

# City of Davis Climate Action and Adaptation Plan

## **GHG Target Memo**

This memorandum (memo) first presents a definition of carbon neutrality to help measure City of Davis' (the City) success toward its 2040 target. It then presents considerations and options for establishing a 2030 interim GHG target in the Climate Action and Adaptation Plan (CAAP). The options are informed by the best available science, State target-setting guidance, and the City's local emissions context.

In general, establishing local greenhouse gas (GHG) emissions targets can:

- ▶ Demonstrate the City's commitment to global efforts on climate change,
- ▶ Illustrate the relationship between the City's reduction target and the State's own reduction goals,
- ▶ Provide a goal post against which to track progress of the City's GHG reduction actions over time, and
- ▶ Demonstrate a level of GHG emissions below which the City would have less than cumulatively considerable GHG impacts.<sup>1</sup>

## Introduction

In 2008, the City of Davis developed its first GHG inventory and adopted a 2050 carbon neutrality goal with interim GHG targets. The Davis 2010 Climate Action and Adaptation Plan (CAAP)<sup>2</sup> established a framework for climate action over a five-year period in order to meet the City's reduction goals. Since this plan was developed, many sustainability milestones have been reached, including significant City measures and climate actions implemented in the past two years. For example, in March of 2019 the City Council approved the "Resolution Declaring a Climate Emergency and Proposing Mobilization Efforts to Restore a Safe Climate" which accelerated the City's carbon neutrality goal from 2050 to 2040 while committing to significant action to implementing carbon reduction actions by 2030. The City's 2040 goal would accelerate California's 2018 Executive Order (EO) B-55-18 that called for statewide carbon neutrality by 2045, and is aligned with the United Nations International Panel on Climate Change (IPCC) 2018 report that presents multiple pathways to keep global warming levels below a 1.5°C threshold.

The purpose of the CAAP update is to demonstrate the City's commitment to climate action by identifying strategies that will reduce climate risk and achieve the 2040 carbon neutrality goal. As a first step, the City completed a 2016 communitywide GHG inventory to identify its base year emissions footprint. The City will then develop emissions forecasts that reflects implementation of applicable federal, State, and local actions as well as anticipated growth in the City's population, employment, housing, and other factors. Following analysis of the community's emission sources and existing climate actions, the City will establish an interim GHG reduction target (as discussed in this memo) and identify local actions that could achieve this target and set a path toward long-term carbon neutrality. These actions will build upon the 2010 CAAP, other local climate actions, relevant actions from similar cities, and input from residents and stakeholders, ensuring that the CAAP uniquely reflects the priorities of the Davis community while considering the broader climate action context.

## Community-scale Carbon Neutrality

To help frame the intention of addressing climate change, in recent years terms such as carbon neutrality, net zero emissions and climate neutrality have emerged in frequent use from communities around the world. While use of these terms have slightly varying meanings, their use is largely a response to the Paris Agreement, adopted in 2015, which sets an international goal "to achieve a balance between anthropogenic emissions by sources and

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<sup>1</sup> *The City's target, along with reduction strategies necessary to achieve this target will facilitate tiering and streamlining for proposed projects under the provisions of CEQA Guidelines Section 15183.5.*

<sup>2</sup> *The City of Davis. Davis Climate Action and Adaptation Plan. 2010. Available: [http://www.cooldavis.org/wp-content/uploads/2010\\_Davis\\_Climate\\_Action\\_Adaptation\\_Plan.pdf](http://www.cooldavis.org/wp-content/uploads/2010_Davis_Climate_Action_Adaptation_Plan.pdf)*

removals by sinks of greenhouse gases.”<sup>3</sup> As a long-time leader in addressing climate change, California took further steps toward supporting this global need in September 2018 through Executive Order B-55-18, setting a goal to, “achieve carbon neutrality as soon as possible, and no later than 2045, and to achieve and maintain net negative emissions thereafter.”<sup>4</sup>

The technical needs to achieve such targets were clarified in October 2018 with the publication of the IPCC Special Report outlining potential pathways of global GHG emissions reductions that will need to occur in order to limit global warming to 1.5°C and achieve the carbon balance aspirations set in the Paris Agreement.<sup>5</sup> Bringing this international perspective locally, Energy and Environmental Economics, Inc. released a report in October 2020 titled *Achieving Carbon Neutrality in California PATHWAYS Scenarios Developed for the California Air Resources Board (PATHWAYS Scenarios report)*, which outlines the technical pathways for the state to achieve its specified carbon neutrality targets.<sup>6</sup> In support of the larger global need for action as well as the state of California framing within a more localized context, communities like Davis are stepping up their efforts to contribute.

The remainder of this section presents a definition of carbon neutrality, summarizes GHG emission sources that are currently technically infeasible to eliminate, and reviews the City of Davis context and local options available to address remaining emissions.

## Defining Carbon Neutrality

In describing community GHG emissions, the term “carbon neutrality” is often used interchangeably with “zero carbon emissions”, and “net zero carbon emissions”. It is important to clarify and define each of these terms.

**Zero Carbon Emissions:** In its strictest sense, this term refers to a scenario under which a city completely eliminates all sources of direct GHG emissions associated with its activities. While theoretically possible, this type of target is very challenging to achieve as carbon emissions are deeply embedded in nearly all aspects of modern life. Even if a community were to power its built environment and transportation sectors with 100% renewable energy, some GHG emissions from wastewater treatment, solid waste management, refrigeration, or fire suppression are not currently feasible to eliminate. It is worth noting that based on our review of best practices, no city has yet endeavored to establish a goal to achieve zero carbon emissions in the strictest sense of the definition.

