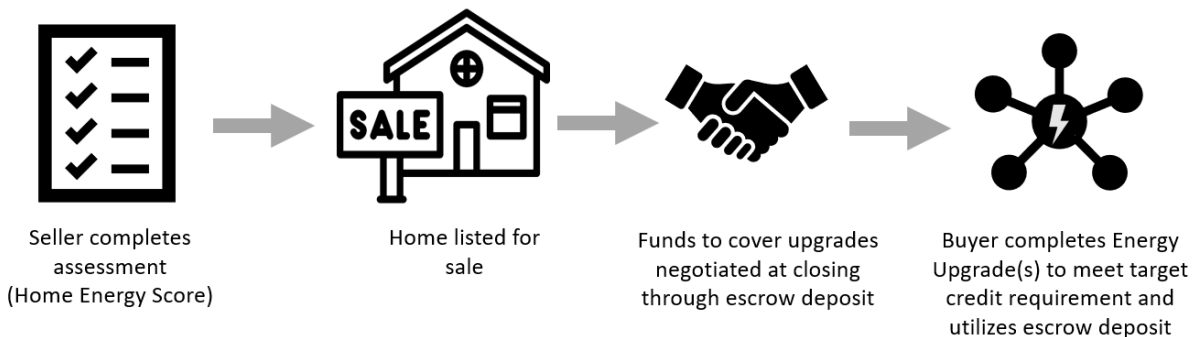
***Pathway 2 - Upgrades are required (i.e. no heat pump):***

**Utilize escrow deposit process:**

- If upgrades are required, a monetary deposit is sent to the City and refunded once the property is compliant. The deposit is negotiated between the buyer and seller and settled during escrow.

**Upgrade timeline:**

- Owners would have up to two years to complete and verify upgrades.
- Additional hardship exemptions and deferrals will be included.





Kate Harrison  
Councilmember, District 4

ACTION CALENDAR  
June 27, 2023

To: Honorable Mayor and Members of the City Council  
From: Councilmember Harrison  
Subject: Adopt an Ordinance Adding Chapter 12.39 to the Berkeley Municipal Code to Regulate Deconstruction and Construction Materials Management

RECOMMENDATION

1. Adopt an ordinance adding Chapter 12.39 to the Berkeley Municipal Code to regulate management of deconstruction and construction materials.
2. Refer to the November 2023 Budget AAO Process **\$[x]** to administer and enforce the ordinance.
3. Refer to the City Attorney's Office to conduct a nexus fee study for a potential social cost of carbon fee applied to landfilled construction and demolition debris.

CURRENT SITUATION, EFFECTS, AND RATIONALE FOR RECOMMENDATION

The accumulation, collection, removal and disposal of waste associated with construction, deconstruction and demolition activities needs to be regulated for the protection of the public health, safety and welfare, climate and natural environment.

According to the World Green Building Council, 11% of all energy-related carbon emissions result from building materials and construction activities.<sup>1</sup> These emissions are often referred to as “embodied carbon,” which the International Code Council defines “the carbon emissions released during the extraction, manufacturing, transportation, construction and end-of-life phases of buildings.”<sup>2</sup>

Emissions are not only embodied in new construction materials and activities, but also in those of the past. The current built environment represents the physical manifestation of past greenhouse gas emissions (GHGs), and given the imperative of rapidly reducing GHGs, such material must be prioritized for preservation, or reuse. Every part of the built environment, whether constructed with ancient redwood timber in the nineteenth century or Canadian Douglas fir and pine in the twenty-first, must be considered and valued

<sup>1</sup> “Bringing Embodied Carbon Upfront.” World Green Building Council, 25 Jan. 2023, <https://worldgbc.org/article/bringing-embodied-carbon-upfront/>.

<sup>2</sup> “Embodied Carbon.” ICC, 11 May 2021, <https://www.iccsafe.org/advocacy/embodied-carbon/>.

within the context of cumulative historic emissions and dwindling and nearly expired carbon budgets.

State law imperfectly addresses the end-of-life phases of buildings through the California Integrated Waste Management Act of 1989 and the California Green Building Code, which requires local governments to require fifty percent of construction debris be diverted from the landfill. Senate Bill 1374 further requires annual reporting to the state on progress made in the diversion of construction related materials, including information on programs and ordinances implemented and quantitative data, where available. In 2016, of Berkeley's total waste stream, 10% was from construction and demolition materials. As discussed below, this number is now likely much higher given the recent uptick in construction.

Additional required minimum diversion rates by project type are covered under the California Green Building Code and the City's local amendments in BMC Title 19 (2019), Buildings and Construction. As a minimum, the latest State code requires 65% of non-hazardous construction and demolition (C&D) waste to be reused *or* recycled. In addition, the State also requires recycling or reuse of 100% of excavated soil and land-clearing debris, concrete, and asphalt. Current requirements include a "Construction Waste Management Plan" survey and requirement to provide receipts of recycled and salvaged material. The extent of enforcement is unclear.

Existing laws fall short because there is no state or local requirement that requires property owners or developers to work with the City to develop an accountable plan to carefully take apart a building to maximize reusable materials, whether onsite or through a salvaging operation. In addition, recycling, an allowed alternative to reuse of demolition materials may not maximize capturing embodied carbon. For example, State law includes loopholes that allow a certain percentage of demolition materials to be 'recycled' as a cover to layers of trash in landfills.

This proposed ordinance aims to implement best practice methods for separation, handling, and delivery of deconstruction and construction site materials to maximize the salvage of building materials for reuse, to reduce the amount of C&D related materials disposed in landfills and to establish deconstruction and source separation requirements.

Other jurisdictions, such as Palo Alto and Portland, have implemented similar deconstruction ordinances. To protect public health, safety and welfare, climate and natural environment, it is in the public interest to adopt this ordinance.

## BACKGROUND

In 2021, the World Green Building Council warned that by 2050 “the [global] building stock is expected to double in size. Carbon emissions released before the built asset is used, referred to as ‘upfront carbon’, will be responsible for half of the entire carbon footprint of new construction between now and 2050, threatening to consume a large part of our remaining carbon budget.”<sup>3</sup> Viewed over the next 10 years, the window scientists view as critical to limiting catastrophic warming emissions, new embodied carbon represents a significant 72% of total building sector emissions.<sup>4</sup> Much of these emissions include those associated with the demolition of existing buildings and the new buildings that replace them.

*Buildings Magazine*, a trade magazine for facility managers and owners of commercial and public buildings, estimates that already an astounding 30% of all waste in the United States is construction and demolition waste. New construction is associated with an average of 3.9 pounds of waste per square foot while demolition yields an astounding 155 pounds of waste per square foot.<sup>5</sup>

When a building is haphazardly demolished to make way for new construction, not only are carbon emissions typically expended to tear it down and transport it for waste processing and disposal, but the former building, composed of many tons of carbon emissions and products arranged in a form useful to society, is rendered useless as waste, or much less useful to society as recyclable material. Instead, the builder replaces the demolished structure with new embodied carbon in constructing the new building, which generates new waste and additional emissions.

