REGIONAL CLIMATE ACTION PLANNING FRAMEWORK

ABOUT THE FRAMEWORK

In recent years, nearly all of the San Diego region's 19 local governments have adopted a climate action plan (CAP), or are in the process of creating one. Local agency staff members and elected officials have communicated that their ongoing efforts to adopt, update, and monitor the implementation of their plans would benefit from regionally consistent approaches, methodologies, and data sources. In response, the San Diego Association of Governments (SANDAG) has collaborated with local agency staff and leading climate planning experts to prepare this Regional Climate Action Planning Framework (ReCAP) that identifies best practices and guidance for preparing CAPs and monitoring their implementation over time. This guidance document establishes a technical framework for regionally-consistent climate action planning that preserves policy flexibility for the unique needs and circumstances of each local jurisdiction.

ReCAP guiding principles:

- Transparency – clear methodologies and assumptions
- Data-driven – methodologies are based on relevant and accurate scientific data
- Regional consistency – consistency with other regional planning efforts
- Use of accepted methods – developed using State guidance
- Local relevancy – a helpful resource for local agency staff
- Flexibility and adaptability – reflects the iterative process of climate action planning

LOOK FOR THIS ICON THROUGHOUT THE ReCAP TO KNOW WHICH TECHNICAL APPENDIX TO REFER TO FOR FURTHER INFORMATION.

The ReCAP has six technical appendices that provide detail on all topics covered in the ReCAP.

The appendices are:

I. Greenhouse Gas (GHG) Inventories, Projections, and Target Selection

II. GHG Reduction Calculation Methods for CAP Measures

III. Benefit-Cost Analysis for CAP Measures

IV. CAP Implementation Cost Analysis

V. California Environmental Quality Act (CEQA) and Climate Action Planning

VI. CAP Monitoring and Reporting

ReCAP is provided to SANDAG member agencies through the Energy Roadmap Program. Since 2010, the SANDAG Energy Roadmap Program has provided member agencies with voluntary, no-cost energy assessments, known as "Energy Roadmaps." Each Energy Roadmap provides strategies, unique to each local government, to reduce energy use in municipal operations and in the community.

As the Energy Roadmaps were completed for the local jurisdictions in the region, the demand to implement the Energy Roadmaps and assist in the development and implementation of CAPs increased. In 2016, the Energy Roadmap Program was expanded to include no-cost climate action planning services.

SDGE
A Sempra Energy utility®

The Energy Roadmap Program is primarily funded by California utility customers and administered by the San Diego Gas & Electric® Company under the auspices of the California Public Utilities Commission.

WHAT IS A CLIMATE ACTION PLAN?

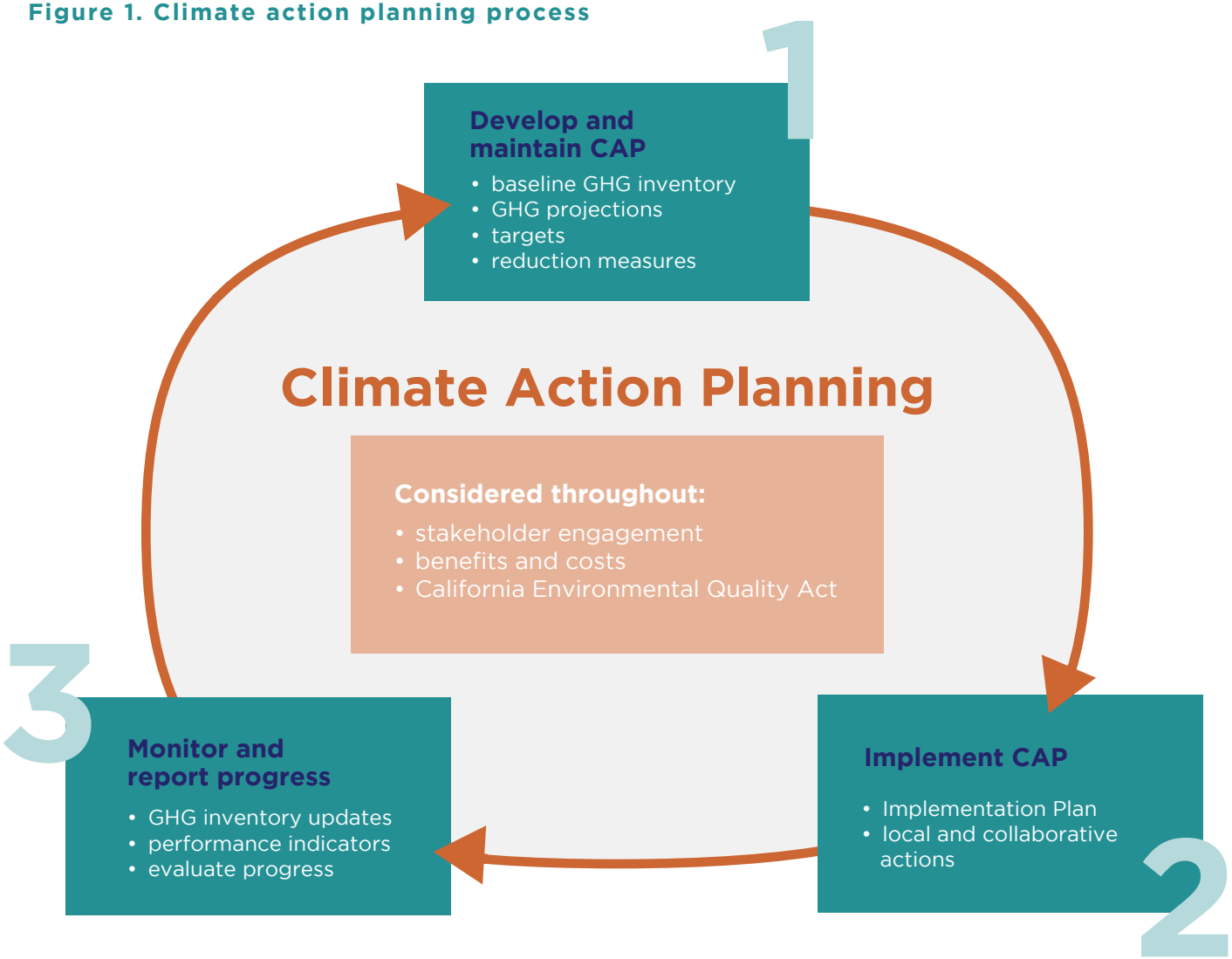
A CAP is a comprehensive policy document that outlines the actions a jurisdiction will take to reduce GHG emissions. CAPs are commonly prepared by jurisdictions to show how local goals and policies align with statewide targets for GHG reductions. CAPs also have been prepared to show how a jurisdiction will mitigate for the GHG emissions of a large-scale plan, like a General Plan. CAPs typically follow a similar format, and specific content within a CAP is tailored to each jurisdiction's individual needs and circumstances.

The main elements of a CAP are:

- GHG inventory and projections
- GHG reduction targets
- GHG reduction measures
- Implementation and monitoring steps

Many CAPs also include sections on climate change vulnerabilities, resiliency, and adaptation. Adopting a CAP marks the beginning of an iterative process of implementing, monitoring, and updating the CAP. Figure 1 provides an overview of the climate action planning process; more details on each topic are provided within the ReCAP.