**Net Zero Carbon Emissions:** This term means that the *net* GHG emissions associated with a city are zero. Under this scenario, some residual emissions may be produced by a community each year, but they can be fully balanced by investing in activities such as carbon capture and removal or the purchase of verified carbon credits. The City of Davis has set a 2040 carbon neutrality goal, which is defined as net zero carbon emissions.

## Technically Challenging Carbon Reductions and Residual GHG Emissions

Most communities are not inherently carbon neutral, as our economy, energy resources, and the products we consume rely on fossil fuels and other carbon-intensive resources that emit GHGs. For this reason, communities need to evaluate their current GHG emissions and identify ways to reduce GHG emissions unique to the specific community. Methods to reduce GHG emissions include actions such as efficiency standards, shifts to renewable energy, and alternative sourcing of carbon-intensive materials in the supply chains. With the current means available to reduce GHGs and transition to a low-carbon economy, there are several sources that remain challenging or are currently infeasible to eliminate. Below is a brief summary of these sources:

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<sup>3</sup> [https://unfccc.int/files/essential\\_background/convention/application/pdf/english\\_pari\\_agreement.pdf](https://unfccc.int/files/essential_background/convention/application/pdf/english_pari_agreement.pdf)

<sup>4</sup> <https://www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf>

<sup>5</sup> <https://www.ipcc.ch/sr15/>

<sup>66</sup> [https://ww2.arb.ca.gov/sites/default/files/2020-10/e3\\_cn\\_final\\_report\\_oct2020\\_0.pdf](https://ww2.arb.ca.gov/sites/default/files/2020-10/e3_cn_final_report_oct2020_0.pdf)

- ▶ Niche equipment or operations (e.g., high-global warming potential gas uses and large industry or transportation engines)
- ▶ Individually-owned vehicles and equipment for which funding or access barriers exist as a result of inequities and environmental justice issues
- ▶ GHG emissions from the supply-chain or outside the community, but resulting from community actions

Communities with carbon neutrality initiatives generally align stated actions toward carbon neutrality around the technical challenges and technologies represented in the first bullet above. This is also one of the most appropriate approaches to meet standardized inventory and progress tracking. Communities are also uniquely situated to take on the more challenging tasks of jointly addressing environmental justice issues along with climate change. For example, the Synthesis Report on *Carbon Neutrality and California's Transportation Fossil Fuel Supply* developed by emLab UC Santa Barbara focuses on the technical challenges of carbon neutrality within the transportation sector, while also acknowledging the importance of environmental justice.<sup>7</sup> It is important for communities to jointly address environmental justice and carbon neutrality through actions that ensure funding is not a barrier.

Supply-chain and consumption-based emissions remain among the most challenging to reduce, which has resulted in an emerging interest in community consumption-based emissions inventories to better understand the holistic perspective of GHG emissions caused by a community's activities.<sup>8</sup> Communities are uniquely positioned to address local consumption habits and guide the region's culture toward support of global carbon neutrality in a more holistic sense, which could include carbon reduction actions that are not traditionally tracked in a climate action plan. It is unlikely that such consumption-based approaches would be recommended for inclusion in a community carbon neutrality claim due to the challenges of tracking; however, it is mentioned here because of its importance to global carbon neutrality.

Information about emissions reduction pathways for niche equipment or operational sources are included in the previously cited PATHWAYS Scenarios report and also in *Getting to Neutral Options for Negative Carbon Emissions in California* developed by Livermore Laboratory Foundation and the ClimateWorks Foundation.<sup>9</sup> Each study provides context to understand the technical challenges to achieving carbon neutrality. The PATHWAYS Scenarios report indicates that at least 80% GHG reductions from 1990 levels can be achieved by 2045. However, this leaves approximately 20% of emissions remaining, which would then require removals or sinks to achieve carbon neutrality. The Livermore Laboratory Foundation and the ClimateWorks Foundation study focuses on these removal and sink opportunities.

## City of Davis Context

During the CAAP update process, the City will consider all feasible GHG emission reduction options. The challenge in defining a path toward neutrality will be in selecting the local actions to eliminate the city's remaining emission sources as described above. The City can address these remaining emissions through the following:

- ▶ Ensure environmental justice issues are met such as removal of funding barriers.
- ▶ Implement direct carbon removal or capture projects within the community
- ▶ Partner and collaborate with carbon removal/carbon capture projects outside of the community
  - Ensure appropriate agreements are made with partners to claim City's share of GHG removal; one method to achieve this would be through carefully vetted carbon credits, such as offsets

Carbon removal is the process of removing carbon dioxide or other GHGs from the atmosphere. This can be done through natural processes such as forest restoration and soil management or industrial mechanisms such as direct

<sup>7</sup> [https://emlab.msi.ucsb.edu/sites/emlab.msi.ucsb.edu/files/Syn\\_Rpt\\_CA\\_CN\\_Study2\\_.pdf](https://emlab.msi.ucsb.edu/sites/emlab.msi.ucsb.edu/files/Syn_Rpt_CA_CN_Study2_.pdf)

