



Office of the City Manager

INFORMATION CALENDAR  
December 12, 2023

To: Honorable Mayor and Members of the City Council  
From: Dee Williams-Ridley, City Manager  
Submitted by: Jordan Klein, Director, Department of Planning and Development  
Subject: Climate Action Plan and Resilience Update

SUMMARY

This report contains performance metrics to measure progress toward meeting climate action goals in the transportation and building sectors. Alongside GHG emission reductions, staff is advancing equity, prioritizing community resilience, helping the community adapt to the changing climate, and will be utilizing funding from the California Office of Planning and Research Adaptation Planning Grant Program starting in 2024 to collaborate with disadvantaged communities to develop meaningful metrics to measure Berkeley's progress in advancing climate, equity and resilience goals.

Based on the best currently available data from 2021, the Berkeley community has reduced overall greenhouse gas (GHG) emissions by 25% since 2000. In addition to a declining trend since 2000, there was a significant drop in 2020 due to the impacts of the COVID-19 pandemic, particularly in the transportation sector. As anticipated, in 2021 as people resumed commute and travel patterns the transportation emissions increased by 27% from 2020 levels, though the 2021 transportation emissions are still 9% lower than in 2019. In Berkeley's building sector, emissions decreased by 7% from 2020 to 2021. Further declines in community-wide building sector emissions are anticipated in 2022, which is when most residential and commercial electricity accounts transitioned to Ava Community Energy's (formerly known as East Bay Community Energy's) Renewable 100 product. Ava Community Energy (Ava) has also pledged to make its Bright Choice product emissions-free by 2030.

Although Berkeley has made significant progress in reducing GHG emissions, additional work is required to achieve the City's ambitious goals. In 2006, Berkeley residents voted to reduce the community's GHG emissions by 80% below 2000 levels by 2050, and the resulting Climate Action Plan (CAP) was adopted by the Berkeley City Council in 2009. In 2018, then-Governor Brown committed California to carbon neutrality by 2045, the Berkeley City Council resolved to become a "Fossil Fuel-Free City," and the Council declared a Climate Emergency, all steps to signal the urgency of these ambitious goals and the need to act on climate threats in an equitable manner. Additionally, in 2020, Berkeley City Council established a 2030 GHG emission reduction target that reflects

Berkeley's fair share of the 50% global reduction in carbon dioxide equivalent (CO<sub>2</sub>e), committing to reduce emissions 60.5% from 2018 levels by 2030. Berkeley's emission reduction and fossil fuel-free goals were set in the context of a growing population, so the 2021 emissions reductions were achieved with an 18% increase in population from the 2000 baseline.

### CURRENT SITUATION AND ITS EFFECTS

Berkeley's progress on climate action and the annual community-wide GHG emissions inventory is a Strategic Plan Priority Project, advancing our goal to be a global leader in addressing climate change, advancing environmental justice, and protecting the environment.

City staff annually calculate community GHG emissions to understand which sectors and fuels contribute the most emissions in Berkeley, track progress toward climate goals, and provide data that can be used for prioritizing programs and policies. Berkeley's community-wide GHG emissions in 2021 totaled 546,388 metric tons of carbon dioxide equivalent (mtCO<sub>2</sub>e). The 2021 GHG inventory continued to be impacted by the global COVID-19 pandemic, as noted within each sector's analysis.

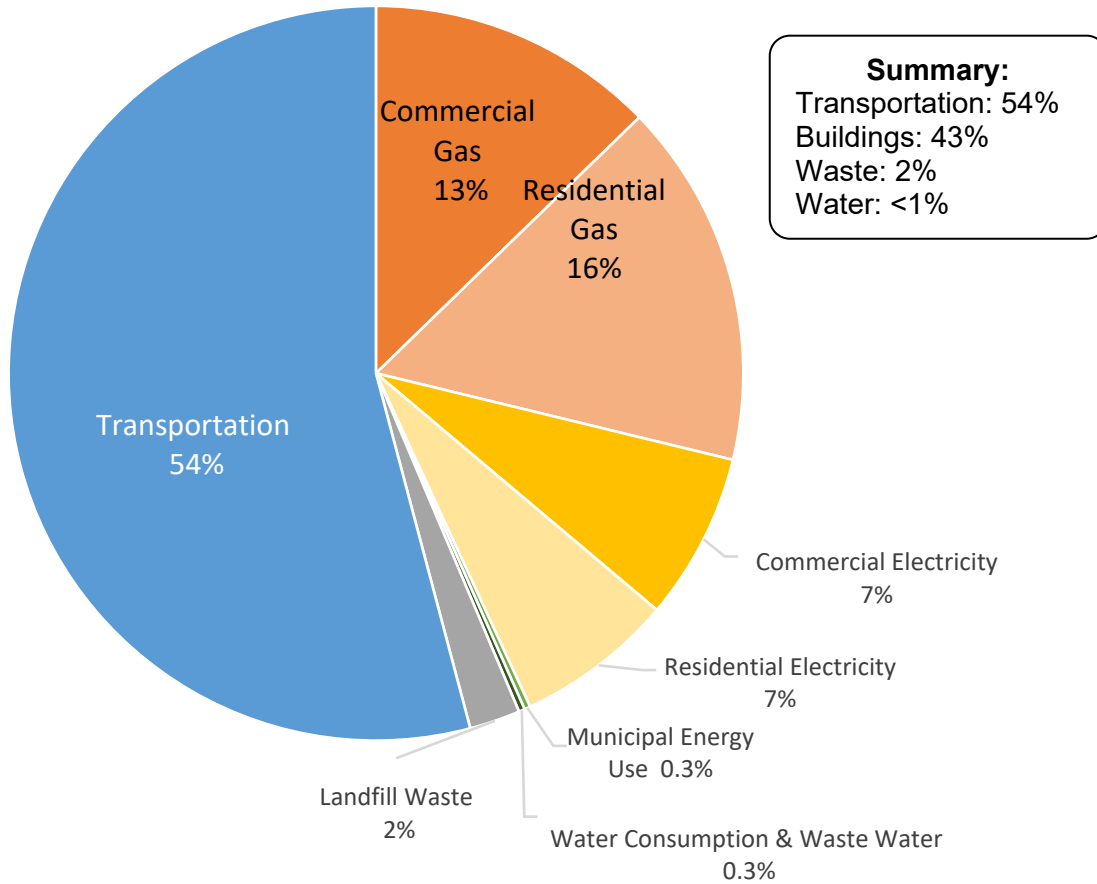
**Figure 1** is a pie chart of the 2021 community-wide GHG emissions inventory, the most recent available data, broken down by sector and fuel. The majority of Berkeley's GHG emissions continue to come from the transportation and building sectors.