Figure 1. Climate action planning process



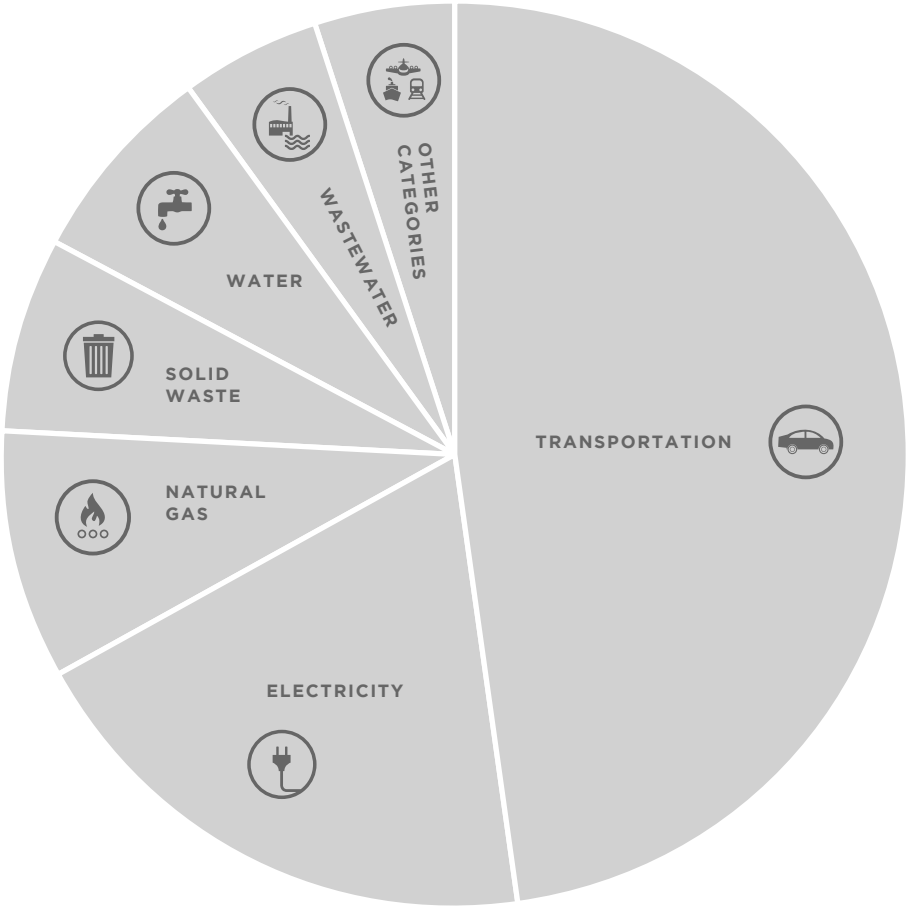
INVENTORIES

A GHG emissions inventory is a snapshot reference of the annual emissions associated with a jurisdiction's community-wide activities. GHG emissions inventories are a critical component of the CAP process used to establish reduction targets/goals and monitor emissions over time.

Local government GHG inventories are based on activities that a jurisdiction has control over taking place within its boundaries. However, there are emissions associated with federal and special entities (e.g., public universities, tribal nations, airports, port districts, transit agencies) which may be addressed outside of a conventional local inventory. An inventory for a special district may include unique categories of emissions not represented in local inventories.

GHG emissions originate from a variety of sources, all of which are documented, quantified, and analyzed within a GHG inventory. A typical GHG inventory for a local agency captures emissions from transportation, electricity, natural gas, water, wastewater, and solid waste activities. GHG emissions are calculated in metric tons of carbon dioxide equivalent (MT CO_2e). Data and estimates from different organizations (e.g., SANDAG, San Diego Gas & Electric [SDG&E®], local jurisdiction departments) are needed to complete an inventory. Inventories are developed based on the best available data and methods, which change over time and should be accounted for when comparing inventory years.

FOR MORE INFORMATION ON GHG INVENTORIES, SEE TECHNICAL APPENDIX I.



To learn more about each inventory category, click on each icon for data inputs and sources.

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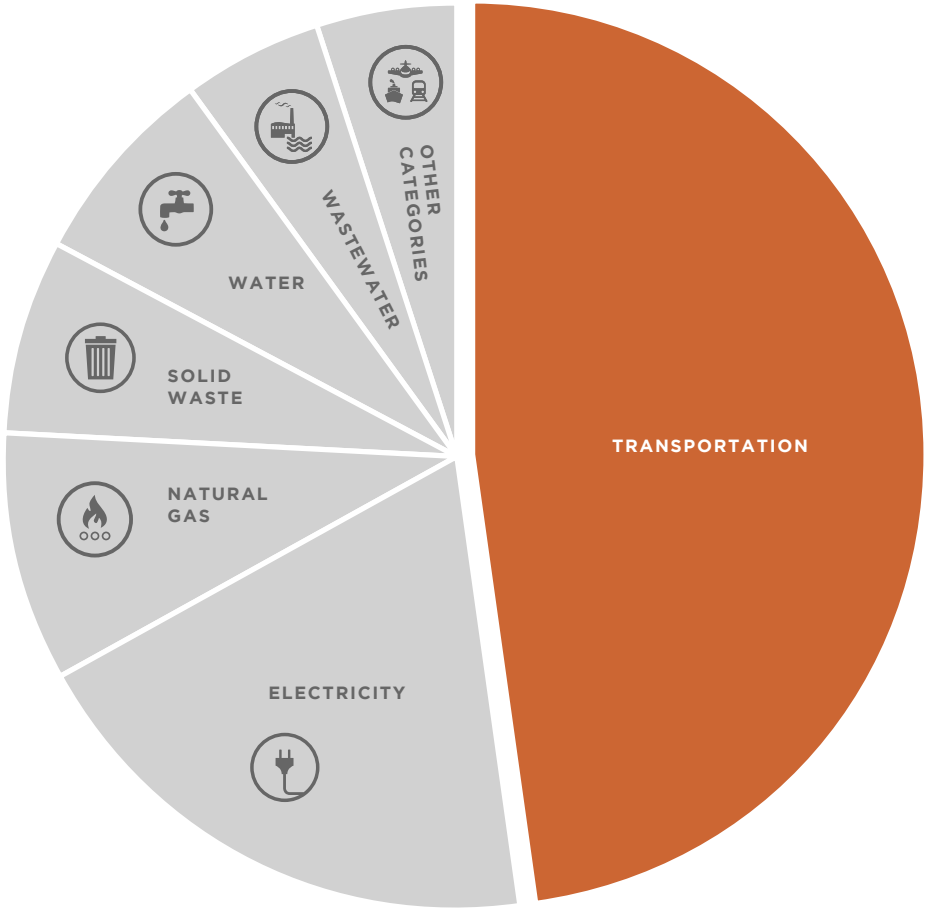
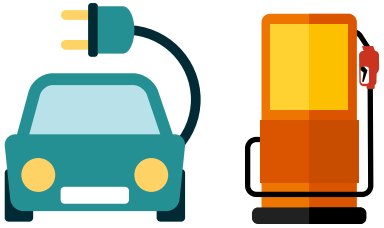


- largest source of emissions
- **source**: on-road vehicles



- **emissions based on**: regional vehicle types and fuel types

- **source data measured in**: vehicle miles traveled (VMT)

- **key data input**: SANDAG Regional Travel Demand Model
- Origin-Destination methodology allocates VMT to jurisdictions