<sup>8</sup> <https://www.c40.org/researches/consumption-based-emissions>

<sup>9</sup> [https://www-gs.llnl.gov/content/assets/docs/energy/Getting\\_to\\_Neutral.pdf](https://www-gs.llnl.gov/content/assets/docs/energy/Getting_to_Neutral.pdf)

air capture (from the atmosphere) and point-source capture (from the emissions source before it reaches the atmosphere). The captured carbon can then encourage new industries that use carbon as an input or building material or it can be geologically stored.<sup>10</sup>

According to the City's 2010 CAAP, "Davis straddles and is surrounded by some of the finest farmland on the planet." Given this context, the City of Davis is uniquely positioned to locally address carbon removal within its agricultural community through soils management and other land-use carbon removal methods. Further, in 2020 the Yolo County Board of Supervisors voted to enact a plan to transition the county to a carbon-negative footprint by 2030, so there may be opportunities to collaborate regionally on a carbon removal program that helps multiple jurisdictions achieve their long-term GHG targets.

Implementing the latest in agricultural carbon removal options could provide a pathway for Davis to achieve carbon neutrality. The previously cited Livermore Laboratory Foundation and the ClimateWorks Foundation study contains some of the latest information regarding agriculture related carbon removal, and the California Air Resources Board maintains related materials as part of its Research Division.<sup>11</sup> Beyond carbon removal from agriculture, the City can follow the progress of industrial carbon removal processes and promote local implementation where politically and economically feasible. Industrial carbon removal is still in its early phases of development, and there are currently few examples of commercial-scale deployment to serve as roadmaps for Davis or other local communities. However, the technology is rapidly developing and the CAAP's long time frame suggests a potential role for this option in the future.

Carbon offsets are a useful means to implement GHG reduction projects and provide efficiency of markets when traded in the context of a regulated carbon market. However, offsets can pose certain challenges when used in the context of demonstrating achievement of a local GHG reduction target. Ecosystem Marketplace, an initiative of the non-profit organization Forest Trends, maintains annual reports on the state of voluntary carbon markets (i.e., carbon offsets), and each year indicates that less than half of globally produced carbon offsets are associated with carbon removal, sinks, or sequestration.<sup>12</sup> The remaining carbon offsets available for purchase in the voluntary carbon market are produced from a number of GHG reduction actions that address renewable energy, waste, and transportation. Given this context, the option of purchasing offset credits to demonstrate community carbon neutrality is only advised if the offsets are generated within a system (from a geographic location and regulatory structure perspective) that is aligned with the carbon neutrality objectives of California and the global Paris Agreement. Any offset credit generated and available for purchase that is *not* aligned with the objectives of each of these is also unlikely to satisfy the City of Davis' goals.

## Demonstrating Carbon Neutrality Achievement in the CAAP

For purposes of the City's CAAP, we recommend the following definition for carbon neutrality:

*Carbon neutrality is a zero balance in the city's emissions, demonstrated through ambitious local CAAP actions that reduce GHG emissions to the extent feasible and combined with implementation of local/regional carbon removal opportunities to remove any remaining emissions estimated to occur in the 2040 target year. These carbon removal opportunities can include agricultural practices, urban forest and open space sequestration, and other carbon removal methods as available and practical. As necessary, the City will monitor carbon markets and industrial carbon removal as secondary options for remaining emissions, including state-wide and out-of-state options.*

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<sup>10</sup> <https://www.wri.org/our-work/project/carbon-removal>

<sup>11</sup> <https://ww2.arb.ca.gov/research/research-agricultural-emissions-mitigation>

<sup>12</sup> <https://www.ecosystemmarketplace.com/carbon-markets/>

# Interim Target Setting

GHG targets serve as aspirational metrics to help focus local actions toward emissions reductions. Establishing clear and attainable targets can also motivate community members and City staff, help guide long-term strategies, and increase transparency and accountability regarding the CAAP's objectives. In order to develop a pathway toward the 2040 carbon neutrality target, the CAAP will include an interim GHG target aligned with the State's Senate Bill (SB) 32 GHG target year for 2030. This memo outlines potential 2030 target options.

There are several questions to consider when defining local GHG targets.

► **What type of targets can be used?**

Targets can be established based on mass emissions reductions (i.e., a set quantity of GHGs) or on emissions intensity (e.g., an amount of emissions per person) in the community.

► **What guidance is available to direct local governments in setting GHG targets?**

California has established several statewide GHG targets through legislative action that can help to inform local GHG target selection. State agencies, including the California Air Resources Board (CARB)<sup>13</sup> and the Governor's Office of Planning and Research (OPR)<sup>14</sup>, have also issued guidance to local governments on this topic. The state's CEQA Guidelines<sup>15</sup> also provide guidance on target selection for cities that would use their GHG reduction strategy to streamline environmental review for future development projects.

► **What is the City's emissions profile?**

A communitywide GHG reduction target should consider the sources of emissions and a city's ability to influence those sources.

► **What timeframe should the targets address?**

Establishing near-term targets that set a path toward more aggressive, long-term goals can be a successful approach in climate action planning. The specific target years can be chosen based on California's GHG targets, local planning priorities (such as the City's General Plan), or other considerations.

► **What kind of targets are other local governments in the area using?**

Davis is not acting alone in its efforts to reduce GHG emissions, and the targets of other local governments can also help to inform the City's own target selection process. The Other Local Government Targets section in this memo presents a sample of other local governments' GHG targets for comparison.

## Target Types

GHG targets can be expressed as either *mass emissions* targets or *emissions intensity* targets.