The transportation sector was the largest source of 2021 GHG emissions, accounting for 54% (295,777 mtCO<sub>2</sub>e) and includes vehicles, BART, AC Transit, Amtrak and maritime vessels. The building sector was the second largest source of emissions in 2021 and accounted for 43% (236,973 mtCO<sub>2</sub>e) of community-wide emissions. Energy usage data for Berkeley buildings, provided by Ava and PG&E, is broken down into residential and commercial (including industrial) buildings—for both electricity use and natural gas (gas) combustion.

Emissions from municipal energy use accounts for 0.3% (1,434 mtCO<sub>2</sub>e) of the 2021 community-wide GHG emissions. Municipal energy consumption includes city buildings and other uses like streetlights and traffic signals. The remaining 2% (13,639 mtCO<sub>2</sub>e) of Berkeley's community-wide GHG emissions come from landfilled solid waste, water consumption, and waste water treatment.

Figure 1: 2021 community-wide GHG emissions inventory, by sector and fuel.

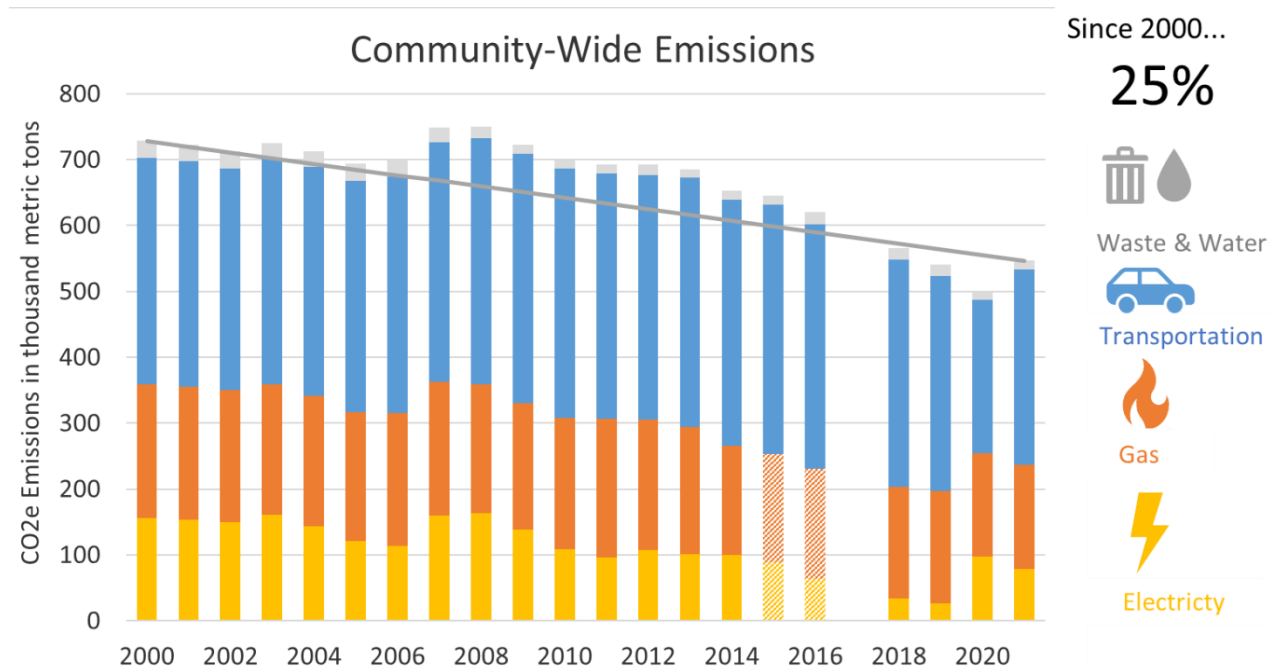
## 2021 Greenhouse Gas Inventory



To identify and quantify reductions achieved, the most current community emissions from 2021 are compared to the Climate Action Plan (CAP) baseline year of 2000. A historic summary of Berkeley’s annual emissions inventories from 2000 to 2021 is provided in **Figure 2**<sup>1</sup>.

<sup>1</sup> Due to data access issues, the City was not provided with energy use data in 2015 and 2016, so building energy usage was estimated using assumptions and is represented with shaded coloring. No inventory was calculated for 2017, so that year of data is omitted.

**Figure 2: Historic Berkeley GHG emissions inventories back to 2000, broken out into building electricity and gas combustion, transportation, and other (water, wastewater treatment and landfill solid waste).**



Community-wide GHG emissions in 2021 decreased 25% from the 2000 baseline. As mentioned, due to the COVID-19 pandemic GHG emissions in 2020 were very low. In 2021 GHG emissions increased 9% from the dip in 2020, and increased 1% from 2019, the most recent pre-pandemic year. Berkeley’s original CAP goal of reducing GHG emissions by 80% from 2000 levels by 2050 was superseded by a commitment by the Berkeley City Council on May 11, 2021, to become zero net emissions by 2045 or sooner, requiring an additional 75% reduction of GHG emissions over the next 24 years.

Key accomplishments and examples of work underway to reduce GHG emissions and address the climate emergency are described below. Although the data for GHG emissions is for the calendar year of 2021, the progress on programs described in the following sections includes more recent efforts.