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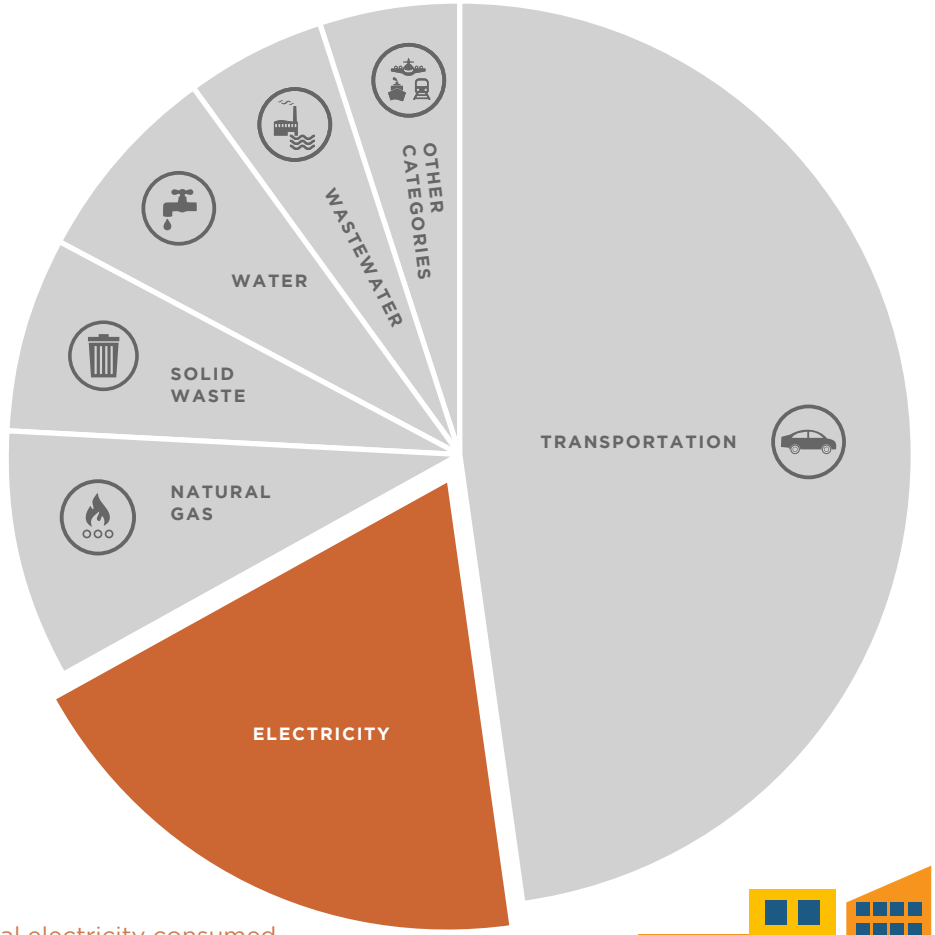
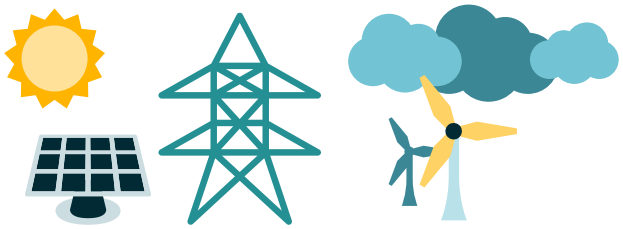


- **source**: total electricity consumed
- **emissions based on**: amount of renewable and non-renewable electricity
- **source data measured in**: kilowatt hours



- **key data input**: SDG&E®, local electricity provider

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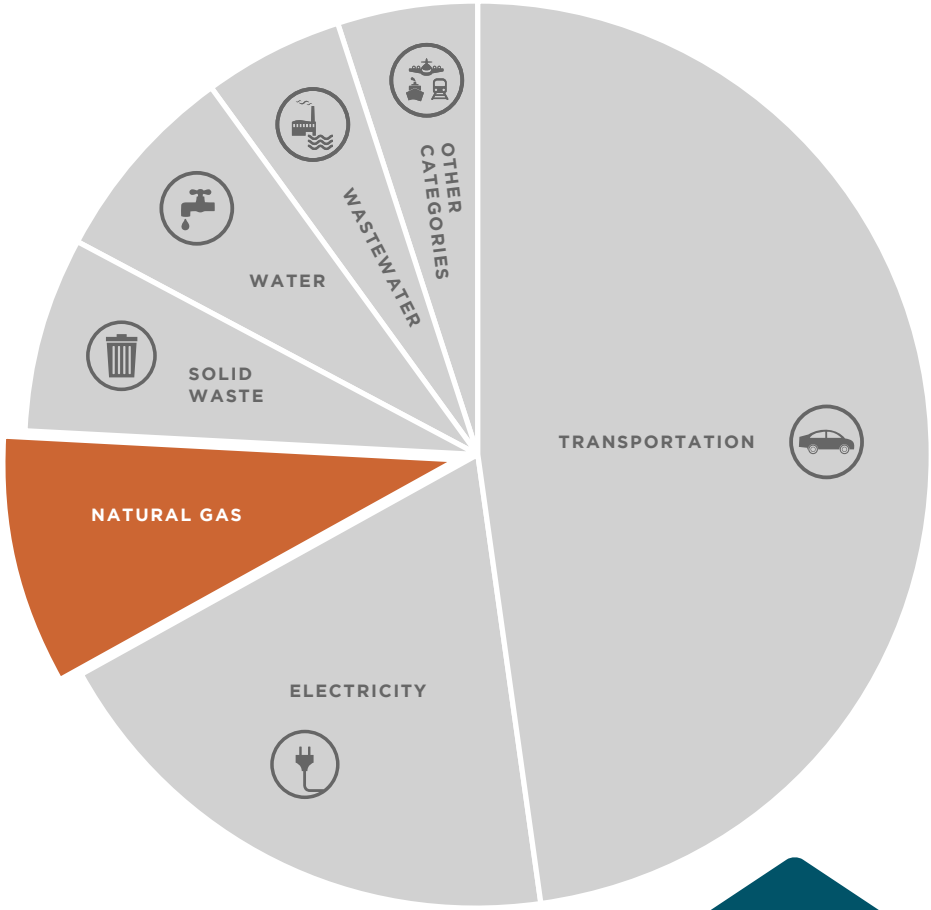

- **source**: total end-use natural gas consumed (or burned)
- **emissions based on:** heat content of fuel
- **source data measured in**: therms
- **key data input**: SDG&E®

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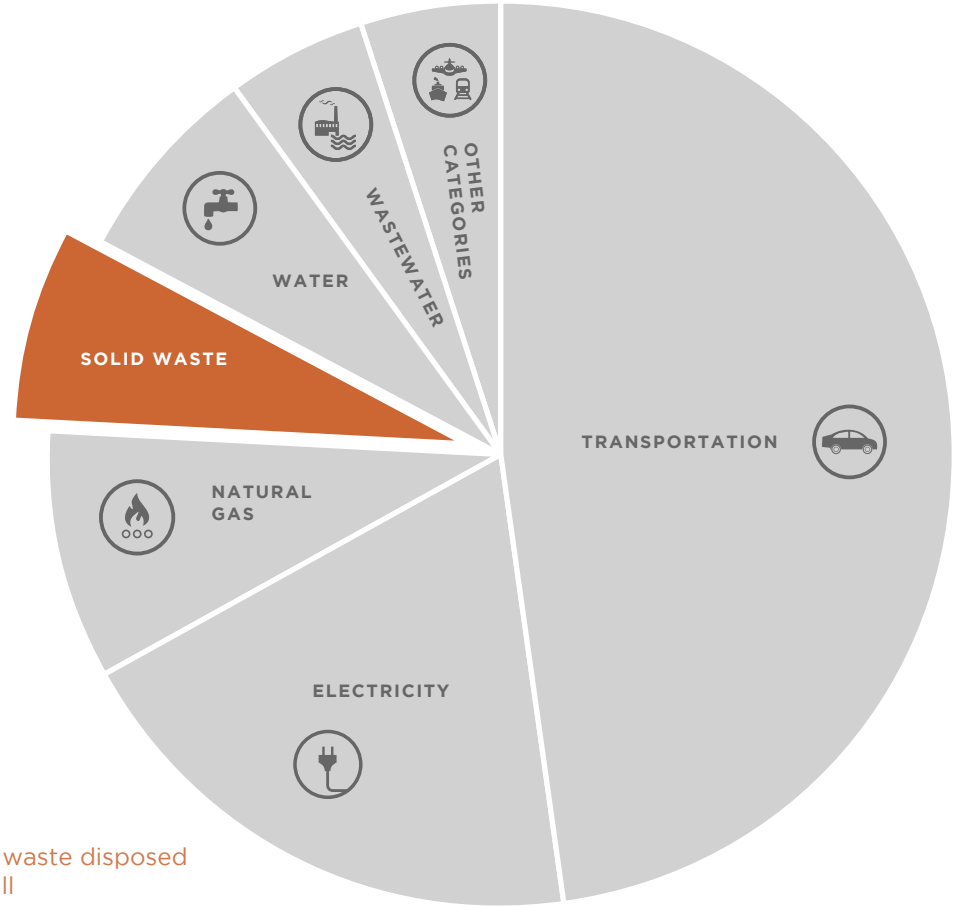