According to a 2011 study, even assuming a 30% increase in efficiency resulting from a newly constructed building, it takes 10 to 80 years for the newer and more efficiently operating building to ‘break even’ or offset the negative carbon impacts associated with replacing an average-performing existing building (not accounting for the “lost” carbon originally embodied in the original building).<sup>6</sup> The following figure demonstrates the

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<sup>3</sup> “Bringing Embodied Carbon Upfront.”

<sup>4</sup> Logan, Katharine. “Continuing Education: Embodied Carbon & Adaptive Reuse.” *Architectural Record* RSS, *Architectural Record*, 25 May 2022, <https://www.architecturalrecord.com/articles/15481-continuing-education-embodied-carbon-adaptive-reuse>.

<sup>5</sup> Monroe, Linda. *Diverting Construction Waste | Buildings*. <https://www.buildings.com/department/article/10192921/diverting-construction-waste>; See also, Sahabi, Ali. “Structural Retrofits Reduce the Carbon Footprint (Part 2 of 3) - USGBC-La.” *USGBC*, 25 Feb. 2023, <https://usgbc-la.org/2023/02/09/structural-retrofits-reduce-the-carbon-footprint-part-2-of-3>.

<sup>6</sup> “National Trust for Historic Places: Return to Home Page.” *The Greenest Building: Quantifying the Environmental Value of Building Reuse*, Preservation Green Lab of the National Trust for Historic Preservation, 2011, <https://forum.savingplaces.org/connect/community-home/librarydocuments/viewdocument?DocumentKey=227592d3-53e7-4388-8a73->

number of years required in Portland and Chicago for various forms of newly constructed efficient buildings replacing demolished inefficient buildings to ‘break even’ with or ‘overcome’ the new emissions associated with new construction (note: this figure does not include embodied emissions wasted as part of the original construction):

**Year Of Carbon Equivalency For Existing Building Reuse Versus New Construction**

This study finds that it takes between 10 to 80 years for a new building that is 30 percent more efficient than an average-performing existing building to overcome, through efficient operations, the negative climate change impacts related to the construction process. This table illustrates the numbers of years required for new, energy efficient new buildings to overcome impacts.

| Building Type                        | Chicago  | Portland |
|--------------------------------------|----------|----------|
| Urban Village Mixed Use              | 42 years | 80 years |
| Single-Family Residential            | 38 years | 50 years |
| Commercial Office                    | 25 years | 42 years |
| Warehouse-to-Office Conversion       | 12 years | 19 years |
| Multifamily Residential              | 16 years | 20 years |
| Elementary School                    | 10 years | 16 years |
| Warehouse-to-Residential Conversion* | Never    | Never    |

\*The warehouse-to-multifamily conversion (which operates at an average level of efficiency) does not offer a climate change impact savings compared to new construction that is 30 percent more efficient. These results are driven by the amount and kind of materials used in this particular building conversion. As evidenced by the study’s summary of results, as shown on page VII, the warehouse-to-residential conversion does offer a climate change advantage when energy performance for the new and existing building scenarios are assumed to be the same. This suggests that it may be especially important to retrofit warehouse buildings for improved energy performance, and that care should be taken to select materials that will maximize environmental savings.

7

Since 2011, the advent of new insulation and electrification technologies make renovating or adapting older buildings more competitive in terms of reducing existing onsite carbon emissions.<sup>8</sup> This ordinance takes the perspective that both the carbon avoided by reusing existing materials (as in the examples above) and the carbon used in the original construction need to be considered as impacts of C&D and be accounted for in addressing the climate emergency. In other words, existing buildings represent

c2861f1070d8&CommunityKey=00000000-0000-0000-0000-000000000000&tab=librarydocuments, p. VIII.

<sup>7</sup> Id.

<sup>8</sup> Id., p. 20



historic expenditures of carbon and demolition needs to be seen as both destroying the usefulness of past emissions and *contributing new emissions*.

The greenest building is the one that already exists.<sup>9</sup> The best way to avoid new carbon emissions, and to repurpose or restore the use value of existing emissions, is to preserve and renovate existing structures. To the extent that new or additional uses are needed, e.g., converting a single-family home into a multiplex, the lowest carbon path is to maintain as much of the original structure as possible with expansions and modifications as needed. Such a strategy maintains the integrity of the historic embodied carbon, and minimizes expenditure of new carbon emissions. For example, UC Berkeley's new Engineering Center includes adaptive reuse which UC states "will significantly lower the carbon emissions of the project, including more than a 90% reduction in demolition."<sup>10</sup>

A 2021 study conducted by ECONorthwest found that "conservatively speaking, residential and commercial demolitions in the City of Portland are responsible for 124,741 metric tons of CO<sub>2</sub> emissions per year, which amounts to approximately 4.5 percent of the City's total annual [emissions] reduction goal."<sup>11</sup>

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<sup>9</sup> Adam, Robert. "The Greenest Building Is the One That Already Exists." *The Architects' Journal*, 13 Aug. 2021, <https://www.architectsjournal.co.uk/news/opinion/the-greenest-building-is-the-one-that-already-exists>.

<sup>10</sup> "Engineering Center." *Berkeley Engineering*, 2 May 2023, [engineering.berkeley.edu/about/facilities/engineering-center/](https://engineering.berkeley.edu/about/facilities/engineering-center/).

<sup>11</sup> Oregon, Restore. "Understanding the Carbon Cost of Demolition." *Restore Oregon*, 1 Oct. 2021, <https://restoreoregon.org/2021/04/12/understanding-the-carbon-cost-of-demolition/>.

## Fight Climate Change with Restoration & Reuse

Oregon's existing buildings are among our greatest renewable resources.

### THE HIDDEN COST OF DEMOLITION & RECONSTRUCTION



**126 METRIC TONS OF CARBON**

Renovating a 1,500 SF older home, instead of tearing one down and replacing it with 3,000 SF of new construction, reduces CO2 emissions by 126 tons.



**1,383 METRIC TONS OF CARBON**

Renovating a 10,000 SF commercial building versus replacing it with a 20,000 SF structure, which uses more energy-intensive materials, reduces CO2 emissions by 1,383 tons.

### RENOVATION & REUSE PREVENT EMISSIONS



**44,048 GALLONS OF GAS**

A savings of 126 tons of embodied CO2 is roughly equivalent to preventing the emissions from 44,048 gallons of gasoline.



**464,127 GALLONS OF GAS**

The carbon savings for a commercial building is equivalent to preventing the emissions from 464,127 gallons of gasoline.

### LOOKED AT ANOTHER WAY...



**93 CARS OFF THE ROAD**

The average car uses 474 gallons of gasoline per year. Renovating just one older home, vs. demolishing/replacing it, equates to taking 93 cars off the road for an entire year.



**1,028 CARS OFF THE ROAD**

Renovating an existing commercial structure makes an even bigger impact as its renovation equates to taking 1,028 cars off the road for an entire year.