## Equity



*Equity Goal: Prioritizing the advancement of equity outcomes into policies and programs*

### **Equity Guardrails**

Berkeley's Existing Buildings Electrification Strategy (BEBES, 2021) developed a set of "Equity Guardrails" which serve as minimum requirements that must be met in order to equitably advance a policy, program or project. These guardrails were developed as a result of targeted outreach with disadvantaged communities to better understand and elevate their priorities and needs. The Planning & Development Department's Office of Energy and Sustainable Development (OESD) applies these guardrails to all of its work. They include:

- Maximize Access to Health, Safety & Mobility Benefits
- Maximize Access to Economic Benefits
- Maximize Ease of Participation
- Promote Housing Affordability & Anti-Displacement

### **Measuring Progress**

Cities often use quantitative metrics like GHG inventories to measure progress on climate action, but these inventories only tell part of the story. Ideally, both qualitative and quantitative indicators are co-created with the community to identify meaningful measures of success based on the community's priorities. By creating indicators that show meaningful and equity-focused outcomes, staff can adjust programs and policies to improve equitable outcomes over time, and increase the quality of life for members of the community – particularly those who have been historically disadvantaged and are most impacted by climate change. The City of Berkeley has been awarded a grant from the CA Office of Planning and Research's Adaptation Planning Grant Program, which includes funding to co-create climate and resilience metrics with community. This work is anticipated to be completed in 2026.

## Transportation



*Transportation Goal: Advancing opportunities for people to safely walk, bike, take public transit, and electrify mobility options*

### **Transportation Sector Emissions**

In 2021, Berkeley began to see a return in transportation emissions from the 2020 impacts of COVID-19, but these transportation sector emissions remain 9% below the

pre-pandemic year of 2019. Overall, total community transportation GHG emissions decreased 14% between 2021 and the baseline year of 2000. Emissions from on-road vehicles are calculated using total miles traveled provided by Google Environmental Insights Explorer<sup>2</sup>.

### **Electric Mobility Roadmap**

The Berkeley Electric Mobility Roadmap, adopted by Berkeley City Council in July 2020, identifies goals, strategies, and actions to create a fossil fuel-free transportation system. This supports the City's ongoing efforts to increase walking, biking, and public transportation, and helps to ensure equitable access to the benefits of clean transportation. The four goals of the Roadmap, along with implementation updates, are detailed below:

#### **1. Ensure Equity in Access to Electric Mobility:** Maximize electric mobility benefits in underserved communities

- **Pilot Climate Equity Fund:** On July 27, 2021, City Council approved a resolution establishing a Pilot Climate Equity Action Fund and allocated \$600,000 to provide climate change and resilience benefits to low-income residents. One of the three program areas<sup>3</sup> is the Berkeley E-Bike Equity Program (BEEP), a \$250,000 electric bike (e-bike) access program for income-qualified Berkeley households, and an e-bike youth education and workforce training program to service e-bikes and provide training for high-road job opportunities. The local non-profit Waterside Workshops, with assistance from GRID Alternatives, is implementing BEEP including education and workforce training on e-bike assembly and maintenance for its youth interns. In 2023, the BEEP program provided safety training and distributed 56 e-bikes to program recipients.

#### **2. Improve Alternatives to Driving:** Shift trips to walking, biking, and shared electric modes

- **Micromobility:** In September 2021, Berkeley City Council adopted a resolution to establish a shared electric micromobility permit program which allows operators (currently Veo and Link) to provide Berkeley residents and visitors with more sustainable commute options using electric scooters and e-bikes. To ensure equitable access to these devices, at least 50% of these devices must be deployed in designated equity priority areas, and operators are required to provide both low-income programs and more accessible devices, such as sit scooters. In May 2023, the City renewed permits for two shared mobility operators, with 400 stand-scooters and 400 seated-scooters approved to operate in Berkeley. In the period between July 2022 and June 2023 a total of 281,973

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<sup>2</sup> <https://insights.sustainability.google/>

<sup>3</sup> Additional information on the other program areas of the Pilot Climate Equity Fund is provided in the Buildings section of this report.

trips, representing 268,125 total miles, were taken on these shared electric scooters and bicycles.

### 3. **Achieve Zero Net Carbon:** Eliminate emissions from private vehicles

- **Electric Vehicle Charging:** The City continues to promote the use of electric vehicles (EVs) and facilitate the installation of EV charging stations by offering streamlined permitting, educating property owners about EV charging and grant opportunities, and providing EV charging on municipal property. Based on field verification, in October 2023 there are currently 129 publicly available EV charging ports in Berkeley (Level 2 and Direct Current Fast Chargers, or DCFC) in addition to at least 75 EV charging ports installed by businesses for their employees, or in multifamily apartment buildings for residents and visitors. The City is currently partnering with Ava to develop public DCFC Hubs at two locations in Berkeley. Local amendments to the 2022 California Green Building Standards Code, effective January 2023, require levels of EV charging in new buildings in Berkeley which exceed state requirements.

### 4. **Demonstrate City Leadership:** Lead by example and guide the electric mobility transition

- **Electrification of City Fleet:** Staff worked with Ava to conduct a municipal fleet electrification assessment including a plan for EV deployment and associated charging infrastructure through 2030, presented to Council in July 2020. The City is currently working to add EV charging for fleet vehicles at the Corporation Yard, and has continued to increase the number of EVs in the municipal fleet. In 2023, EV additions to the municipal fleet will include 14 electric sedans, three electric cross-over SUVs, and one electric pick-up truck.
- **Electric Mobility Position:** The City hired an Electric Mobility Coordinator in March 2023. This position convenes the City's Electric Mobility Implementation Working Group, manages and coordinates the development of City-owned EV charging infrastructure, tracks and develops programs utilizing emerging mobility options, obtains grant funding for the City's electric mobility programs, and catalyzes actions such as electric mobility equity pilot projects, new best practices for curbside vehicle charging, and shared electric mobility hubs.