- **source**: waste disposed in landfill
- **emissions based on**: composition of waste and gas capture at landfills
- **source data measured in**: tons
- **key data input**: CalRecycle

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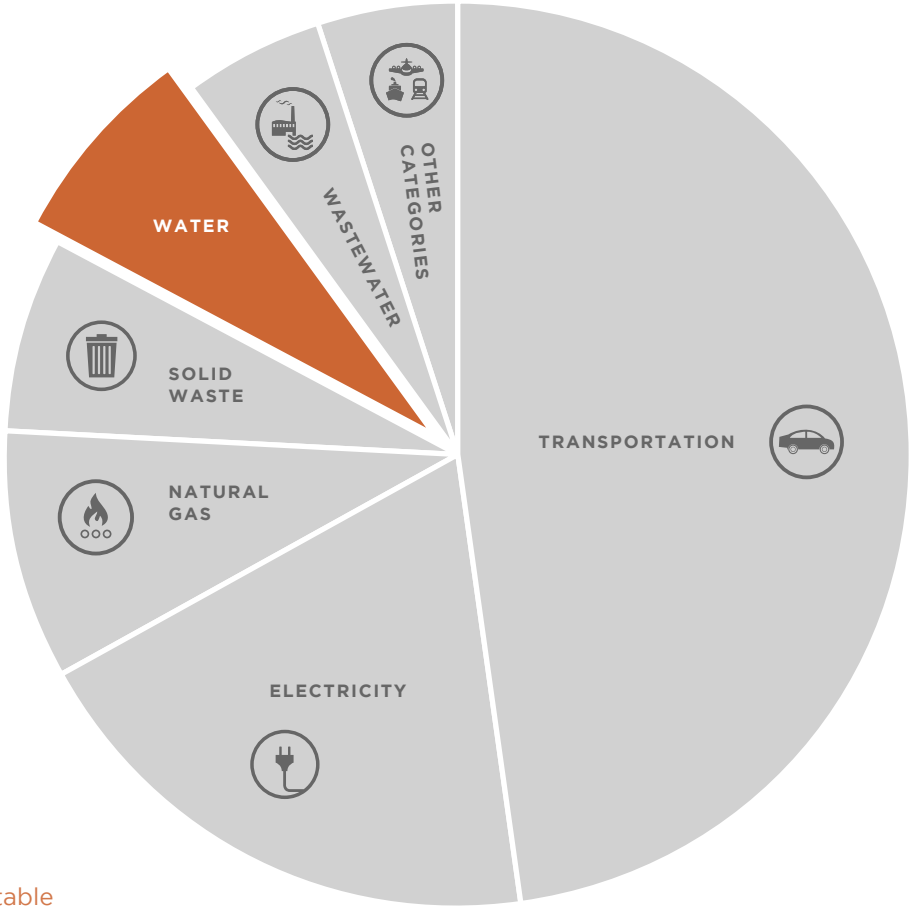
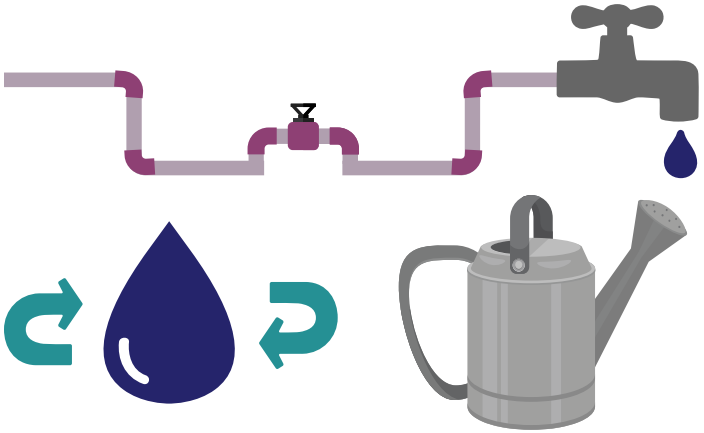


- **source**: potable and recycled water
- **emissions based on**: energy to move, treat, and pump water
- **source data measured in**: gallons
- **key data input**: local water districts
- each water district has different water sources