### Mass Emissions Targets

Mass emissions targets establish an absolute emissions level to be achieved by a target year, such as 100,000 metric tons of carbon dioxide equivalent per year (MT CO<sub>2</sub>e/yr) by 2020. Typically, mass emissions targets are

<sup>13</sup> California Air Resources Board. *California's 2017 Climate Change Scoping Plan*. 2017. Available: [https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping\\_plan\\_2017.pdf](https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf).

<sup>14</sup> The Governor's Office of Planning and Research. *State of California General Plan Guidelines, Chapter 8*. 2017. Available: [https://opr.ca.gov/docs/OPR\\_COMPLETE\\_7.31.17.pdf](https://opr.ca.gov/docs/OPR_COMPLETE_7.31.17.pdf)

<sup>15</sup> California Code of Regulations. § 15183.5. *Tiering and Streamlining the Analysis of Greenhouse Gas Emissions*. 2010. Available: [https://govt.westlaw.com/calregs/Document/I872A68805F7511DFBF66AC2936A1B85A?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)&bhcp=1](https://govt.westlaw.com/calregs/Document/I872A68805F7511DFBF66AC2936A1B85A?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)&bhcp=1)

expressed as a percent below the emissions level of some base year, such as 80% below 1990 emissions by 2050. Mass emissions targets are often used in the context of carbon neutrality.

### **Intensity–Based Emissions Targets**

Emissions intensity thresholds set a target level of emissions per population or per service population (i.e., local residents plus local jobs), such as 2.25 MT CO<sub>2</sub>e per service population per year (MT CO<sub>2</sub>e/SP/yr) by 2035. Intensity thresholds demonstrate a community’s ability to grow population and employment, while emissions shrink on a per-unit basis; in effect, a community could be growing more efficiently from an emissions standpoint. In this case, total emissions within a community may increase while still achieving an intensity target, if service population is growing faster than emissions.

Mass emissions and intensity-based targets are both useful to consider when evaluating appropriate emissions reduction targets, and the CARB 2017 Scoping Plan and OPR suggest that local governments consider both types in their Climate Action and Adaptation Plans.

### **Mass or Intensity-based Activity-Specific Targets**

While the types of targets described above focus on GHG emissions as a metric for measurement of progress, leading cities are also adopting goals that focus specifically on the activities causing GHG emissions, such as energy consumption in the building and transportation sectors or solid waste generation. These activity-specific targets can be helpful in communicating the City’s GHG goals more clearly and tracking progress within individual activities or sectors. However, they should not be used as a replacement for an overarching communitywide GHG target that covers all sectors and emissions activities because it can be difficult to understand how a specific activity target relates to total communitywide emissions. This can be especially problematic when using a CAAP to support CEQA streamlining for future projects where it is difficult to demonstrate how achievement of an activity target will result in a less than cumulatively considerable impact to GHG emissions.

**Mass Targets Related to Net-Zero Fossil Fuel Consumption or 100% Renewable Energy Use:** This type of target focuses on the activity that generates the majority of overall GHG emissions at the community level – fossil fuel combustion for energy generation used in buildings, vehicles, and equipment. Some cities use this target because they believe it is easier to understand than a GHG reduction target and is therefore more inspirational than a GHG reduction target. Some cities have applied this target strictly to electricity generation or related to a specific sector (like transportation), while others intend it to be used for all fuel sources.

**Intensity-based Activity Targets or Budgets:** Using the concept of intensity-based targets, many cities have applied these targets to key consumption activities in daily urban life to create a “budget”, such as reducing per-capita electricity consumption or driving by a certain percent by a future year. These forms of targets can make it easier to communicate the role of individual community members in reducing GHG emissions and achieving targets.

## **Guidance on Local Government Target Setting**

Guidance on local government target setting in California is primarily based on three sources: the State’s own GHG targets, CARB’s 2017 Climate Change Scoping Plan (Scoping Plan), and OPR’s General Plan Guidelines. Together, these sources help to frame the context for local GHG targets. For climate action plans that are designed to provide CEQA streamlining for future projects (like in Davis), precedent case law is another source of guidance for reduction targets, although this guidance is primarily based on the State’s legislative GHG reduction targets.

### **State GHG Targets**

California’s statewide GHG targets are defined through adopted legislation (2020 and 2030 target years) and Executive Orders (2045 and 2050 target year), as shown in Table 1.

Table 1 State of California Greenhouse Gas Targets		
Target Year	Target	Corresponding Legislation
2020	Return to 1990 GHG levels by 2020	Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006
2030	40% below 1990 levels by 2030	Senate Bill (SB) 32, the Global Warming Solutions Act of 2006
2045	Carbon neutrality by 2045	Executive Order (EO) B-55-18 of 2018
2050	80% below 1990 levels by 2050 <sup>16</sup>	EO S-3-05 of 2005

Some cities have simply adopted the State's exact targets, and others have calculated variations of them to more accurately reflect local demographic and economic conditions. There are four primary considerations when using the State's targets as the basis for local targets:

1. How can 1990 emissions levels be approximated locally?
2. What is the local GHG inventory base year?
3. What emission sources will be analyzed locally compared to the statewide inventory?
4. What degree of influence does the City have over different emissions sources?

The following sections provide context oriented around these four questions related to the direct use of the State's reduction targets.