**Measuring Progress in the Transportation Sector**

**% Sustainable Trips**



**31%**  
in 2021<sup>4</sup>

**Goal:** Increase of share of trips taken on sustainable modes of transportation to 50% by 2030 and 100% by 2040<sup>5</sup>

**% EV Adoption**



**9.2%**  
in 2022

**Goal:** Increase the share of light-duty EVs registered in Berkeley to 25% by 2025, 55% by 2030, and 100% by 2045

**# of Gas Cars Per Household**



**1.3**  
in 2022

**Goal:** Reduce the number of gas cars per household to 0 by 2045

**# of Public Level 2 Chargers**



**110**  
in October 2023<sup>6</sup>

**Goal:** Install at least 420 public Level 2 chargers by 2025<sup>7</sup>

**# of Public DC Fast Chargers**



**19**  
in October 2023<sup>8</sup>

**Goal:** Install at least 100 public direct current fast chargers (DCFC) by 2025<sup>7</sup>

<sup>4</sup> Percent of sustainable trips in 2021 only includes trips from walking, biking, and public transit as EV trip data is currently not available.

<sup>5</sup> The goal to increase sustainable trips to 100% by 2040 includes trips from walking, bicycling, public transit, and EVs.

<sup>6</sup> The number of chargers decreased from last year's reported value. There were few new installations and many chargers were switched from public to restricted use for fleets, employee and/or residents.

<sup>7</sup> Berkeley's estimates for number of chargers needed by 2025 are based on charging infrastructure projections provided by the California Energy Commission using Alameda County's ratio of needed EV chargers to projected EVs.

<sup>8</sup> Includes Tesla fast chargers



## Buildings



*Buildings Goal: Reducing energy use, promoting cleaner energy, and transitioning all buildings to clean electricity*

### **Building Sector Emissions**

Overall GHG emissions from Berkeley's building sector decreased by 7% from 2020 to 2021, and are 34% below 2000 levels. Total community-wide electricity usage decreased 14% between 2020 and 2021, and has decreased by 45% since 2000. Total community-wide natural gas usage increased by 1% from 2020 to 2021, but has decreased by 22% since 2000.

### **Impacts to Berkeley's Building sector emissions:**

- **Ava Bright Choice Electricity Emission Factor** – The emission factor for Ava's default electricity product, Bright Choice, increased significantly in 2020 compared to the 2019 value due to the changing procurement costs and loss of nuclear allocation in the electricity mix. In 2021 the Bright Choice emission factor decreased by 5% from 2020, but remains over three times higher than it was in 2019. The Bright Choice product accounts for 92% of Berkeley's 2021 community-wide electricity consumption. Ava is committed to providing 100% emissions-free Bright Choice by 2030. Additionally, in 2022 all Berkeley customers were automatically opted-up into Ava's Renewable 100, so a significant decrease in community-wide electricity emissions is expected for the 2022 inventory.
- **Direct Access Accounts** – The dataset used to calculate GHG emissions does not include Direct Access accounts, an option that allows eligible customers to purchase their electricity directly from third party providers known as Electric Service Providers. Due to an increase of Direct Access accounts which were therefore not included in the dataset, reported community-wide electricity usage showed a decrease in 2021.

### **Municipal Buildings Progress**

Municipal buildings are assessed for energy efficiency, electrification, and rate plan savings opportunities on an ongoing basis.

- Recently completed projects and major current efforts include:
  - **Building Lighting Upgrades to LED:** The Public Safety Building, which was a 2023 US Department of Energy Award-Winning Design, saves over 300,000 kilowatt-hours (kWh) annually. Other Fire Stations, Public garages, and Municipal building upgrades are in process.
  - **Building Envelope Improvements:** Mental Health Clinic, Ann Chandler Health Clinic, West Branch Library

- **Kitchen Electrification:** North & South Berkeley Senior Centers
  - **Heat Pump Water Heaters:** Main Library, North & South Library Branches, Corporation Yard Green Room & Ratcliff Building (Admin), Fire Stations 3 & 6, Marina Admin/Restroom, and non-profit sites (non-City buildings): Women's Daytime Drop-In Center, and Harrison House
  - **Solar Electric Generation:** Shorebird Park Nature Center, Berkeley Corp Yard, West Branch Library, South Branch Library, North Berkeley Senior Center
  - **Solar Thermal:** West Campus Swim Center, Shorebird Park Nature Center, West Branch Library
- **Municipal Solar + Storage:** The City, alongside several other cities in the Ava territory, is partnering with Ava to procure and implement solar + storage systems at critical municipal facilities to provide increased resilience and clean back-up power. Ava released a joint Request for Offers (RFO) for Power Purchase Agreement vendors in 2022 and re-released it in 2023. Ava hopes to select a vendor by early 2024, and start installation in 2024.
  - **Switching to Ava Community Energy (formerly East Bay Community Energy) Renewable 100:** In 2019, Berkeley City Council voted to switch municipal facilities to Ava's Renewable 100 (R100) electricity service.

### Voluntary Transition off Fossil Fuels

Berkeley homeowners have started voluntarily transitioning their gas, water, and HVAC systems to electric heat pumps. Heat pumps utilize clean electricity, are highly efficient compared to their gas counterparts, reduce building GHG emissions and provide a variety of other benefits including increased comfort and better indoor air quality. There are challenges to quantifying the number of heat pump installations in Berkeley, as the City's existing permit database doesn't provide ways to track specific technologies. The City's future replacement building permit system will incorporate the ability to readily track and report these electrification upgrades.

Several incentive programs<sup>9</sup> are available for heat pump water heaters (HPWH) and heat pump HVAC systems (HP HVAC), including TECH Clean California and BayREN. While upgrades through these programs don't account for the total number of heat pumps installed, they provide general indication of heat pump adoption trends in Berkeley.