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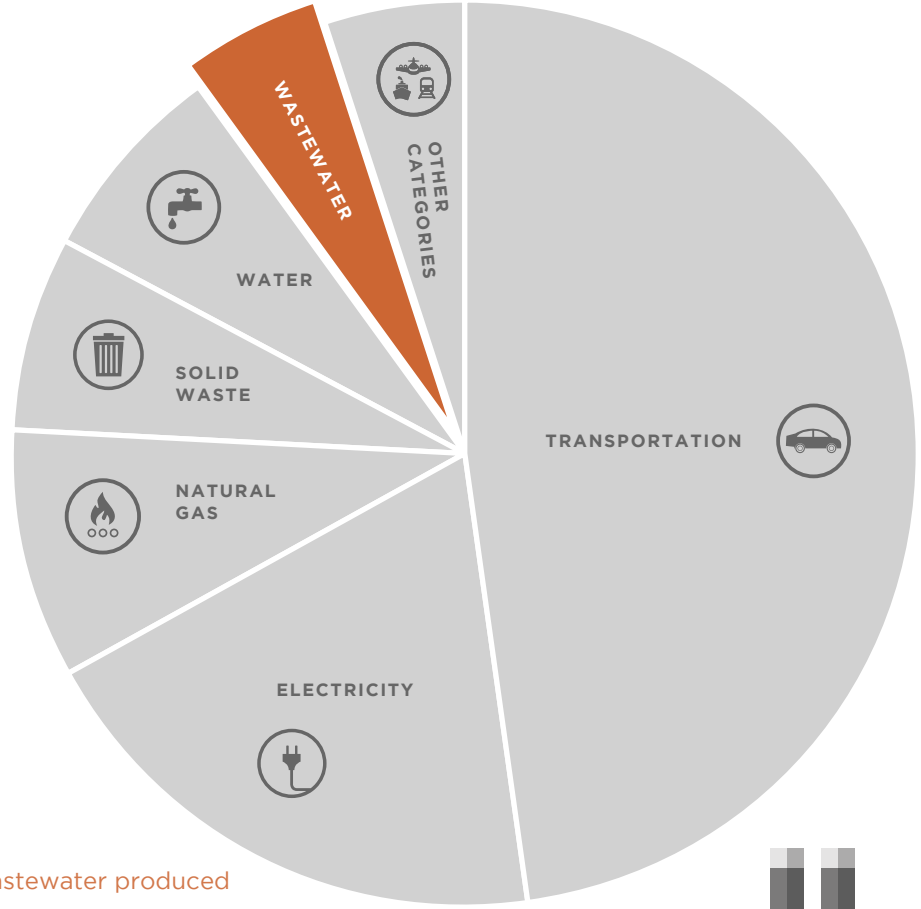
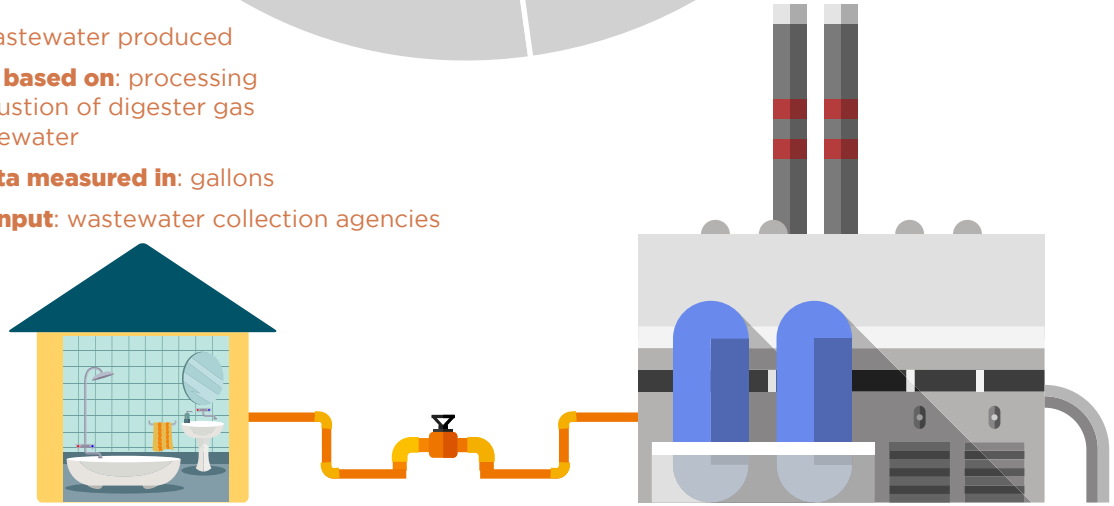


- **source**: wastewater produced
- **emissions based on**: processing and combustion of digester gas from wastewater
- **source data measured in**: gallons
- **key data input**: wastewater collection agencies



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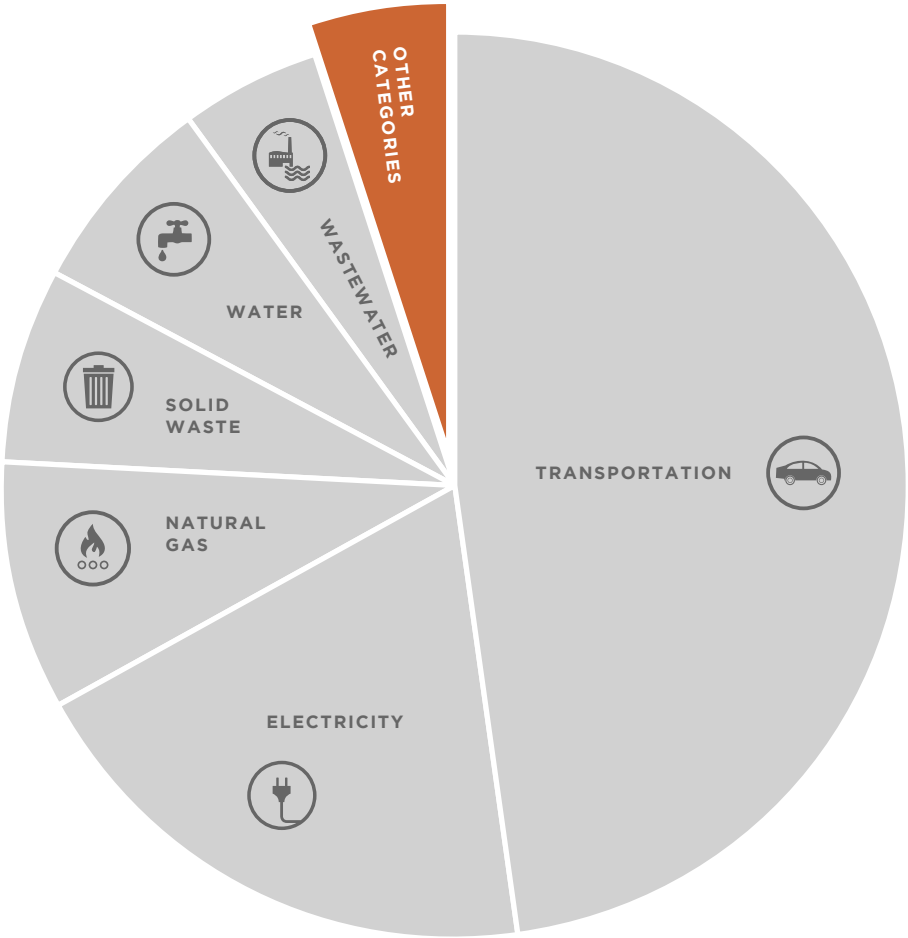
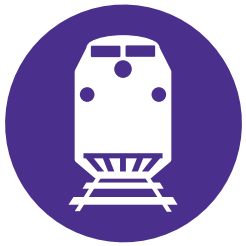
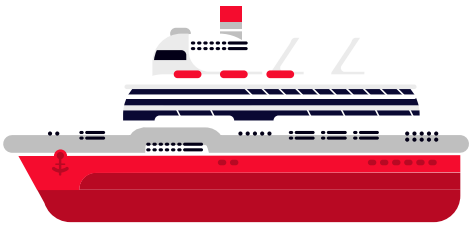


Other categories of emissions that are included in the regional inventory and, as appropriate, for local inventories include: industrial, agriculture, off-road equipment and vehicles, civil aviation, rail, land use/wildfire, and marine vessels.





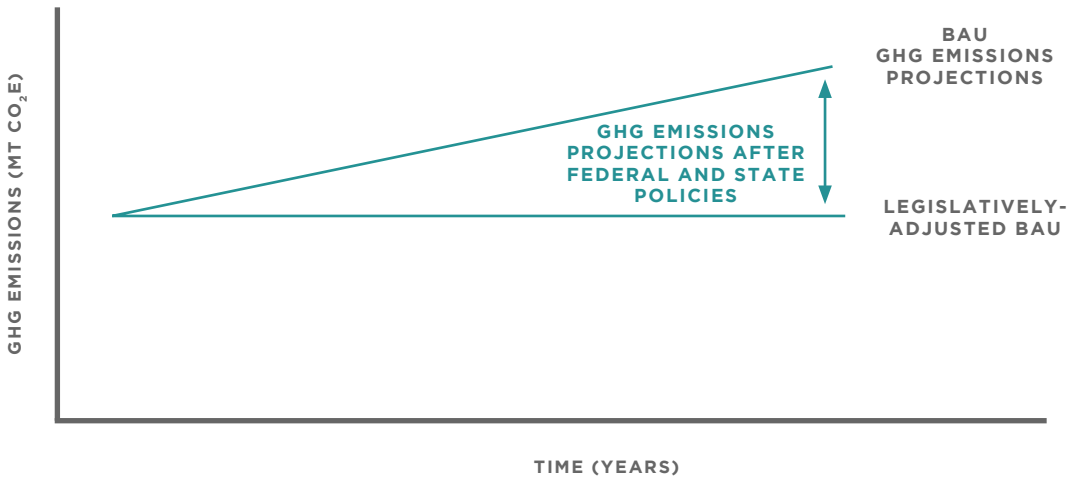
BASELINE YEAR & PROJECTIONS

The baseline year for a CAP is the starting point for tracking activities within the CAP. Reduction targets are calculated in relation to the baseline year emissions. Using the baseline GHG inventory and estimates for population, housing, and job growth from the Regional Growth Forecast, CAPs include emissions projections into the future. First, a business-as-usual (BAU) projection demonstrates emissions growth in the absence of any new policies and programs. Next, emissions reductions from federal and State policies and programs are applied in the future, creating a legislatively-adjusted BAU. An illustration of this is seen in Figure 2.