### DO THE MATH: IT REALLY ADDS UP!



From 2016-2020 in Portland, over 823 houses were demolished. That's equivalent to annual emissions from **76,480 cars!**



Over the same five years, 376 of Portland's commercial structures were razed. That's equivalent to annual emissions from **386,528 cars!**

Embodied energy is all the energy used constructing a building, including the creation of materials and building components as well as their transportation of the site.

12

### City of Berkeley’s Current Construction and Demolition Waste

A 2017 StopWaste Waste Characterization Study for Alameda County found that approximately 10% of Berkeley’s total waste tonnage in 2016 resulted from C&D debris.<sup>13</sup>

2017 Waste Characterization Study Design  
StopWaste of Alameda County, CA

SCS ENGINEERS

Exhibit 2. 2016 Annual Waste Quantities – Adjusted

| Originating Jurisdiction | MSW                                |               |                |               |                |                | C&D             |              |               | Special         |               |              |               | Unknown     | Total          |
|--------------------------|------------------------------------|---------------|----------------|---------------|----------------|----------------|-----------------|--------------|---------------|-----------------|---------------|--------------|---------------|-------------|----------------|
|                          | Davis Street TS                    | Berkeley TS   | BLT Ent TS     | Altamont LF   | Vasco Rd LF    | TOTAL          | Davis Street TS | Altamont LF  | TOTAL         | Davis Street TS | Altamont LF   | Vasco Rd LF  | TOTAL         | Vasco Rd LF |                |
| Alameda                  | 23,417                             | 36            |                |               | 344            | 23,796         | 1,283           | 135          | 1,418         |                 | 355           | 14           | 369           |             | 25,583         |
| Albany                   | 3,567                              | 364           |                |               | 2              | 3,933          | 1,023           |              | 1,023         |                 | 0             |              | 0             |             | 4,956          |
| Berkeley                 | 2,091                              | 47,014        |                | 171           | 76             | 49,352         | 5,269           | 5            | 5,274         |                 | 432           | 11           | 443           |             | 55,069         |
| Castro Valley SD         | INCLUDED IN Alameda Unincorporated |               |                |               |                |                |                 |              |               |                 |               |              |               |             |                |
| Dublin                   | 51                                 |               |                | 28,591        | 1,602          | 30,244         | 25              | 41           | 66            |                 | 97            | 60           | 158           |             | 30,468         |
| Emeryville               | 5,873                              | 166           |                |               | 16             | 6,056          | 3,051           |              | 3,051         |                 | 349           | 2            | 351           |             | 9,457          |
| Fremont                  | 417                                |               | 156,167        | 2             | 918            | 157,503        | 229             | 127          | 356           |                 | 305           | 347          | 652           |             | 158,510        |
| Hayward                  | 78,374                             | 233           | 7              | 104           | 1,341          | 80,058         | 20,320          | 190          | 20,510        | 290             | 1,915         | 264          | 2,468         |             | 103,036        |
| Livermore                | 100                                |               |                | 284           | 58,923         | 59,307         | 88              | 2,063        | 2,151         |                 | 562           | 601          | 1,163         |             | 62,621         |
| Newark                   | 69                                 |               | 28,946         | 0             | 39             | 29,054         | 34              | 2            | 36            |                 | 0             | 225          | 225           |             | 29,315         |
| Oakland                  | 148,509                            | 7,635         |                | 76            | 3,451          | 159,671        | 21,664          | 242          | 21,905        |                 | 7,430         | 434          | 7,864         |             | 189,441        |
| Oro Loma SD              | INCLUDED IN Alameda Unincorporated |               |                |               |                |                |                 |              |               |                 |               |              |               |             |                |
| Piedmont                 | 39                                 | 135           |                |               | 9              | 183            | 69              |              | 69            |                 | 17            |              | 17            |             | 269            |
| Pleasanton               | 158                                |               |                | 8             | 94,690         | 94,856         | 297             | 985          | 1,282         |                 | 203           | 403          | 606           |             | 96,744         |
| San Leandro              | 31,752                             | 213           |                | 50            | 39,003         | 71,018         | 5,513           | 10           | 5,523         | 4,231           | 375           | 389          | 4,994         |             | 81,535         |
| Unincorporated           | 25,713                             | 175           |                | 756           | 3,236          | 29,879         | 3,471           | 185          | 3,656         | 358             | 1,164         | 181          | 1,703         | 262         | 35,499         |
| Union City               | 791                                |               | 34,342         | 2             | 69             | 35,204         | 74              | 2            | 76            |                 | 399           | 2,318        | 2,717         |             | 37,998         |
| <b>Total</b>             | <b>320,920</b>                     | <b>55,971</b> | <b>219,462</b> | <b>30,043</b> | <b>203,719</b> | <b>830,114</b> | <b>62,411</b>   | <b>3,986</b> | <b>66,397</b> | <b>4,879</b>    | <b>13,602</b> | <b>5,250</b> | <b>23,731</b> | <b>262</b>  | <b>920,503</b> |

- 1. Removed 4,000 tons of Special Waste disposed of at Altamont Landfill from City of Alameda
- 2. Removed 18,800 tons of MSW disposed of at Berkeley TS from City of Berkeley
- 3. Removed 20,662 tons of MSW disposed of at Altamont LF from City of Newark; and removed 27,357 tons of Special Waste disposed of at Altamont LF from City of Newark

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This study predates the recent building boom associated with new local and statewide housing policies, economic developments, and COVID-19 related renovation trends. It may also not capture cross-jurisdictional disposal of waste.

A snapshot for the twelve months preceding April, 2023 suggests a substantial increase in C&D as compared to StopWaste’s 2016 study. As reported through the City’s Green Halo Systems dashboard, C&D waste was more than 18,000 tons, a staggering 244% increase from 2016 levels. Of this material, the City reported that only 567 tons were

<sup>12</sup> Id.

<sup>13</sup> “Alameda County 2017-18 Waste Characterization Study.” StopWaste - A Public Agency Reducing Waste in Alameda County, StopWaste, 5 Sept. 2018, <https://www.stopwaste.org/resource/alameda-county-2017-18-waste-characterization-study>.

<sup>14</sup> Id.

reused while 2,530 tons were disposed (landfill), and 15,073 recycled.<sup>15</sup> The distribution of materials within each distinct material category is not clear. The Green Halo dashboard summarizes overall C&D by category over the same period as follows:

| MATERIAL                           | IN TONS   | RATE   |
|------------------------------------|-----------|--------|
| 1 Concrete                         | 10,839.63 | 58.74% |
| 2 Mixed C & D Debris               | 4,762.22  | 25.80% |
| 3 Asphalt - Pavement & Grinding    | 661.01    | 3.58%  |
| 4 Deconstructed & Reuse Items      | 567.24    | 3.07%  |
| 5 Bricks, Masonry & Stone Products | 474.15    | 2.57%  |
| 6 Dirt/Soil-Clean Fill             | 320.97    | 1.74%  |
| 7 Metal                            | 286.43    | 1.55%  |
| 8 Waste (Trash)                    | 207.81    | 1.13%  |
| 9 Drywall - Clean/Unpainted        | 198.87    | 1.08%  |
| 10 Wood - Clean                    | 136.52    | 0.74%  |

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### City of Berkeley’s Current Approach to C&D Waste

In furtherance of state law regulating C&D debris,<sup>17</sup> the Building and Safety Permit Service Center currently maintain a “Construction Waste Management Plan”<sup>18</sup> form applicable to the following projects:

1. Any non-residential projects requiring building permits.
2. Residential new buildings.
3. Residential projects that increase a building’s conditioned area, volume, or size.
4. Residential projects valued over \$100,000.
5. Demolition permits valued over \$3,000.