- **TECH Clean California** is a statewide initiative, funded by California gas corporation ratepayers, to accelerate the adoption of clean space and water heating technology across California in order to help meet the state goal of being carbon-neutral by 2045. Since its launch in 2022 through October 2023:

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<sup>9</sup> For more information on rebates and incentives for electrification, please see The Switch Is On: <https://switchison.org/>

- 38 Berkeley homes installed HPWHs qualifying for TECH Clean California rebates totaling \$60,700
- 157 Berkeley homes installed HP HVACs qualifying for TECH Clean California rebates totaling \$442,000
- **BayREN** offers a variety of rebates for heat pumps.
  - Through BayREN's Home+ program, from 2019 to July 2023:
    - 93 Berkeley homes installed HPWHs qualifying for BayREN rebates totaling \$93,000
    - 28 Berkeley homes installed HP HVACs qualifying for BayREN rebates totaling \$28,000
  - BayREN's also offers a \$1,000 incentive per HPWH upgrade for contractors, and can be stacked with other rebates, such as the TECH Clean California rebates. Since the BayREN HPWH contractor rebate launch in 2020, local contractors received \$83,000 in rebates for 83 HPWH installations in Berkeley.

### Switching Residential and Commercial Accounts to Ava Community Energy Renewable 100

In 2019, Berkeley's electricity accounts began the transition to Ava's Renewable 100 (R100) electricity service. Residential customers transitioned in March 2022, and commercial customers in October 2022. One year after all buildings have completed the transition, over 96% of accounts (excluding CARE customers who remained on Bright Choice) are receiving R100 electricity service.

Berkeley Customers by Sector	Total Accounts	Renewable 100	Bright Choice
<b>Residential (excluding CARE)</b>	42,850	97%	3%
<b>Residential (CARE)</b>	5,813	N/A	100%
<b>Non-Residential</b>	5,065	96%	4%
<b>All Accounts</b>	53,728	86%	14%

### Building Emissions Saving Ordinance (BESO) Implementation

Berkeley's Building Emissions Saving Ordinance (BESO) requires building owners to complete and publicly report building-specific energy efficiency assessments and energy scores when a building changes ownership (also known as "time of sale"). The goal of BESO is to reduce both energy costs and GHG emissions in Berkeley's existing buildings. To date, BESO has achieved many successes, including:

- Provided data on the energy use and energy efficiency opportunities of Berkeley's existing building stock
- 3,646 energy assessments completed

- 2,959 Home Energy Scores<sup>10</sup> completed, with an average score of 4.5 out of 10
- Developed new communications to promote energy efficiency and electrification upgrades
- Since the beginning of 2022, 46 homes have applied to complete qualifying energy or electrification upgrades, in place of energy assessments to satisfy BESO requirements at time of listing for sale
- **Time of Sale Energy Upgrade Requirements**  
In December 2020, Berkeley City Council amended BESO to further align the program with the City's electrification and community resilience goals. The amendment directed staff to develop energy upgrade requirements for Council consideration. In early 2023, staff assembled a Technical Advisory Committee (TAC) of building decarbonization experts from local, state, and federal organizations, including PG&E, Ava, California Energy Commission, the Berkeley Lab, Building Decarbonization Coalition, contractors and architects, to advise on potential requirements at time of sale. Over the last year, staff worked with the TAC, Bridge Association of Realtors, the Berkeley Rent Board, and the Environment and Climate Commission to develop a policy proposal. Staff plans to bring an amendment to BESO to Council in early 2024, which will include energy upgrade requirements for small residential buildings.
- **Building Performance Standards**  
Building performance standards establish building-level requirements such as minimum GHG emissions standards or elimination of gas systems or equipment by a specified date. These standards are generally applied to larger buildings, including multi-family residential and commercial buildings, in order to have the highest impact on the largest energy users. The size and type of building covered could expand over time. Staff is working to develop requirements for building performance standards that lead to the elimination of gas in Berkeley's large buildings. These requirements would be administered through Berkeley's existing BESO program.

### **Pilot Climate Equity Fund**

On July 27, 2021, City Council approved a resolution establishing a Pilot Climate Equity Action Fund and allocated \$600,000 to provide building and transportation electrification and resilience benefits to low-to-moderate income residents. The City of Berkeley released an RFP in December 2021, and on April 26, 2022, the City Council approved

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<sup>10</sup> Developed by the US Department of Energy and its national laboratories, the Home Energy Score provides home owners, buyers, and renters directly comparable and credible information about a home's energy use. Each Home Energy Score is shown on a simple one-to-ten scale, where a ten represents the most efficient homes. More information can be found at: <https://www.energy.gov/eere/buildings/downloads/home-energy-score#:~:text=Developed%20by%20DOE%20and%20its,about%20a%20home's%20energy%20use.&text=Each%20Home%20Energy%20Score%20is,represents%20the%20most%20efficient%20homes.>

contracts with five vendors. Implementation of these programs is underway and will take place through 2024. The three program areas include:

- **Resilient Home Retrofits Pilot:** Provides direct building decarbonization improvements for low-to-moderate income residents' homes to enhance resilience, support occupant health and reduce GHG emissions.
- **Berkeley Equity E-Bike Program (BEEP):** An electric bike (e-bike) access program for income-qualified Berkeley households, and an e-bike youth education and workforce training program to service the e-bikes and provide training for high-road job opportunities.
- **Climate Equity Collaborative:** Elevates under-represented voices, while increasing access to information and equipment for climate resilience and electrification efforts.

### **Kala Art Institute Municipal Artist-In-Residence**

The Planning and Development Department is participating in Kala Art Institute's Print Public Municipal Artist in Residence Program, an arts-integrated approach to urban planning and community activation. The goal of the program is for artists to work with city departments as cultural strategists to help approach challenges in new ways, and lift up voices that are less often heard. The Pilot Climate Equity Fund is participating in this program, and staff is partnering with the artist Cheryl Derricotte through Fall 2024.