SANDAG updates the Regional Growth Forecast every four years. Federal and State policies change regularly. Updating projections can allow for a better understanding of these impacts on future GHG emissions.

FOR MORE INFORMATION ON EMISSIONS PROJECTIONS, SEE TECHNICAL APPENDIX I.

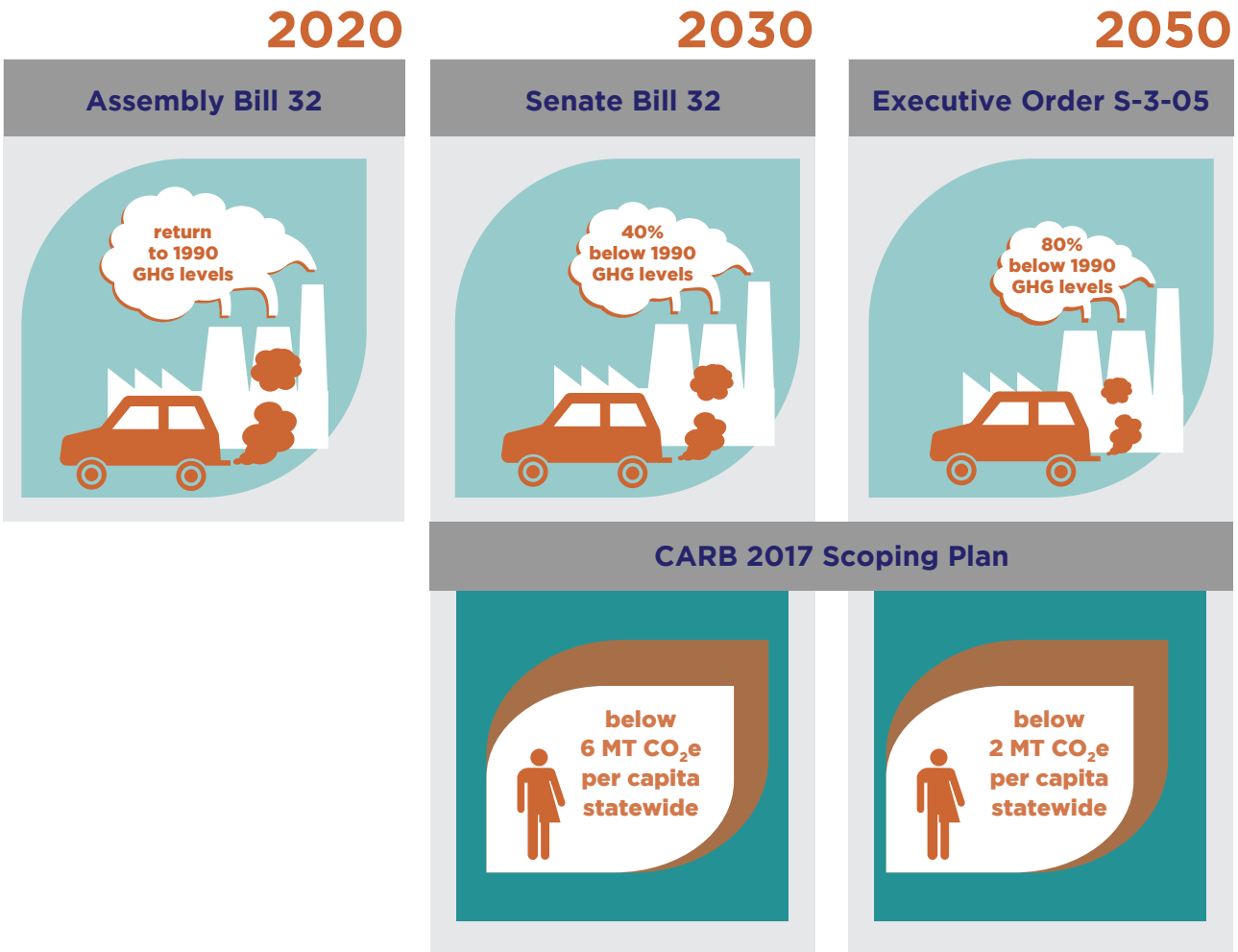
Figure 2. BAU & legislatively-adjusted GHG emissions projections



EMISSIONS REDUCTION TARGETS

In 2005, California's Governor issued statewide GHG reduction goals for 2020 and 2050. More recently, the State Legislature established a statewide target for 2030, while the California Air Resources Board (CARB) developed statewide per capita targets for 2030 and 2050, as depicted below. These limits represent California's contribution (or "fair share") to international agreements to reduce GHG emissions to the scientifically-based levels to limit global warming below two degrees Celsius.

State GHG reduction goals *(as of 2018)*



Target-setting for local climate action plans

CARB's guidance on target-setting for local CAPs preserves local jurisdictions' discretion in selecting reduction targets, yet offers recommended approaches for aligning local targets with the statewide goals. While these goals reference a 1990 baseline, local jurisdictions typically establish reduction targets from a current baseline using accepted methods. The following summarizes voluntary guidance to local governments on establishing GHG reduction targets from CARB's 2017 Scoping Plan:

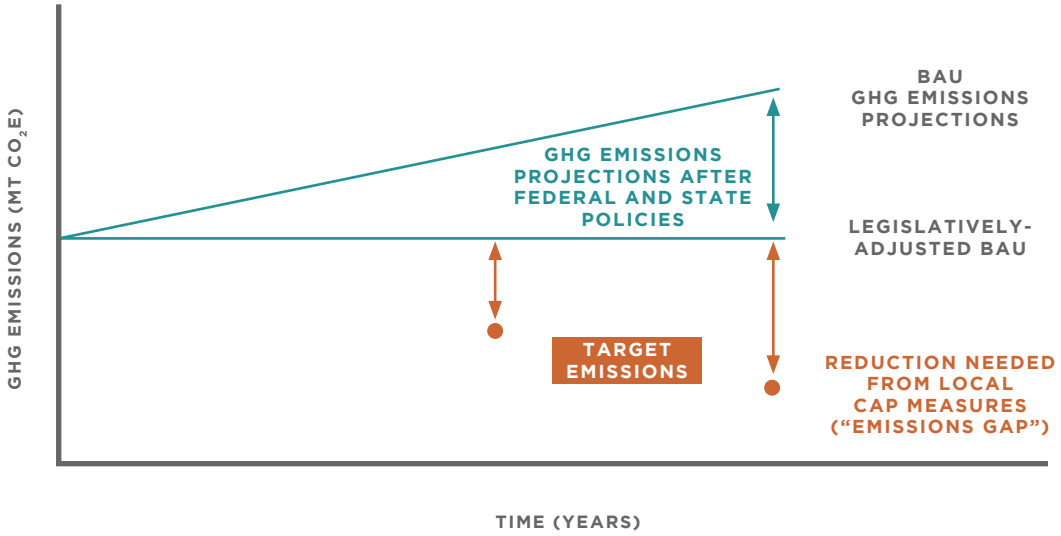
- Evaluate and adopt robust, locally-appropriate emissions reduction goals based on local inventory categories
- Express goals in mass emissions, per capita emissions, and service population emissions
- Show a downward-trending GHG emissions trajectory consistent with the statewide goals

FOR MORE INFORMATION ON EMISSIONS REDUCTION TARGETS, SEE TECHNICAL APPENDIX I.