### ***Approximate 1990 Emissions Levels***

The State's GHG targets have been established as mass emissions targets and are often referenced in local government target setting. However, the State's specific targets are each benchmarked to a 1990 GHG inventory, and, for most local governments, it is technically challenging to back-cast an inventory for that year. Guidance in CARB's 2008 Climate Change Scoping Plan had identified local governments as "essential partners" in achieving the State's GHG goals and encouraged adoption of local GHG targets "that parallel the State's commitment to reduce greenhouse gas emissions by approximately 15% from current [2005-2008] levels by 2020." Many local governments had followed this guidance for their 2020 CAP targets as a way to approximate a return to 1990 levels (i.e., the State's GHG target for 2020). This helps to explain why many original climate action plans in California had defined a 2020 target as 15% below baseline levels.

### ***Consider the Local Baseline Year***

It is worth noting that the original guidance suggesting a 15% reduction below "current" [2005-2008] GHG levels would approximate a return to 1990 levels was based on an earlier version of the State's emissions inventory. Following release of that guidance, the 2008 economic recession occurred, resulting in slower emissions growth statewide than previously anticipated. Further, as the 15% reduction target value was calculated relative to a 2005-2008 baseline, cities with different baseline years would have slightly different 2020 target values. CARB also subsequently revised the statewide 1990 inventory, which altered some of the underlying calculations associated with the 1990 target value. Based on the State's annual GHG inventories, California returned to 1990 levels (431 million MT CO<sub>2</sub>e) sometime between 2015 and 2016, after the economy had recovered from the 2008 recession.

<sup>16</sup> *The State's 2050 target was based on leading research at the time published by the IPCC regarding the emissions reductions required of developed countries to stabilize atmospheric carbon dioxide levels at approximately 450 parts per million (ppm) setting an upper limit to global temperature increase to 2° Celsius or less to avoid catastrophic impacts of global climate change. See United Nations International Panel on Climate Change, Fourth Assessment Report: Working Group III, Mitigation of Climate Change, 2007. Available: [https://www.ipcc.ch/publications\\_and\\_data/ar4/wg3/en/ch13-ens13-3-3-3.html](https://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch13-ens13-3-3-3.html)*

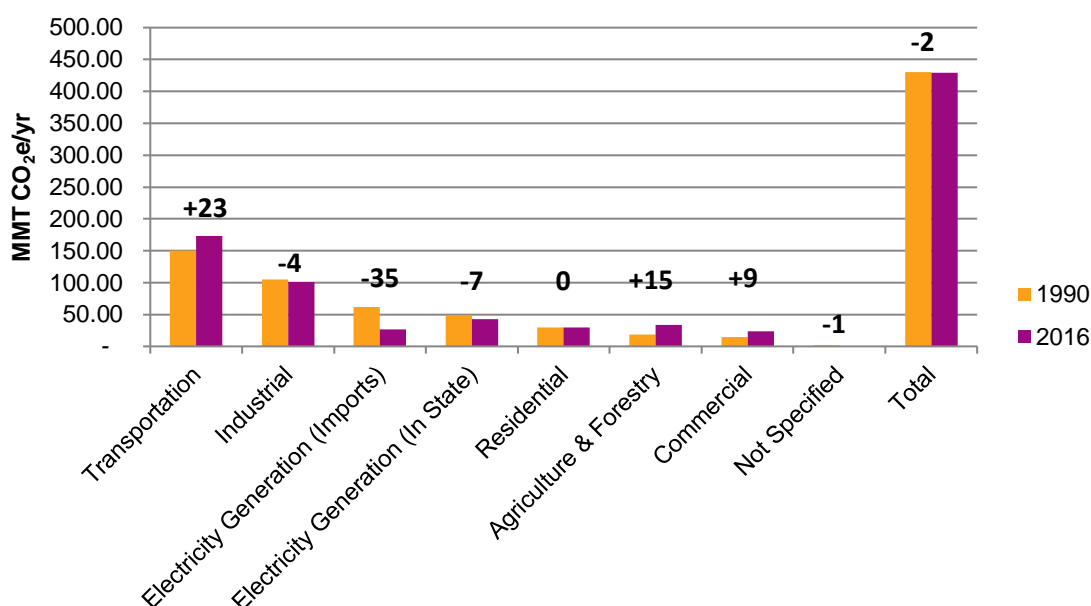


This value reflects the substantial success of emissions-reduction programs implemented across California since the adoption of AB 32. It also highlights the need to thoughtfully consider the selection of local GHG reduction targets with respect to now outdated guidance for local governments.

Because California returned to 1990 levels between 2015-2016, cities might now assume that a local 2016 GHG inventory base year can serve as a proxy for a 1990 inventory, reflecting the emissions results at the statewide level.

Figure 1 shows how the statewide emissions have changed from 1990 to 2016, the City’s base year. As shown, 2016 emissions represent a 2% reduction below 1990 levels, or approximately a return to 1990 levels. Emissions increases are primarily attributed to the transportation, agriculture and forestry, and commercial sectors while substantial emissions reductions occurred in the electricity sector during the same period.