### **Just Transition Pilot Program**

On June 14, 2022, City Council approved a resolution to develop a Just Transition Pilot Program, with a budget of \$1,500,000. This program aims to aggregate multiple direct install projects of electrification measures in existing affordable housing buildings and/or for low-to-moderate income households (at or below 120% of the Area Median Income, or AMI). Electrification measures include replacing gas water heating, HVAC, electrical upgrades and cooking equipment with efficient electric systems. The program requires that upgrades be completed by pre-qualified contractors who meet minimum labor standards, to ensure that residential electrification construction work also provides equitable benefits to workers. The objective of labor standards is to advance high-road, family-sustaining jobs that pay living wages, with comprehensive benefits and opportunities for career advancement for a diverse workforce.

Staff conducted extensive research to inform program design through expert interviews and active participation in the Bay Area High Road Training Partnership (H RTP)<sup>11</sup>. Staff also received valuable input from the Berkeley Environment and Climate Commission (ECC) on September 28, 2022, the City Council Facilities, Infrastructure, Transportation, Environment & Sustainability (FITES) Policy Committee on November 3, 2022, and the Commission on Labor on November 30, 2022. The City released an RFP in January 2023 to develop and implement the Just Transition Pilot Program. On June 6, 2023, City Council approved a resolution authorizing the City Manager to award a contract with

<sup>11</sup> <https://cwdb.ca.gov/initiatives/high-road-training-partnerships/>





Rebuilding Together East Bay North (RTEBN) as the contractor, who is teaming with the Construction Trades Workforce Initiative (CTWI). The City is in the contracting process and anticipates starting the project in December 2023, with installations taking place over two years. Staff will report back to Council next year with a program status as part of the Climate Action Plan and Resilience Update.

### **Indoor Appliances Implementation Working Group**

Berkeley city staff were invited (along with only two other municipalities) to participate in the Bay Area Air Quality Management District (BAAQMD) Indoor Appliances Working Group (IWG). The BAAQMD adopted amendments to Rule 9-4 and Rule 9-6 in March 2023 which establish zero-nitrogen oxide (NOx) emissions standards for gas furnaces and water heaters.<sup>12</sup> These rules phase in requirements, beginning in 2027, that will ultimately only allow heat pumps (zero NOx appliances) to be sold and installed in the Bay Area for new water heaters and furnaces. The IWG is assisting the BAAQMD in identifying and addressing implementation issues including technical and workforce readiness of the market and equitable transition to compliant appliances.

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<sup>12</sup> <https://www.baaqmd.gov/rules-and-compliance/rule-development/building-appliances>

Measuring Progress in the Building Sector		
<p><b>Community-wide Building Energy Usage from Gas Combustion</b></p> 	<p><b>73%</b> in 2021<sup>13</sup></p>	<p><b>Goal:</b> Decrease percentage of building energy from fossil fuel consumption, in the form of gas combustion, to 0 by 2045 while switching to clean electricity</p>
<p><b>BayREN Home+: # of Measures Completed</b></p> 	<p><b>1,139</b> from 2019-2022</p>	<p><b>Goal:</b> Increase BayREN Home+ participation</p>
<p><b>BayREN Multifamily: # of Units Participated</b></p> 	<p><b>1,052</b> from 2014-2022</p>	<p><b>Goal:</b> Increase BayREN Multifamily participation and upgrade more units to decrease energy use, emissions, and increase comfort</p>
<p><b>Total GHG emissions Saved through BayREN Upgrades</b></p> 	<p><b>367</b> <sub>mtCO<sub>2</sub>e</sub> from 2014-2022</p>	<p><b>Goal:</b> Increase total GHG emissions saved through participation in BayREN Home+ and BayREN Multifamily</p>

**Waste**



*Waste Goal: Leading the way towards zero waste in policy, planning and practice*

**Landfill Solid Waste Emissions**

Total community-wide landfill solid waste and overall emissions from the waste sector decreased by 3% in 2021 compared to 2020, placing current waste sector emissions 49% below the 2000 baseline.

<sup>13</sup> Due to the increase in Direct Access energy, our reported Citywide electricity use decreased. More information is provided above.



**Impacts to Berkeley's emissions:**

- **SB 1383**

In 2016, SB 1383 was signed into law. This State legislation is designed to reduce short-lived climate pollutants and requires 75% organic waste reduction by 2025 and a 20% increase in recovery of edible food that is currently disposed by 2025. California local jurisdictions have significant, new requirements to implement additional waste reduction programs and enhanced reporting and enforcement protocols to comply with the state legislation. SB 1383 implementation started January 1, 2022.

## Community Outreach & Engagement



*Community Engagement Goal: Achieving equitable climate action together*

Since 2012, the Berkeley Climate Action Coalition (BCAC), co-convened by the Ecology Center and the City, has been a vehicle for climate engagement. BCAC continues to engage Berkeley and East Bay residents on climate action issues through in-person and online events.

**Community Webinars**

The City collaborated with governmental and community organizations, and municipalities in both Alameda and Contra Costa counties to host webinars on a variety of topics such as building electrification, climate justice, residential energy efficiency, electric cars and bikes, and solar and storage.

**East Bay Green Home Tours**

Since 2021, the City has hosted virtual *East Bay Green Home Tours*<sup>14</sup> showcasing various efforts of local residents to save water and energy, increase resilience to drought and heat, electrify their appliances, and reduce the carbon footprint of their homes. Hundreds of people have attended the event each year, and the videos that are available online afterwards continue to receive thousands of views.

**Ride Electric**

The City hosted its *6<sup>th</sup> Annual Ride Electric* in conjunction with the City Harvest Festival on October 21, 2023. This event offers electric bike and scooter test rides through the City's shared electric mobility providers and local bicycle retailers, and this year hosted an exciting new municipal fleet electric vehicle showcase. As in years past, the City offered multiple resources to income-qualified residents to help electrify their ride. Additionally, the City invited multiple community partners such as Ava Community

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<sup>14</sup> <https://www.eastbaygreenhome.com/>



Energy, the Ecology Center, and Citizen's Climate Lobby to host interactive information tables on home electrification and recycling.