CLOSING THE GAP

Once emissions targets have been established, the next step in the climate action planning process is to identify the GHG reduction strategies that will achieve the targets. Federal, State, and local activities have a role to play in achieving GHG emissions reductions for a local jurisdiction. Before developing local strategies, the GHG reduction impact of federal and State policies and programs is quantified at the local level. While other agencies are responsible for implementing federal and State strategies, the local GHG reduction impact should be included in local CAPs. The difference between the legislatively-adjusted BAU and the emissions reduction targets is known as the "emissions gap," as shown in Figure 3. Jurisdictions typically consider several GHG reduction measures within many categories and must determine which suite of measures will "close the gap" while aligning with other priorities for the community.

Figure 3. Emissions gap to meet CAP targets



GHG REDUCTION STRATEGIES & MEASURES

There are many considerations for selecting local reduction measures, including:

- GHG reduction potential
- ability, time, and cost to implement
- available funding
- community priorities
- co-benefits (positive external impacts)
- ability to monitor

A master list of reduction measures is available in Technical Appendix II.

While there are similarities in GHG reduction strategies across local CAPs, the measures within each CAP are uniquely crafted based on local needs and conditions.

To read about California's 2030 vision (as set forth in CARB's 2017 Scoping Plan) and sample local CAP measures, click on the icons to reveal more information.

FOR MORE INFORMATION ON METHODS TO CALCULATE GHG REDUCTION MEASURES, SEE TECHNICAL APPENDIX II.

TRANSPORTATION

ELECTRICITY

NATURAL GAS

SOLID WASTE

WATER

WASTEWATER

OTHER CATEGORIES

Strategies

cleaner fuels, increased vehicle fuel economy, reduced VMT growth

California's 2030 Vision

high density, transit-oriented housing; walkable and bikable communities; on-road gasoline demand reduced by half; zero-emission bus fleet; five million affordable electric cars on the road; 18 percent carbon intensity reduction in fuels

San Diego Forward: The Regional Plan

investments in regional transit systems, active transportation, roadway improvements, transportation demand management, transportation systems management, smart growth grants, electric vehicle charging

Example Local CAP Measures

promote public transit, increase active transportation, advance smart growth, provide infrastructure for electric and alternative fuel vehicles

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WATER

WASTEWATER

OTHER CATEGORIES

Strategies

reduce electricity use, cleaner electricity sources

California's 2030 Vision

at least 50 percent renewable electricity, double energy-efficiency in buildings

SANDAG Energy Roadmap Program

implement energy-saving opportunities in municipal facilities, promote community-wide energy-saving programs

Example Local CAP Measures

benchmark buildings, establish building efficiency standards, set renewable energy goals, install solar photovoltaics

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WATER

WASTEWATER

OTHER CATEGORIES

Strategies

increase natural gas end-use efficiency

California's 2030 Vision

reduce fugitive methane emissions and system leaks, increase production and use of renewable gas, replace natural gas end-use with electricity

Example Local CAP Measures

mandate requirements for new development, install solar water heaters, increase renewable energy use

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OTHER CATEGORIES

Strategies

reduce amount of solid waste going to landfills, increase methane capture from landfills, increase recycling

California's 2030 Vision

75 percent organic waste diversion from landfills, increase use of renewable gas, reduce amount of edible food sent to landfills, develop a packaging reduction goal

Example Local CAP Measures

adopt zero waste policy, increase composting, mandate waste recycling, divert construction waste, re-use captured methane

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To read about California's 2030 vision (as set forth in CARB's 2017 Scoping Plan) and sample local CAP measures, click on the icons to reveal more information.

FOR MORE INFORMATION ON METHODS TO CALCULATE GHG REDUCTION MEASURES, SEE TECHNICAL APPENDIX II.

TRANSPORTATION

ELECTRICITY

NATURAL GAS

SOLID WASTE

WATER

WASTEWATER

OTHER CATEGORIES

Strategies

reduce water use, diversify water supply sources

California's 2030 Vision

develop and implement new water use targets beyond 20 percent reduction of existing goal, minimize water system leaks, develop a long-term water conservation regulation, update appliance efficiency regulations

Example Local CAP Measures

conserve water, adopt outdoor landscape ordinance, collect rainwater, increase use of recycled water

GHG REDUCTION STRATEGIES & MEASURES

There are many considerations for selecting local reduction measures, including:

- GHG reduction potential
- ability, time, and cost to implement
- available funding
- community priorities
- co-benefits (positive external impacts)
- ability to monitor

A master list of reduction measures is available in Technical Appendix II.

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TRANSPORTATION

ELECTRICITY

NATURAL GAS

SOLID WASTE

WATER

WASTEWATER

OTHER CATEGORIES

Strategies

reduce amount of wastewater, capture/re-use of methane

California's 2030 Vision

recover methane from wastewater treatment facilities

Example Local CAP Measures

increase methane capture at treatment plants

GHG REDUCTION STRATEGIES & MEASURES

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OTHER CATEGORIES

California's 2030 Vision

15-20 million MT CO_2e reductions from natural and working lands restoration; 40 percent reduction in methane and other "super pollutants"; Sustainable Freight; transitioning to zero emissions where feasible, and near-zero emissions with renewable fuels everywhere else; cap-and-trade; firm limit on 80 percent of emissions

Example Local CAP Measures

increase urban tree canopy cover, conserve open space

CONSIDERING COSTS

A benefit-cost analysis and implementation cost analysis can help guide the selection of GHG reduction measures during CAP development, or inform CAP implementation.The main questions addressed in these cost analyses are:

- For each CAP measure, what is the benefit or cost to reduce one MT CO_2e?
- What are the financial impacts to participants (e.g., home and business owners) associated with each CAP measure?
- What is the budgetary impact to the local jurisdiction to implement CAP measures?

Benefit-cost analysis perspectives

A benefit-cost analysis assesses cost effectiveness and financial impacts per CAP measure. This benefit-cost analysis approach for CAPs has been adapted from the California Standard Practice Manual, which is used by the California Public Utilities Commission to evaluate the cost-effectiveness of energy efficiency programs.

PERSPECTIVES	DEFINITIONS
1. Administrator	Costs to the jurisdiction to administer and implement the CAP
2. Participant	Benefits and costs to residents and businesses to participate in a CAP measure activity
3. Non-participant	Ratepayers and taxpayers that fund rebates and incentives for participants
4. Measure	Combined benefits and costs of Perspectives 1 through 3
5. Society	Perspective 4 plus benefits/costs of impacts to public health, the economy, and the environment

FOR MORE INFORMATION ON BENEFIT-COST ANALYSES, SEE TECHNICAL APPENDIX III.

Implementation cost analysis

A CAP implementation cost analysis provides information on the budgetary impact to a local jurisdiction to implement a CAP. The process to prepare the implementation cost analysis requires identifying staffing needs and other resources to carry out the CAP measures and actions.

The data is typically collected in a way that considers existing versus new or expanded programs, funded versus unfunded costs, costs by department, costs by CAP measure, and costs over time.

FOR MORE INFORMATION ON CAP IMPLEMENTATION COST ANALYSES, SEE TECHNICAL APPENDIX IV.