Projects are asked to disclose generally which methods they intend to use to reduce waste during construction:

<sup>15</sup> City of Berkeley Recycling Center, City of Berkeley, Powered by Green Halo Systems and City of Berkeley, 5 Apr. 2023, <https://berkeley.wastetracking.com/>.

<sup>16</sup> Id.

<sup>17</sup> A minimum of 65% of the waste generated by construction and demolition activities must be diverted away from landfill disposal through any combination of recycling, salvage, reuse or composting. 100% of asphalt, concrete, and land clearing debris must be recycled.

<sup>18</sup> Form #172 Construction Waste Management Plan - Berkeley, California. Building and Safety Permit Service Center, 19 Mar. 2021, <https://berkeleyca.gov/sites/default/files/2022-02/Waste%20Management%20Plan.pdf>.

**Construction Methods**

The following methods will be used to reduce waste generated during construction:

- Efficient design
- Careful and accurate material ordering
- Careful material handling and storage
- Panelized or prefabricated construction
- Deconstruction/salvage/reuse
- Other:  19

Applicants then complete a more detailed “Construction Waste Management Plan” through the Green Halo web platform.

In addition, the form asks for information about weight tickets for disposed and recycled materials and photos of any salvaged/reused materials. This data is then uploaded and processed via the City’s Green Halo dashboard.

**Diversion Documentation**

Submit a Construction Waste Management Plan via Green Halo at [www.berkeley.wastetracking.com](http://www.berkeley.wastetracking.com). Prior to permit final, weight tickets for all materials disposed and recycled must be uploaded. Photos are acceptable for salvaged/reused materials.

Green Halo Tracking Number:

I understand the waste diversion requirements of Berkeley Municipal Code Section 19.37 and submit this Construction Waste Management Plan pursuant to California Green Building Standards Code Section 4.408.2 or 5.408.1.1.

|                                          |                                          |                                          |
|------------------------------------------|------------------------------------------|------------------------------------------|
| <input style="width: 95%;" type="text"/> | <input style="width: 95%;" type="text"/> | <input style="width: 95%;" type="text"/> |
| Name                                     | Signature                                | Date                                     |

**Ordinance Overview: New Requirements**

Drawing inspiration from neighboring jurisdictions such as Palo Alto and Portland, the proposed ordinance moves beyond the state’s simple percentage-based diversion, recycling, and reuse requirements, and towards defining specific building components that are potentially reusable and requiring a salvage survey provided by the City, a reuse organization, or other third party approved by the City. These reporting requirements would need to be met prior to the issuance of a demolition permit. The survey is aimed at itemizing the potential materials and items eligible for salvage and reuse and the estimated weights, preparing the builder for source separation, and connecting builders directly to salvaging experts who may be able to connect the builder to organizations

<sup>19</sup> Id.

<sup>20</sup> Id.

who can accept or purchase their material for reuse. The size thresholds would remain the same as in the current statute.

This approach is more proactive than state rules, which rely on the judgment of the builder, to avoid incentivizing (1) more destructive techniques of traditional demolition, and (2) recycling instead of reuse. In addition, the City now only requires the builder to self-certify that disposed material was diverted after demolition occurs (as opposed to a detailed site survey that estimates weights before demolition occurs).

The ordinance also requires deconstruction, which is defined as “the systematic and careful dismantling of a structure, typically in the opposite order it was constructed, in order to maximize the salvage of materials and parts for reuse and recycling.”

Upon completion of the deconstruction and source separation of materials, the applicant or person responsible for the project shall ensure the items listed on the salvage survey are delivered to, collected by or received by, and certified by a reuse organization or other third party approved by the City, and shall submit to the City proof of delivery of salvage items in accordance with City regulations. This process creates a chain of custody of environmentally, labor, and carbon intensive resources, and incentivizes builders to prioritize designs and projects that minimize demolition in favor of adaptation.

In addition, this item includes a referral to the City Attorney’s office to conduct a nexus fee study in connection with a potential social cost of carbon fee applied to landfilled construction and demolition debris.

#### FISCAL IMPLICATIONS

Staff time will be needed to administer and enforce the ordinance, and to coordinate with approved salvage operations.

#### ENVIRONMENTAL SUSTAINABILITY

Restoring or adapting embodied carbon in buildings is significantly less carbon intensive than demolition and new construction. In instances where restoration and adaptation are not feasible, reuse of materials through deconstruction is superior to traditional demolition techniques.

#### CONTACT PERSON

Councilmember Kate Harrison, Council District 4, (510) 981-7140

ORDINANCE NO. –N.S.

ADDING CHAPTER 12.39 TO THE BERKELEY MUNICIPAL CODE TO REGULATE  
DECONSTRUCTION AND CONSTRUCTION MATERIALS MANAGEMENT

BE IT ORDAINED by the Council of the City of Berkeley as follows:

Section 1. That Chapter 12.39 of the Berkeley Municipal Code is added to read as follows:

**Chapter 12.39**

**DECONSTRUCTION AND CONSTRUCTION MATERIALS MANAGEMENT**

**Sections:**

- 12.39.010 Findings and purpose.**
- 12.39.020 Definitions.**
- 12.39.030 Applicability.**
- 12.39.040 Salvage survey and reuse required.**
- 12.39.050 Deconstruction and source separation of materials.**
- 12.39.060 Material collection**
- 12.39.070 No unauthorized containers.**
- 12.39.080 Exclusions.**
- 12.39.090 Administration by City Manager.**
- 12.39.100 Enforcement and penalties.**
- 12.39.110 Severability.**
- 12.39.120 Construction.**
- 12.39.130 Effective Date.**

**12.39.010 Findings and purpose.**

The Council of the City of Berkeley finds and declares as follows:

- A. The accumulation, collection, removal and disposal of waste associated with construction, deconstruction and demolition activities must be controlled for the protection of the public health, safety and welfare, and the natural environment.
- B. State law addresses this need through the California Integrated Waste Management Act of 1989 and the California Green Building Code, which requires local governments to require fifty percent of construction debris be diverted from the landfill, and Senate Bill 1374, which requires annual reporting to the state on progress made in the diversion of construction related materials, including information on programs and ordinances implemented and quantitative data, where available. Required minimum diversion rates by project type are covered under the California Green Building Code and the City's local amendments in Title 19, Buildings and Construction, of this code.
- C. The City's Solid Waste Management Plan (1996 and 2000), the Source Reduction and Recycling Element (1992) and the Climate Action Plan (2009) are the City's most recent documents guiding the City's efforts toward its goal of zero waste.
- D. In 2005, the City Council adopted a Zero Waste Goal to eliminate Berkeley's materials sent to landfills by the year 2020. The Resolution and Goal reference a goal of 90% and 100% for the diversion of all materials being landfilled. Since 2012, there has been continuous year to year overall increase of disposal tonnage and with the ongoing market conditions for recyclable materials, the achievement of this Goal proved unattainable by 2020.
- E. In 2019, the Council adopted amendments to Chapter 4 of the California Green Buildings Code to require recycling and/or salvage for reuse requirements for most non-residential and substantial residential construction projects of 100% of excavated soil and land-clearing debris, 100% of concrete, and 100% of asphalt, and 65% of all non-hazardous construction and demolition waste.
- F. Between 2021 and 2022 the City and its partners processed more than 53,000 tons of construction and demolition materials with a reported 77.15% recovery rate.
- G. At the same time, Berkeley's construction and demolition processing facility reported that as of November 2022, 62.78% of demolition debris and 57.42% of facility-wide construction and debris was used as alternative daily cover for landfills, representing an inefficient use of embodied carbon.
- H. The City may adopt, implement, and enforce requirements, rules and regulations for local reuse and recycling of materials that are more stringent or comprehensive than California law, and this chapter establishes local requirements to further both state law and the City's adopted policies.
- I. This chapter's goals are to implement best practice methods for separation, handling, and delivery of deconstruction and construction site materials to maximize the salvage of building materials for reuse, to reduce the amount of construction and deconstruction related materials disposed in landfills and to establish deconstruction and source separation requirements.
- J. The requirements of this chapter are in addition to, the requirement in Chapter 19.37.040 of this code to achieve a specified diversion of materials generated from an applicable construction project.

**12.39.020 Definitions.**



For purposes of this chapter, terms defined in Chapter 12.32 shall have the same meanings in this chapter. The following terms shall have the ascribed definition for the purposes of applying the criteria of this chapter and other chapters as referenced.

A. "Approved facility" means a reuse, recycling, composting, or materials recovery facility which the director has determined can accept diverted materials, has obtained all applicable federal, state and local permits, and is in full compliance with all applicable regulations for reuse, recycling, composting, and/or materials recovery.

B. "Applicant" means (a) any individual, firm, limited liability company, association, partnership, political subdivision, government agency, municipality, industry, public or private corporation, or any other entity whatsoever who applies to the City for, or who is issued, the applicable permits to undertake a construction, expansion, remodeling, or demolition project within the City of Berkeley, and (b) the owner of the real property that is subject to the permit.

C. "Construction and demolition debris" or "construction and deconstruction materials" means (a) discarded materials generally considered to be non-water soluble and non-hazardous in nature (as defined by California Code of Regulations, Title 22, § 66261.3 et seq.), including but not limited to, metal, glass, brick, concrete, porcelain, ceramics, asphalt, pipe, gypsum wallboard, and lumber from the construction or destruction of a structure as part of a construction or demolition project or from the renovation of a structure and/or landscaping, including rocks, soil, trees, and other vegetative matter that normally results from land clearing, landscaping and development operations for a construction project; and (b) remnants of new materials, including but not limited to, cardboard, paper, plastic, wood, glass and metal from any construction, renovation and/or landscape project.

D. "Contractor" means any person or entity holding, or required to hold, a contractor's license under the laws of the State of California, and who performs any construction, deconstruction, demolition, remodeling, renovation, or landscaping service relating to buildings or accessory structures in the City.

E. "Covered project" means any project that is required to comply with the provisions of this chapter, as described in Section 12.39.030.

F. "Deconstruction" means the systematic and careful dismantling of a structure, typically in the opposite order it was constructed, in order to maximize the salvage of materials and parts for reuse and recycling.

G. "Demolition" means the partial or complete destroying, tearing down, dismantling or wrecking of any building or structure.

H. "Diversion" means any activity, including recycling, source reduction, reuse, deconstruction, or salvaging of materials, which causes materials to be diverted from disposal in landfills and instead puts the material to use as the same or different usable product.

I. "Recycling" means the process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste, and returning them to the economic mainstream in the form of raw material for new or reconstituted products which meet the quality standards necessary to be used in the marketplace. This term does not include transformation as that term is defined in Public Resources Code section 40180.

J. "Reuse" means further or repeated use of materials or items, including sale or donation of items, but not including recycling.

K. "Reuse organization" means an organization approved by the City to provide salvage surveys and accept materials or items for reuse.

L. "Salvage" means the controlled removal of items and material from a building, construction, or demolition site for the purpose of on- or off-site reuse, or storage for later reuse. Examples of items that may be salvaged include air conditioning and heating systems, columns, balustrades, fountains, gazebos, molding, mantels, pavers, planters, quoins, stair treads, trim, wall caps, bath tubs, bricks, cabinetry, carpet, doors, ceiling fans, lighting fixtures, electrical panel boxes, fencing, fireplaces, flooring materials of wood, marble, stone or tile, furnaces, plate glass, wall mirrors, door knobs, door brackets, door hinges, marble, iron work, metal balconies, structural steel, plumbing fixtures, refrigerators, rock, roofing materials, siding materials, sinks, stairs, stone, stoves, toilets, windows, wood fencing, lumber and plywood.

M. "Source separated single recyclable materials" means recyclable materials that are separated from other recyclable materials or solid waste and placed in separate containers according to type or category of materials and directly marketed as a single commodity.

#### **12.39.030 Applicability**

This chapter shall be applicable to all residential and commercial projects that include a whole structure demolition requiring a demolition permit. However, this chapter shall not apply to any project for which the completed demolition permit application was submitted to the City prior to [x].

#### **12.39.040 Salvage survey and reuse required.**

A. All applicants and other persons who undertake a covered project shall complete a salvage survey provided by the City, a reuse organization, or other third party approved by the City, prior to the issuance of a demolition permit. The survey shall itemize the materials and items eligible for salvage and reuse and the estimated weights.

B. Upon completion of the deconstruction and source separation of materials, the applicant or person responsible for the covered project shall ensure the items listed on the salvage survey are delivered to, collected by or received by, and certified by a reuse organization or other third party approved by the City, and shall submit to the City proof of delivery of salvage items in accordance with City regulations.

#### **12.39.050 Deconstruction and source separation of materials.**

A. All applicants and other persons who undertake a covered project where materials can be recycled or composted shall deconstruct buildings and structures in a manner to divert the maximum feasible amount of materials and debris from disposal in landfills. All construction and deconstruction materials shall be source separated. Materials to be source separated for recycling include, but are not limited to, steel, glass, brick, concrete, asphalt, roofing material, pipe, gypsum, sheetrock, lumber, wood, pallets, rocks, sand, soil, clean cardboard, paper, plastic, carpet, wood and metal scraps. Materials to be composted include, but are not limited to, trees, shrubs, plant cuttings, food scraps, and other material as designated by the City.