## **Climate Adaptation & Community Resilience**



*Adaptation and Resilience Goal: Strengthening and preparing the community for shocks and stresses, including adapting to the impacts of climate change*

The City's resilience efforts, as outlined in the 2016 Resilience Strategy, include the following goals:

1. Build a connected and prepared community
2. Accelerate access to reliable and clean energy
3. Adapt to the changing climate
4. Advance racial equity
5. Excel at working together within City government to better serve the community
6. Build regional resilience

Many City departments are coordinating and leading efforts to enhance resilience and help Berkeley adapt to a changing climate, including Planning, Public Works, Parks Recreation and Waterfront, Health, Housing and Community Services, and Fire. A summary of programs is provided below:

### **Adaptation Planning Grant Program**

The City of Berkeley in partnership with the Ecology Center and the Berkeley Climate Equity Collaborative, is being awarded a nearly \$500,000 grant from the Governor's Office of Planning and Research (OPR) Adaptation Planning Grant Program (APGP). The project includes co-creating with community an update to Berkeley's General Plan Safety Element, development of a new General Plan Environmental Justice Element, and creation of an Equitable Climate and Resilience Monitoring and Evaluation Strategy and Dashboard. As part of this work, the team will conduct additional technical analyses which will guide strategies, goals and policies of the Safety and Environmental Justice Elements, as well as future General Plan Element updates. The intent of the project is to achieve equitable outcomes that are specific and measurable through co-creating the climate adaptation and resilience policies and programs with vulnerable communities, as well as meaningful metrics for monitoring and evaluation.

**Local Hazard Mitigation Plan (LHMP)**

The LHMP is the main document that houses the City's climate adaptation work, and is currently being updated. A draft plan is anticipated to be released in late 2023 for public review and the final plan is anticipated to be completed and adopted in 2024.

**Extreme Heat Planning**

The City of Berkeley is developing extreme heat protocols for City operations. This work evaluates city infrastructure and community needs, and is integrating best practices from other jurisdictions. The City is also participating in a regional group coordinated with UC Berkeley, the Berkeley Lab, and several Bay Area jurisdictions, to share and plan around extreme heat.

**Wildfire Smoke**

The Bay Area has experienced multiple days and periods of unhealthy air quality due to wildfire smoke in recent years. These events can coincide with heat waves, high fire risks, and/or Public Safety Power Shutoffs. To better address the threat of wildfire smoke, in 2019 the City of Berkeley participated in a grant led by Alameda County to create a communications protocol for responding to wildfire smoke and other air quality conditions. In addition, in 2023 the Office of Emergency Services secured 28 air cleaners from a Bay Area Air Quality Management District (BAAQMD) grant. These air cleaners were distributed to public facing sites including libraries and community centers for use during poor air quality events. The City is also working to advance emergency and resilience planning for extreme heat and high air quality index (AQI) events, including coordination with cities around North America, and local collaboration outreach with community partners serving disadvantaged communities.

**Sea Level Rise**

In 2019, the City initiated the Waterfront Specific Plan project to develop a long-term vision for achieving a financially self-sustainable publicly-owned Waterfront. The team conducted an extensive community outreach process and a draft Sea Level Rise Study for the Berkeley Waterfront. Preliminary findings indicate that three locations at the Berkeley Waterfront may experience periodic flooding by 2050 during a 100-year storm and King tide:

1. The shoreline at the north segment of Marina Blvd between the Virginia Street Extension and the entrance to Cesar Chavez Park
  - Staff is in partnership with East Bay Regional Park District (EBRPD) as part of their North Basin Strip planning and design project (funding provided to EBRPD by Measure AA - San Francisco Bay Restoration Authority) to conduct a feasibility study with collaborative input from City.
2. The shoreline to the south of University Avenue between West Frontage Road and Marina Blvd

- In 2023 staff submitted a grant application to the US Department of Transportation for the Berkeley Waterfront University Ave Shoreline and Habitat Resiliency Project for consideration. The funder plans to notify selected awardees in early 2024.
3. Various spots in the northeast corner of the inner harbor of the Marina.

### **Groundwater Rise**

Shallow groundwater in coastal communities will rise as sea levels rise, increasing the risk of flooding communities from below. Through funding from the California Resilience Challenge grant, a project led by the San Francisco Estuary Institute Aquatic Science Center, in collaboration with Pathways Climate Institute, UC Berkeley, and Bay Area cities and counties, explored the links between sea level rise, precipitation, and the elevation of shallow groundwater in the Bay Area. The City of Berkeley was a joint proposer and participated in the Project Management Taskforce.

The final report<sup>15</sup> provides existing conditions groundwater mapping and future condition projections, suggestions on how to use this dataset for planning purposes, recommendations for additional modeling and assessments, and potential next steps. The City plans to take this study to the next step by evaluating the impact of shallow groundwater rise and sea level rise on toxic materials stored underground. This work is being funded through a grant from the CA OPR APGP grant (described above) and will take place from 2024-2026.

### **Tree Canopy**

The City of Berkeley currently has a vibrant urban forest made up of approximately 38,000 street, park and median trees. These trees are managed and maintained by the Urban Forestry Unit of the Parks, Recreation & Waterfront Department. However, while dense and vibrant in areas, this urban forest is not equitably distributed throughout the City. Current tree inventories and overall canopy coverage data illustrates fewer trees located in the West and South Berkeley neighborhoods, which also have a higher population of lower-income and historically disadvantaged communities. The City plans to plant 1,000 new trees in West and South Berkeley neighborhoods over the next two years. Funds have been secured to cover most costs through an Urban Greening Grant of \$726,000 and an Environmental Enhancement and Mitigation Grant of \$576,000. Both grants are sponsored by the California Natural Resources Agency. In addition, the City was awarded a federal Urban and Community Forestry grant from the Inflation Reduction Act for \$1,000,000 to hire staff and continue tree planting work over the next five years.