**Figure 1 – Statewide Emissions Change by Sector<sup>17</sup>**



**Evaluate Local Emissions Sources**

As a final consideration for the State’s GHG targets, it is important to understand the sources of emissions included in the statewide inventory and how they differ from the sources typically represented at the community inventory level. Certain emissions sectors are not included or applicable locally but are included statewide based on the prevailing GHG inventory methodologies. For example, industrial process-related emissions occur within California and are included in the statewide inventory, but these same sources do not occur locally in all jurisdictions and so would not be represented in all communitywide inventories. In addition, some emission sources that may have a local presence are outside the control of local lead agencies. Therefore, the State’s GHG targets should also be customized for use locally in a way that considers the presence or absence of certain emissions sectors and relative

<sup>17</sup> Figure 1 shows the 1990 and 2016 emissions inventory results organized by economic sector categorization. 1990 inventory available: [https://ww3.arb.ca.gov/cc/inventory/archive/tables/ghg\\_inventory\\_sector\\_sum\\_90-04\\_ar4.pdf](https://ww3.arb.ca.gov/cc/inventory/archive/tables/ghg_inventory_sector_sum_90-04_ar4.pdf) ; 2016 inventory available: [https://ww3.arb.ca.gov/cc/inventory/data/tables/ghg\\_inventory\\_sector\\_sum\\_2000-17.pdf](https://ww3.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_sector_sum_2000-17.pdf). The Non-Specified sector emissions are not directly comparable from 1990 to 2016. The emissions in this sector, which include substitutes for ozone depleting substances and natural gas/LPG used for transport, were distributed to other sectors in 2016.

degree of municipal influence. This can be achieved by analyzing the sub-set of emissions sectors that will be included in the local GHG inventory.

Tailoring the reduction target to the specific local context also speaks to the direction from the California Supreme Court's 2015 decision in *Center for Biological Diversity v. California Department of Fish and Wildlife*,<sup>18</sup> commonly referenced as "Newhall Ranch." In Newhall Ranch, the Court indicated that the use of a State legislation-based GHG emissions significance threshold could be acceptable, so long as the administrative record supports how this threshold is appropriate for a specific project at a specific location.<sup>19</sup>

## CARB 2017 Climate Change Scoping Plan

In 2006, California Legislature passed AB 32 which created a comprehensive, multi-year program to reduce GHG emissions to 1990 levels by 2020. The original 2008 Scoping Plan was developed as a pathway to meet this target. Subsequently, SB 32 was adopted in 2016 and directed a statewide 2030 GHG target of 40% below 1990 levels by 2030. CARB finalized a revised Scoping Plan in 2017 to establish an achievement pathway for this new 2030 target. It is important to note that the Scoping Plan was released before EO B-55-18 was announced, which sets a target of carbon neutrality by 2045. Therefore, all future target years in the scoping plan refer to 2030 and 2050.

The 2017 Climate Change Scoping Plan provides the following updated guidance on target-setting for local governments:

*“Recommended Local Plan-Level Greenhouse Gas Emissions Reduction Goals:*

*CARB recommends statewide targets of no more than six metric tons CO<sub>2</sub>e per-capita by 2030 and no more than two metric tons CO<sub>2</sub>e per-capita by 2050. The statewide per-capita targets account for all emissions sectors in the State, statewide population forecasts, and the statewide reductions necessary to achieve the 2030 statewide target under SB 32 and the longer-term State emissions reduction goal of 80% below 1990 levels by 2050.*

*[...] CARB recommends that local governments evaluate and adopt robust and quantitative locally-appropriate goals that align with the statewide per-capita targets and the State's sustainable development objectives and develop plans to achieve the local goals. The statewide per-capita goals were developed by applying the percent reductions necessary to reach the 2030 and 2050 climate goals (i.e., 40 percent and 80 percent, respectively) to the State's 1990 emissions limit established under AB 32.*

*Numerous local governments in California have already adopted GHG emissions reduction goals for year 2020 consistent with AB 32. **CARB advises that local governments also develop community-wide GHG emissions reduction goals necessary to reach 2030 and 2050 climate goals. Emissions inventories and reduction goals should be expressed in mass emissions, per-capita emissions, and service population emissions.** To do this, local governments can start by developing a community-wide GHG emissions target consistent with the accepted protocols as outlined in OPR's General Plan Guidelines Chapter 8: Climate Change. They can then calculate GHG emissions thresholds by applying the percent reductions necessary to reach 2030 and 2050 climate goals (i.e., 40 percent and 80 percent, respectively) to their community-wide GHG emissions target. Since the statewide per-capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the State, it is appropriate for local jurisdictions to derive evidence-based **local per-capita goals** based on local emissions sectors and population projections that are consistent with the framework used to develop the statewide per-capita targets. The*

<sup>18</sup> 62 Cal. 4th 204.

<sup>19</sup> *Id.* at 225-228 (EIR must compare the specific project's expected emissions to the existing physical environment in the project's vicinity – at a specific location - rather than a hypothetical business as usual (BAU) scenario based on statewide assumptions).