B. All persons undertaking a covered project shall submit proof of reuse, recycling and composting in accordance with City regulations.

C. The City, or its collector at City's direction, shall be authorized to inspect, upon reasonable notice, and audit individual waste streams generated at covered projects to determine compliance with this section.

**12.39.060 Material collection.**

Projects using a container provided by the City's collector pursuant to the provisions of Chapter 12.32 shall be deemed to have complied with the requirement to take construction and deconstruction related waste and source separated materials to an approved facility. Persons using any other method of collection shall dispose of such debris at an approved facility in accordance with City regulations.

**12.39.070 No unauthorized containers.**

No person other than the City's collector may place containers within the City of Berkeley.

**12.39.080 Exclusions.**

The provisions of this chapter shall not apply to the following:

- A. Dangerous Structures. Any building or structure that has been determined by the City to be dangerous, structurally unsafe or otherwise hazardous to human life, and is required to be abated by demolition.
- B. No Suitable Materials. Any building or structure that does not have materials that are suitable for reuse, recycling, or compost, as determined by the Director of Public Works. Materials unsuitable for reuse, recycling, or compost include insulation, painted or treated wood, rubber, and non-recyclable plastics.
- C. De Minimus Exception. The Director of Public Works may waive any of the requirements of this chapter if documentation satisfactory to the director is provided to establish that the materials are not reusable, recyclable or compostable, the materials are incidental in quantity, or providing appropriate containers at the particular site would be unduly difficult.

**12.39.090 Administration by City Manager.**

- A. The City Manager shall adopt written rules and regulations, not inconsistent with this chapter, as may be necessary for the proper administration and enforcement of this chapter.
- B. The City Manager shall resolve all disputes concerning the administration or enforcement of this chapter, and their decision shall be final.

**12.39.100 Enforcement and penalties**

- A. The Director of Public Works shall have primary responsibility for enforcement of this chapter. The Director of Public Works is authorized to take any and all other actions reasonable and necessary to enforce this chapter.
- B. Violation of any provision of this chapter shall be subject to the provisions and penalties set forth in Title 1 of the Municipal Code unless otherwise specified.
- C. The remedies and penalties provided in this section are cumulative and not exclusive.

**12.39.110 Severability.**

If any word, phrase, sentence, part, section, subsection, or other portion of this Chapter, or any application thereof to any person or circumstance is declared void,

unconstitutional, or invalid for any reason, then such word, phrase, sentence, part, section, subsection, or other portion, or the prescribed application thereof, shall be severable, and the remaining provisions of this Chapter, and all applications thereof, not having been declared void, unconstitutional or invalid, shall remain in full force and effect. The City Council hereby declares that it would have passed this title, and each section, subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases had been declared invalid or unconstitutional.

**12.39.120 Construction.**

This Chapter is intended to be a proper exercise of the City's police power, to operate only upon its own officers, agents, employees and facilities and other persons acting within its boundaries, and not to regulate inter-City or interstate commerce. It shall be construed in accordance with that intent.

Section 2. Copies of this Ordinance shall be posted for two days prior to adoption in the display case located near the walkway in front of the Maudelle Shirek Building, 2134 Martin Luther King Jr. Way. Within 15 days of adoption, copies of this Ordinance shall be filed at each branch of the Berkeley Public Library and the title shall be published in a newspaper of general circulation.



Kate Harrison  
Councilmember District 4

ACTION CALENDAR  
November 30, 2021

To: Honorable Mayor and Members of the City Council  
From: Councilmember Harrison  
Subject: Adopt an Ordinance Adding a New Chapter 12.01 to the Berkeley Municipal Code Establishing Emergency Greenhouse Gas Limits, Process for Updated Climate Action Plan, Monitoring, Evaluation, Reporting and Regional Collaboration

RECOMMENDATION

1. Adopt an ordinance adding a new Chapter 12.01 to the Berkeley Municipal Code (BMC) establishing Emergency Greenhouse Gas Limits with an effective date of [ ], 2022.
2. Refer to the FY23-24 Budget Process \$[ ] consistent with implementing the requirements of Sections 12.01.040, 12.01.050, 12.01.060.

CURRENT SITUATION, EFFECTS, AND RATIONALE FOR RECOMMENDATION

Scientific evidence indicates that between the industrial period of 1850 and 2021, economic systems, namely state and free-market forms of capital accumulation and economic growth have increased global atmospheric carbon dioxide levels to a staggering 418 parts per million (ppm), beyond the established planetary boundary of 350 ppm, and warmed global average temperature by approximately 1.1 degrees Celsius. Available scientific evidence indicates there is no 'safe' level of warming beyond 350 ppm, only gradations of risk with respect to habitability.

Berkeley is already experiencing unprecedented negative effects of warming associated with 1 degree of warming, and current global growth trends and policies could push humanity past 1.5 degrees by mid-century, leading to a devastating 2-4 degrees by the end of the century. The 'Global North,' which includes Berkeley, has far exceeded its fair share of the emissions comprising and exceeding the boundary, and must reduce its emissions rapidly and justly.

The City of Berkeley has engaged with the issue of global warming for at least three decades and has unquestionably been a leader in certain climate actions. Yet, in light of the current gravity of the climate emergency, current strategies and targets are not adequate. Exceptionally risky “mitigation” strategies, namely midcentury ‘net-zero’ pledges have provided for unbridled economic and emissions growth and thus severely dwindled carbon budgets, effectively rendering Berkeley’s gradual reduction goals: 80% by 2050 (Measure G, 2005 and Resolution 64,480-N.S., 2009) and net-zero by 2045 (Resolution 69,852–N.S., 2021), untenable. The majority of risk associated with each additional ton of greenhouse gas emitted will be borne by generations who will have not consented to current reduction goals and strategies. Current policies could exacerbate or lead to exceedingly dangerous new tipping points.

This item is timely in light of ongoing reports that national “pledges” under Paris Agreement could lead to at least 3 degrees of catastrophic warming, the inability for Congress to pass meaningful domestic and international climate policies and legislation, and the failure of world leaders to reach an effective and substantive agreement at the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow.

#### BACKGROUND

The ordinance establishes emergency greenhouse gas limits aimed at reducing sector-based greenhouse gas emissions 90% below 2000 levels and consumption-based emissions 90% below 2013 levels by 2030. These limits would bring Berkeley closer to its global ‘fair share’ and science-based reduction obligations, and could help achieve reductions at scale as part of a program of regional coordination and collaboration.

While such targets are ambitious, mitigating and minimizing global warming risk and maximizing adaptation, resilience and adherence to planetary boundaries earlier in the century rather than later will likely result in less disruption to society over the long term, and will generate opportunities for more inclusive and sound democratic decision making as compared to waiting until atmospheric carbon levels reach increasingly catastrophic levels.