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<sup>15</sup> May, C. L.; Mohan, A.; Plane, E.; Ramirez-Lopez, D.; Mak, M.; Luchinsky, L.; Hale, T.; Hill, K. 2022. Shallow Groundwater Response to Sea-Level Rise: Alameda, Marin, San Francisco, and San Mateo Counties. Pathways Climate Institute and San Francisco Estuary Institute. See: <https://www.sfei.org/projects/shallow-groundwater-response-sea-level-rise>

This project aims to eliminate the past barriers to growing new street trees by first promoting tree planting opportunities, engaging with communities and gathering specific tree planting requests in areas with low tree counts. Next, funding will cover all costs of the tree growing process, which include site planning and species selection, creating new sidewalk growing spaces, purchasing and planting trees, and providing the three years of watering investment needed to establish these drought tolerant trees.

These new trees will help to provide shade, cooling, storm water benefits, and beautification in neighborhoods that have been historically underserved. Additionally, this project offers an opportunity to grow tree species which are resilient and climate change ready, and to utilize modern urban forestry methods to create sustainable sites and reduce future infrastructure conflicts.

### **Pollinator Gardens**

Bees and other insects are responsible for the pollination of much of the world's crops and flowering plants. The ecological service they provide is essential for a healthy environment. While numbers of many species have declined, several Berkeley Parks have been renovated to create space for native pollinator gardens and corridors. The pollinator garden partnership and collaboration began in 2020. Since the last report in 2021, two new sites have broken ground, one site is actively in construction, and there are also plans for another installation later in 2024:

- A new community garden at Sixty-Third St. Mini-Park
- A new pollinator garden at Charlie Dorr Mini Park
- A large new 5,000 square foot native garden on the west side of the roundabout at University Ave. and Marina Blvd.
- Ground broke for four renovated native planters at the Berkeley Marina Sportsman Center Bait Shop at 225 University Ave.
- Ground broke for a pollinator garden at Monterey Ave. and Posen Ave.
- Plans for both a pollinator garden and a Community Garden at the newly renovated areas of Grove Park

### **Bay Area Climate Adaptation Network (BayCAN)**

Berkeley is a founding member and participates in the Executive Committee of the Bay Area Climate Adaptation Network (BayCAN), a network of local government staff helping coordinate an effective and equitable response to the impacts of climate change. BayCAN works to share best practices, develop opportunities for collaboration and program implementation, and secure funding and resources for equitable climate adaptation.

## Climate Action at UC Berkeley and The Berkeley Lab

UC Berkeley and the Berkeley Lab are not included in Berkeley's GHG emissions inventory because their campuses are outside of the City's jurisdiction. However, both institutions track their own emissions reduction goals and are engaged community partners in addressing climate change. UC Berkeley and the Berkeley Lab have completed their 2022 GHG inventories and they provide additional information on their climate action progress in their 2022 Sustainability Reports<sup>16</sup>.

The Berkeley Lab has partnered directly with the City on several innovative sustainability projects including building data management tools, zero-net energy analysis of municipal buildings, and a Building Performance Standard (BPS) policy analysis for the development of energy upgrade requirements through BESO. The City of Berkeley also participates in the Berkeley Lab Community Advisory Group (CAG).

### BACKGROUND

In recognition of the climate crisis, the City added additional climate goals to bolster the Climate Action Plan goal of reducing greenhouse gas emissions below 2000 levels by the year 2045. Berkeley's goals include:

- **Fossil Fuel Free Berkeley:** In June 2018, the City Council referred a proposed resolution to the Energy Commission and Transportation Commission to further implement the Climate Action Plan and establish a goal of becoming a Fossil Fuel Free City.
- **Climate Emergency:** On June 12, 2018, the City Council adopted a Climate Emergency Declaration.
- **Net-Zero Carbon Emissions:** In 2018, Mayor Arreguín announced the City's intention to achieve zero net carbon emissions by 2045, in alignment with California state-wide goals.
- **Race to Zero:** In 2021, Berkeley City Council adopted a resolution for the Cities Race to Zero Campaign to establish a 2030 emission reduction target that reflects Berkeley's fair share of the 50% global reduction in CO<sub>2</sub>e, committing to reduce emissions 60.5% from 2018 levels by 2030.

### ENVIRONMENTAL SUSTAINABILITY AND CLIMATE IMPACTS

The City's Climate Action Plan, Resilience Strategy, Local Hazard Mitigation Plan, and Strategic Plan all contribute to advancing the community towards a clean and resilient energy future that successfully meets Berkeley's climate goals. The City is actively working to advance a just transition to becoming a fossil fuel-free City, through projects

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<sup>16</sup> UC Berkeley 2022 Sustainability Report: <https://sustainabilityreport.ucop.edu/2022/locations/uc-berkeley/> and the Berkeley Lab 2021 Sustainability Report: <https://sustainabilityreport.ucop.edu/2021/locations/lawrence-berkeley-national-lab/>

such as the \$1.5 million Just Transition Pilot Program and the High Road Training Partnership.

POSSIBLE FUTURE ACTION

This report provides the City Council with an update on GHG emission trends, an overview of associated current activities, and efforts underway to accelerate the rate of GHG emission reductions to reach Berkeley’s increasingly ambitious climate goals. The Climate Equity Fund and Just Transition Program are examples of valuable opportunities to pilot programs that can eventually scale to continue to achieve equitable GHG emissions reductions.

FISCAL IMPACTS OF POSSIBLE FUTURE ACTION

Mitigation of GHG emissions within Berkeley and adapting to the impacts of climate change are interrelated. Current investment to reduce community-wide emissions and enhance climate adaptation and resilience, such as the Climate Equity Fund Pilot Projects and the Just Transition Pilot Project, will help reduce the costs of addressing the impacts of climate change in the future. Staff are closely monitoring the applicability and availability of regional, State and Federal funding to support the transition away from fossil fuels and other opportunities to clean energy and climate resilience goals.

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