*resulting GHG emissions trajectory should show a downward trend consistent with the statewide objectives.”<sup>20</sup>*

This guidance recommends that emissions inventories and reduction goals should be expressed in mass emissions, per-capita emissions, and service population emissions. It goes on to recommend the use of an intensity target approach to derive local GHG targets for 2030 and 2050 target years and suggests that local governments that had been using a 2020 target and planning horizon should update to targets that are focused on the 2030 and 2050 State goals. It also refers to OPR’s recommendation that local governments define mass and intensity targets for the GHG reduction analyses that consider local emission sources and population projections. The use of such targets as defined therein is consistent with the State’s GHG goals, as well as the previously signed Under 2 Memorandum of Understanding (MOU)<sup>21</sup> international agreement and the Paris Agreement.<sup>22</sup>

### Office of Planning and Research (OPR) General Plan Guidelines

The OPR General Plan Guidelines include a chapter on climate change that describes target-setting considerations for local governments.<sup>23</sup> The Guidelines suggest that target-setting should be context-specific and tailored to a community’s unique characteristics, while relating to the State’s GHG targets to demonstrate that the CAP’s emissions will be less than significant for CEQA purposes. The Guidelines recommend that readers refer to the Scoping Plan’s guidance for local action, choose multiple target years such as 2030 and 2050, provide a narrative that justifies the use of a specific baseline year, and analyze a community’s mass emissions and emissions intensity to support a fuller understanding of the issue. It is worth noting that OPR’s guidance **does not** define required targets for local governments to include in their CAPs.

## City’s Emissions Profile

Davis’s 2016 base year emissions inventory was developed in accordance with the methodologies presented in ICLEI’s July 2019 publication of the *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions*.

As shown in Table 2, the City’s 2016 total emissions were 467,598 MT CO<sub>2</sub>e with the majority coming from transportation (74%) and building energy use (19%). The remaining 7% comes from solid waste and water.

Table 2 City of Davis 2016 Greenhouse Gas Inventory		
Sector	MT CO <sub>2</sub> e/yr	%
<b>Energy</b>	<b>86,405</b>	<b>18.5%</b>
Residential	60,009	12.8%
Commercial	26,396	5.6%
<b>Transportation</b>	<b>346,780</b>	<b>74.2%</b>

<sup>20</sup> California Air Resources Board. *The 2017 Climate Change Scoping Plan*, page 99-100. Available: [https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping\\_plan\\_2017.pdf](https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf). Accessed August 10, 2020.

<sup>21</sup> The Under 2 Memorandum of Understanding (MOU) is a subnational climate agreement developed by the Under2 Coalition to limit global temperature increases to less than 2°C through agreements from signatories to reduce their GHG emissions to 80-95% below 1990 levels by 2050 or limit to 2 MT CO<sub>2</sub>e/capita per year by 2050. Available: <http://under2mou.org/>

<sup>22</sup> The Paris Agreement is an international agreement developed through the United Nations Framework Convention on Climate Change to keep global temperature rise this century below 2°C, and pursue efforts to limit temperature increases to 1.5°C. The Paris Agreement is based on nationally determined contributions to achieve its goal, which represent the ratifying parties’ best efforts toward addressing climate change. Available: [http://unfccc.int/paris\\_agreement/items/9485.php](http://unfccc.int/paris_agreement/items/9485.php)

<sup>23</sup> The Governor’s Office of Planning and Research. *General Plan Guidelines, Chapter 8 Climate Change*. 2017. Available: [https://opr.ca.gov/docs/OPR\\_COMPLETE\\_7.31.17.pdf](https://opr.ca.gov/docs/OPR_COMPLETE_7.31.17.pdf)

<b>Table 2</b>		
<b>City of Davis 2016 Greenhouse Gas Inventory</b>		
<b>Sector</b>	<b>MT CO<sub>2</sub>e/yr</b>	<b>%</b>
On-road	321,955	68.9%
Off-road	24,825	5.3%
<b>Solid Waste</b>	<b>14,609</b>	<b>3.1%</b>
<b>Water</b>	<b>19,804</b>	<b>4.2%</b>
<b>Total</b>	<b>467,598</b>	<b>100%</b>

As described above, the source of local emissions should be considered when setting GHG targets since the City has more influence over some sources than others. For example, local building codes can be designed to reduce energy emissions from residential and commercial buildings, or incentive programs could be implemented to encourage trade ins of less efficient personal vehicles for high-efficiency or alternative fuel vehicle options. In contrast, a local government might have limited ability to influence technologies or fuels used in the rail sector. These considerations are especially important for cities considering a net-zero or carbon neutrality GHG target; emissions sources that cannot be reduced would need to be removed in other ways in order to demonstrate target achievement (see the section Community-scale Carbon Neutrality above for further detail).

## Target Timeframes

Local GHG targets can be set to align with various objectives, such as State GHG goals, local funding cycles, or long-term planning horizons. From an implementation standpoint, most CAAPs are designed with near- or medium-term (5-20 years) and long-term (20+ year) targets to provide waypoints for progress tracking. With this approach, it is helpful to identify the final target (long-term target) up front, and then set a series of interim targets (near- and medium-term targets) that lead to it. This ensures that near-term targets are aggressive enough to make progress toward the long-term target and supports strategic thinking on early-action items that will provide long-term benefits.

California's GHG target years are 2020, 2030, and 2045/2050.<sup>24</sup> The City of Davis has identified a 2040 carbon neutrality target and the CAAP update will include an interim 2030 GHG target to align with the SB 32 target year.

## Other Local Government Targets

In addition to the guidance provided by State agencies, it can be helpful to consider the GHG targets of other local governments when defining a target because it reinforces the notion that cities are not acting alone, and therefore, are not putting themselves at a regional economic disadvantage through their climate change response. It is also important to consider the context of other cities' targets, including their base year, the types of reduction strategies included in their plans, and how they treat statewide actions, when referencing them as the basis for local target setting.

Table 3 shows different GHG targets from neighboring jurisdictions.