These limits are consistent with the City’s 2006 “precautionary principle” established by BMC 12.29, and which states:

“The purpose of this chapter is to promote the health, safety, and general welfare of the community by minimizing health risks, improving air quality, protecting the quality of ground and surface water, minimizing consumption of resources, and minimizing the City’s contribution to global climate change by implementing in a phased manner, as provided in this chapter, the City’s use of a precautionary principle approach in its decisions.”

As enacted by Council, BMC 12.29 requires the City to apply the following precautionary principle tenets in the course of action and decision-making:

1. Anticipatory Action: Anticipatory action may prevent harm. Government, business, community groups, and the public share this responsibility.

2. Right to Know: The community has a right to know complete and accurate information on potential health and environmental impacts associated with the selection of products, services, operations or plans.
3. Alternatives Assessment: Examine a full range of alternatives and select the alternative with the least potential impact on health and the environment including the alternative of doing nothing.
4. Consideration of Significant Costs: Consider significant short-term and long-term costs in comparing product alternatives, when feasible. This includes evaluation of significant costs expected during the lifetime of a product, (e.g. raw materials, manufacturing and production, transportation, use, clean-up, acquisition, extended warranties, operation, supplies, maintenance, disposal costs, long and short-term environmental and health impacts); and that expected lifetime compared to other alternatives.
5. Participatory Decision Process: Decisions applying the Precautionary Principle should be transparent, participatory by including community input, and informed by the best available information.

The ordinance requires the City to develop a new Climate Action Plan and consistent with these GHG limits and precautionary principle tenets, and to establish relevant legislative and budgetary timelines to help the City reach its objectives.

In addition, the ordinance requires the City to consider post-growth climate mitigation strategies and policies as potential alternatives to the growth and market-based and other policies that created the crisis and remain a persistent obstacle to meaningful action. The City's policies and programs *must not* aim to merely increase economic growth for growth's sake, but rather to support the provision of basic human needs and happiness.

It also provides an institutional framework to build solidarity with neighboring Bay Area communities and jurisdictions to achieve collective limits that could change rate of global warming while simultaneously providing sister cities in other countries precious time to improve living standards and pursue decarbonization.

#### ENVIRONMENTAL SUSTAINABILITY

This item is consistent with the latest climate science and the precautionary principle established by BMC 12.29.

#### ATTACHMENTS

1. Proposed Ordinance adding a new Chapter 12.01.

FINANCIAL IMPLICATIONS

Staff time will be necessary to implement the new ordinance. This item refers \$[ ] to the FY23-24 Budget Process consistent with implementing the requirements of Sections 12.01.040, 12.01.050, 12.01.060.

CONTACT PERSON

Councilmember Kate Harrison, Council District 4, (510) 981-7140



ORDINANCE NO. –N.S.

ADDING CHAPTER 12.01 TO THE BERKELEY MUNICIPAL CODE TO ESTABLISH  
EMERGENCY GREENHOUSE GAS EMISSIONS LIMITS

BE IT ORDAINED by the Council of the City of Berkeley as follows:

Section 1. That Chapter 12.01 of the Berkeley Municipal Code is added to read as follows:

**Chapter 12.01**

**EMERGENCY GREENHOUSE GAS EMISSIONS LIMITS**

**Sections:**

**12.01.010 Findings and purpose.**

**12.01.020 Definitions.**

**12.01.030 Greenhouse Gas Emissions Limits.**

**12.01.040 Climate Action Plan.**

**12.01.050 Monitoring, Evaluation, And Reporting.**

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**12.01.070 Severability.**

**12.01.080 Construction.**

**12.01.090 Effective date.**

**12.01.010 Findings and purpose.**

The Council of the City of Berkeley finds and declares as follows:

- A. Available scientific evidence indicates that between the industrial period of 1850 and 2021 economic systems, namely state and free-market forms of capital accumulation and economic growth, have increased global atmospheric carbon dioxide levels to a staggering 418 parts per million (ppm) beyond the established planetary boundary of 350 ppm, and warmed global average temperature by approximately 1.1 degrees Celsius. The 'Global North,' which includes Berkeley, has far exceeded its fair share the emissions comprising and exceeding the boundary, and must reduce its emissions rapidly and equitably.
- B. Available scientific evidence indicates there is no 'safe' level of warming beyond 350 ppm, only gradations of risk with respect to habitability. Berkeley, California, the United States, and the world is already experiencing unprecedented negative effects of warming associated with 1 degree of warming, and current global growth trends and policies will push humanity past 1.5 degrees as early as the 2030s and 3 to 4 degrees by the end of the century. Global warming between 1.5 to 2 degrees Celsius is expected to further accelerate existential risks to health and safety including but not limited to, extreme weather, mass extinction, water and food shortages, violent conflict, fire, forced migration, economic collapse, disease, heat stress, and sea level rise. The majority of risk associated with each additional ton of greenhouse gas emitted will be borne by generations who will have not consented to current reduction strategies.
- C. In the twenty-first century, Berkeley, California, and the United States have largely and irresponsibly relied on ineffective market-based mechanisms, unrealistic expectations of absolutely decoupling GDP growth from energy use, speculative mass deployment of negative emission reduction technologies and 'net-zero' practices to offset continued fossil fuel production and consumption, and underappreciation of irreversible tipping points, aerosol masking, and non-carbon greenhouse gasses. In light of the current gravity of the climate emergency, these strategies have unequivocally failed; between Measure G and 2018, each jurisdiction only reduced greenhouse gasses by a respective 10%, 12%, and 26%, while at the same time globally, nearly a third of all anthropogenic carbon dioxide was emitted. Exceptionally risky strategies pursued by the Global North, namely midcentury 'net-zero' pledges have provided for unbridled economic and emissions growth and thus severely dwindled carbon budgets, effectively rendering Berkeley's gradual reduction goals: 80% by 2050 (Measure G, 2005 and Resolution 64,480-N.S., 2009) and net-zero by 2045 (Resolution 69,852-N.S., 2021), untenable.
- D. It is the intent of the Council to adopt stringent and equitable science-based greenhouse gas emissions limits and related action plans and reports, consistent with the precautionary principle approach established by Chapter 12.29, for the purpose of achieving the rapid, far-reaching, unprecedented and just changes in all aspects of society associated with mitigating and minimizing global warming risk and maximizing adaptation, resilience and adherence to planetary boundaries.
- E. The Council further intends to endeavor to build solidarity with neighboring communities and jurisdictions to achieve collective limits that could change rate of global warming while simultaneously providing sister cities in other countries precious time to improve living standards and pursue decarbonization.

**12.01.020 Definitions.**

A. "Climate Action Plan" means the document required under Section 12.01 outlining the specific actions the City will endeavor to take to reduce Greenhouse gas emissions and to mitigation, resilience and adaptation efforts with respect to climate impacts.

B. "Consumption-Based Greenhouse Gas Emissions" means all the Greenhouse Gas emissions associated with producing, transporting, using, and disposing of products and services consumed by a particular community or entity in a given time period, including emissions generated outside the boundaries of the community or the geographic area where the entity is located.

C. "Greenhouse Gas" means any and all of the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.

D. "Sector-Based Greenhouse Gas Emissions" means all of the Greenhouse Gas emissions generated within the geographic boundaries of the City in a given time period.