<sup>24</sup> Executive Order S-3-05 from 2005 set a 2050 GHG target of 80% below 1990 levels. More recently, EO B-55-18 has set a target of carbon neutrality by 2045. Neither Executive Order represents a GHG target codified by the legislature, as with the targets established in AB 32 (return to 1990 levels by 2020) and SB 32 (40% below 1990 levels by 2030).

Table 3 Other Local Government Greenhouse Gas Targets						
City Name (CAP Year)	Target Type	Target Year				
		2030	2035	2040	2045	2050
City of Sacramento (2020) <sup>25</sup>	TBD	-	-	-	Carbon Neutral	-
City of West Sacramento (In Development)	TBD	-	-	-	Carbon Neutral	-
City of Woodland (2017)	Emissions Intensity	-	1.25 MT CO <sub>2</sub> e/service population	-	-	-
Yolo County (2011)	Mass Emissions	27% below 1990 levels		53% below 1990 levels		80% below 1990 levels

To align with EO B-55-18, cities in California are now moving away from former statewide 2050 reduction targets towards ambitious carbon neutral targets. The Cities of Sacramento and West Sacramento are currently developing interim targets and CAP updates to achieve their shared carbon neutral goals established through the recent Mayors' Commission on Climate Change, and the Yolo County Board of Supervisors voted to pursue a carbon-negative footprint by 2030 but have not yet developed a plan for that target's achievement. The City of Winters and Sacramento County are also working to prepare communitywide CAPs that align with state goals.

## 2030 Target Options for Davis

Table 4 on the following pages presents several target options for the 2030 interim target year. The OPR General Plan Guidelines and the CARB 2017 Scoping Plan recommend that cities should analyze mass emissions, per-capita emissions, and service population emissions to support a full understanding of community emissions. Representing more than one target type in a CAAP can aid in ensuring emissions reductions are aligning with multiple tracking methodologies.

Target Options A through D include a set of local targets derived from the State's adopted 2030 GHG target of 40% reduction from 1990 levels. Relevant considerations are provided for each option in order to describe whether the potential targets might be appropriate for use at the local level.

We preliminarily recommend Target Option C because it aligns with the most current guidance from CARB, OPR, and indirectly with the California Supreme Court's Newhall Ranch decision<sup>26</sup>; is tailored to match the emissions sectors included locally in the City's inventory; and provides an easy calculation metric for tracking future target progress. Target Options A and D are worth considering and revisiting once CAP action analysis is underway. We do

<sup>25</sup> The City of Sacramento and West Sacramento are currently updating their Climate Action and Adaptation Plans and interim GHG reduction targets.

<sup>26</sup> The Newhall Ranch case was not about a communitywide climate action plan, but rather a new development project and that project's GHG threshold. This is an important distinction because communitywide CAPs consider emissions from existing and future development, whereas a project's CEQA analysis only considers emissions from new development associated with the project. However, the guidance provided in the Newhall Ranch case decision is still interpreted as a good analog for CAP target setting because it affirms the connection between the State's GHG legislative framework, local agency determination, and CEQA determination.

not recommend Target Option B, which would directly apply the State’s SB 32 target year per capita emissions level to the Davis context, because it fails to tailor the target to the local emissions context as recommended in the 2017 Scoping Plan guidance.

Table 4 2030 Greenhouse Gas Target Options			
Option	Target	Considerations	Recommendation
<b>Target Option A – SB 32 2030 Mass Emissions Target</b>			
2030	40% below 2016 levels	As the State’s recent inventories show that California returned to 1990 levels between 2015-2016 (and has remained below that level through 2018), we can assume that Davis also returned to 1990 levels in this same time frame and could use the 2016 inventory as a proxy for the City’s 1990 emissions.	Maybe
<b>Target Option B – 2017 Scoping Plan Intensity Targets</b>			
2030	6.0 MT CO <sub>2</sub> e/capita	Not an appropriate use of ARB guidance in 2017 Scoping Plan Update because target assumes all statewide inventory sectors are included in local inventory; City’s inventory only includes a sub-set of statewide sectors	No
<b>Target Option C – Local Emissions Source-Based Intensity Targets</b>			
2030	5.2 MT CO <sub>2</sub> e/capita; 3.5 MT CO <sub>2</sub> e/SP	Calculates per-capita and per service population emissions targets based on sub-set of statewide emissions sectors that will be included in City’s inventory. This approach follows the target tailoring guidance recommended in the 2017 Scoping Plan.	Recommended
<b>Target Option D – Local Emissions (without Passenger Vehicles) Intensity Targets</b>			
2030	3.7 MT CO <sub>2</sub> e/capita; 2.5 MT CO <sub>2</sub> e/SP	Calculates per capita and per service population emissions targets based on sub-set of statewide emissions sectors that will be included in City’s inventory, excluding passenger cars and light duty trucks, which will be addressed at the regional level through SB 375 legislation <sup>27</sup>  <i>Note: This option proposes removing only the passenger vehicle emissions from consideration and not mobile emissions from other types of vehicles. This would remove only GHG emissions that are specifically addressed through the SB 375 process.</i>	Maybe

<sup>27</sup> The Sustainable Communities and Climate Protection Act of 2008 (SB 375) directs the California Air Resources Board to set regional targets for GHG reductions from passenger vehicles. The targets are designed to align with the State’s GHG reduction targets and are implemented through a Regional Transportation Plan/Sustainable Communities Strategy prepared by California’s metropolitan planning organizations, including the Sacramento Area Council of Governments of which Davis is a member.