E. "Responsible Production and Consumption" means improving how materials and products are extracted, manufactured, delivered, acquired, used, reused, recycled, and disposed of to ensure that the production and consumption of materials and products promote basic human needs, are distributed in a socially equitable manner, and carried out in a way that minimizes environmental impacts over the lifecycle of those materials and products while matching the carrying capacity of the earth's resources and adding value so as not to jeopardize present and future generations. "Lifecycle" means the complete material life of a product, good, or service, including resource extraction, manufacture, assembly, construction, maintenance, transportation, operations or use, and end of life (reuse, recycling/composting, and disposal). "Carrying capacity" means the number or amount of people, plants, and other living organisms that an ecosystem can support indefinitely without causing environmental degradation.

F. "Post-Growth Emissions Mitigation" means Greenhouse Gas mitigation strategies and policies that acknowledge and support the following:

(1) rapid emissions reductions may not be compatible with economic policies that support limitless growth, especially growth in the production and consumption of commodities that do not support basic human needs,

(2) in jurisdictions with high aggregate wealth there may be a disassociation between additional capital accumulation, economic growth, and GDP, and key social outcomes, to include but not limited to, health, social wellbeing, happiness and equity,

(3) fairer distribution of income and wealth, and guaranteed access to universal public services.

**12.01.030 Emergency Greenhouse Gas Emissions Limits.**

A. The following Greenhouse Gas emissions limits are hereby established:

(1) By 2030, reduce Sector-Based Greenhouse Gas Emissions [90%] below 2000 levels.

(2) By 2030, reduce Consumption-Based Greenhouse Gas Emissions to [5] mtCO<sub>2</sub>e per household or less, equivalent to a [90%] reduction compared to 2013 levels.

(3) By 2026, the Council shall determine an appropriate deadline for achieving 100% zero emissions across both Sector and Consumption-Based inventories.

**12.01.040 Climate Action Plan.**

A. By [ ], 2022, the City Manager or designee shall prepare and submit for relevant Council policy committee and Council approval a Climate Action Plan (CAP) which shall

do all of the following:

- (1) Align with the emissions limits established in Section 12.01.030.
  - (2) Consider equitable Post-growth Climate Mitigation strategies and policies.
  - (3) Incorporate an equity framework that addresses historic racial, class-based, and social inequalities; prioritizes social, economic, and environmental benefits derived from implementing the CAP; and ensures an equitable distribution of those benefits. This framework shall consider:
    - (a) The engagement and prioritization of those who are most impacted by climate change and have historically had the least influence in decision-making processes, including low-income communities of color, communities with disabilities, and other impacted populations;
    - (b) Burdens and/or unintended consequences of related actions, especially for low-income communities of color, communities with disabilities, and other vulnerable populations; and
    - (c) Social interventions needed to secure workers' rights and livelihoods when economies are shifting to responsible production and consumption, collectively referred to as a "just transition" framework, and other impacts on workforce and job opportunities.
  - (4) Include, but not be limited to, the following elements: energy supply; transportation and land use; building operations; housing; Responsible Production and Consumption; carbon sequestration and water conservation.
  - (5) Identify strategies and/or make recommendations to achieve emissions limits for all elements. The CAP shall recommend approaches on goals and principles. Each strategy or recommendation shall:
    - (a) Identify parties responsible for implementation;
    - (b) Incorporate an estimated cost; and
    - (c) Incorporate estimated legislative and budgetary timelines based consistent with Section 12.01.030; and
    - (d) Contain key performance indicators and explicit equity metrics to measure progress.
- B. The City Manager or their designee shall update the Climate Action Plan at least every two years.

#### **12.01.050 Monitoring, Evaluation, And Reporting.**

- A. The City shall demonstrate its long-term commitment to reducing Greenhouse Gas emissions and advancing racial and social equity by measuring and reporting emissions, tracking key performance indicators and equity metrics, and monitoring the City's progress on meeting its climate action goals and commitments.
- B. The City Manager or their designee shall, with the assistance from relevant City agencies:
  - (1) Measure and monitor Sector-Based Greenhouse Gas Emissions, including municipal emissions, using best available global protocols for preparing Citywide Greenhouse Gas emission inventories.
  - (2) Measure production and consumption emissions using best available global methodologies for preparing consumption-based emission inventories.
  - (3) Evaluate Sector-Based Greenhouse Gas Emissions against set limits, document production and consumption emissions, and produce an annual Greenhouse Gas emissions report.
  - (4) Establish a monitoring and reporting process for the implementation of the CAP that:
    - (a) Tracks key performance indicators and equity metrics for strategies to help

monitor their progress and implementation;

(5) Request and receive data from City departments to support:

(a) The annual Greenhouse Gas emissions inventory. City departments may be asked to provide data on, but not limited to, the following: their energy use; types of fuels used for their operations; fuel volume; vehicle-miles travelled (if applicable) within their jurisdictions; and private sector Greenhouse Gas emission sources regulated by the department. Departments may also be requested to verify emission estimates and assumptions and review resulting reports;

(b) Monitoring and reporting of Climate Action Plan implementation. City departments may be asked to provide data on key performance indicators and equity metrics related to adopted strategies and actions; and

(6) Coordinate with other City agencies to monitor, track, and report on climate action progress to local, state, national, and global partners.

(7) Report its findings in a progress report to the Council and public every year.

(8) Report on at least a biannual basis to relevant Council policy committees and commissions to support policy and budget development consistent with reduction limits established in Section 12.01.030.

#### **12.01.060 Regional Collaboration.**

The Council and City staff, working alongside the public, shall endeavor to build solidarity and coalitions with neighboring communities, jurisdictions, and agencies to achieve equitable collective Greenhouse Gas limits and observe planetary boundaries.

#### **11.63.070 Severability.**

If any word, phrase, sentence, part, section, subsection, or other portion of this Chapter, or any application thereof to any person or circumstance is declared void, unconstitutional, or invalid for any reason, then such word, phrase, sentence, part, section, subsection, or other portion, or the prescribed application thereof, shall be severable, and the remaining provisions of this Chapter, and all applications thereof, not having been declared void, unconstitutional or invalid, shall remain in full force and effect. The City Council hereby declares that it would have passed this title, and each section, subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases had been declared invalid or unconstitutional.

#### **12.01.080 Construction.**

This Chapter is intended to be a proper exercise of the City's police power, to operate only upon its own officers, agents, employees and facilities and other persons acting within its boundaries, and not to regulate inter-city or interstate commerce. It shall be construed in accordance with that intent.

#### **12.01.090 Effective date.**

The provisions in this ordinance are effective [ ], 2022.

Section 2. Copies of this Ordinance shall be posted for two days prior to adoption in the display case located near the walkway in front of the Maudelle Shirek Building, 2134 Martin Luther King Jr. Way. Within 15 days of adoption, copies of this Ordinance shall be

filed at each branch of the Berkeley Public Library and the title shall be published in a newspaper of general circulation.