CO-BENEFITS

The GHG reduction measures included in a CAP often have co-benefits, or positive external impacts, beyond GHG emissions reductions. These benefits are typically referenced throughout a CAP and highlighted using tables, figures, or icons. Co-benefits should be considered in tandem with the results of a benefit-cost analysis. Examples of potential co-benefits include, but are not limited to, those seen in Figure 4. As co-benefits are often tied to specific GHG reduction measures, metrics for co-benefits can be monitored over time and included when reporting on CAP progress.

Figure 4. CAP measure co-benefits

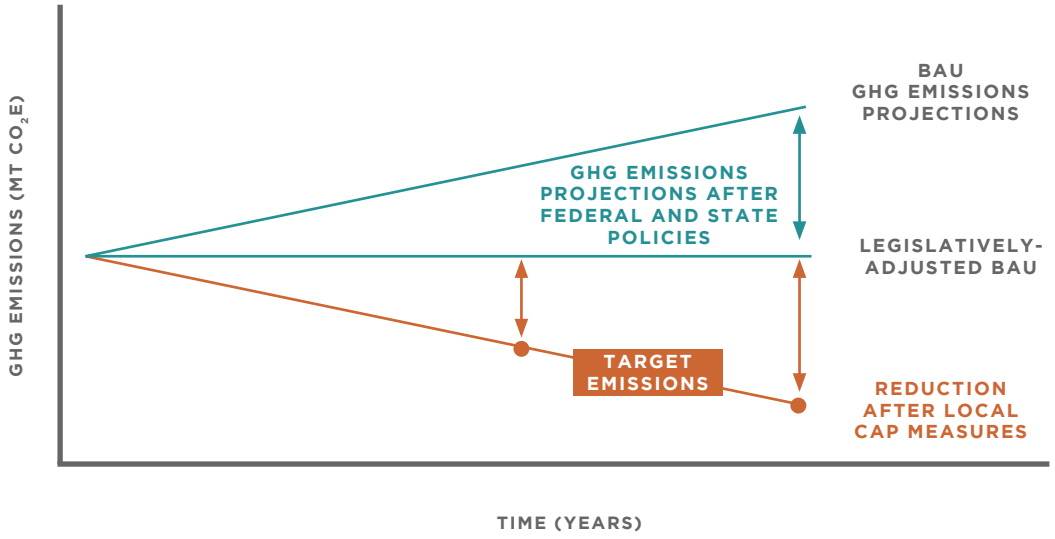
- Improved air quality
- Reduced energy use
- Increased natural habitat
- Improved public health
- Reduced traffic congestion
- Improved access to low-cost transportation options
- Enhanced safety
- Improved water quality
- Reduced heat island effects
- Enhanced community character
- Increased local green jobs
- Improved resiliency to climate impacts

FOR MORE INFORMATION ON CAP CO-BENEFITS, SEE THE CAP OUTLINE IN TECHNICAL APPENDIX V.

COMMUNICATING RESULTS

Communicating to the public and decision-makers about the relative contribution of State, federal, regional, and local strategies for meeting a CAP's reduction targets is a critical part of the local climate planning process. While there are different ways to present information about reduction measures, one commonly used graph is a wedge chart, shown in Figure 5. The wedge chart combines many of the GHG analyses of a CAP into one diagram. The wedge chart is helpful to see the relative impact of various GHG reduction measures and how each contributes toward reaching the locally-established GHG reduction target(s). The uncertainty of projecting into the future should be taken into consideration and communicated appropriately. These charts are based on the best available data at the time and should be updated during CAP reporting.

Figure 5. Sample CAP wedge chart



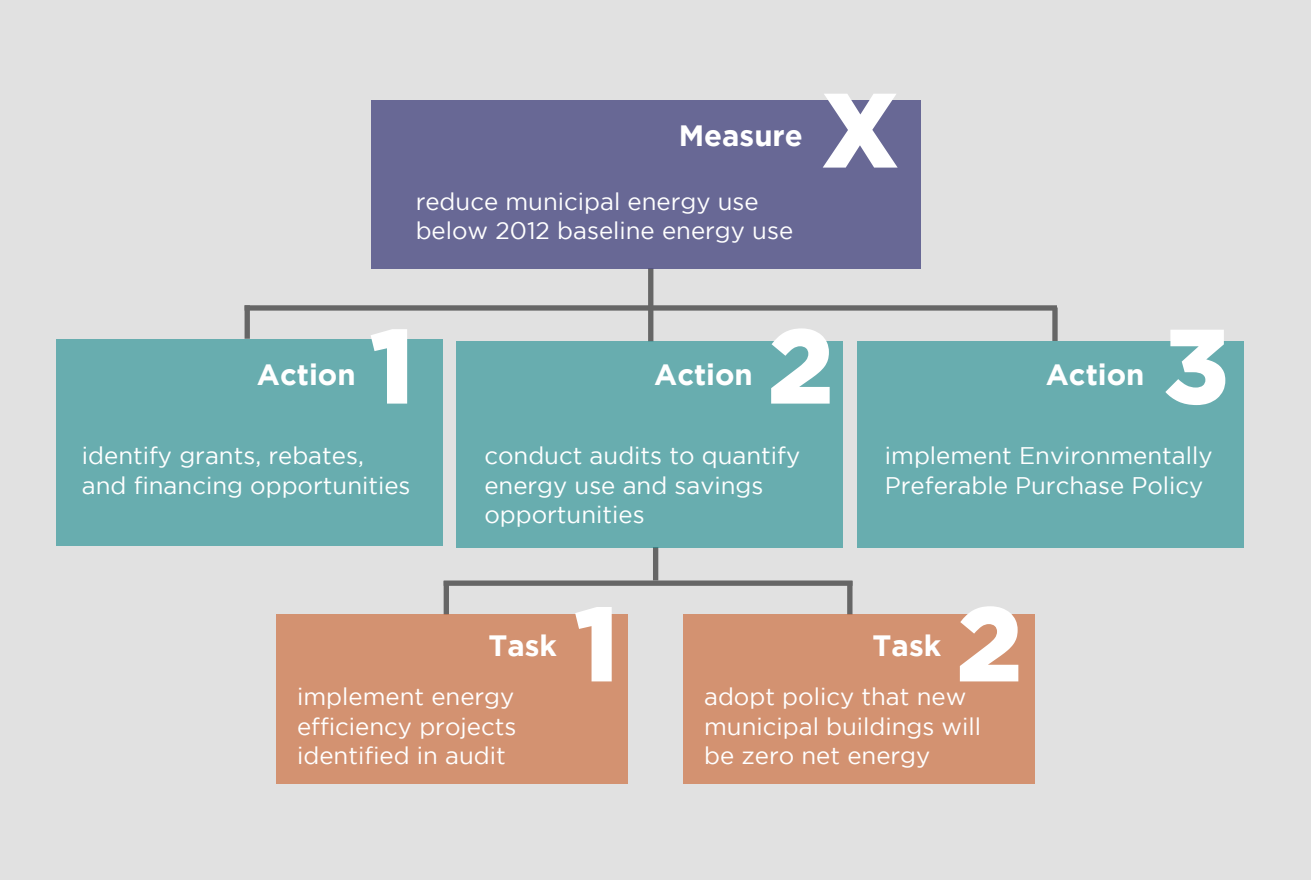
Path to 2030

The State GHG reduction target for 2030 is far more aggressive than the 2020 target. Many local jurisdictions are on track to meet 2020 GHG reduction targets, largely due to the GHG emissions reductions that come from State and federal programs. However, based on the latest information, achieving the GHG reductions to meet 2030 targets requires more local actions. Until there are new reductions from State and federal policies, local jurisdictions should expect to need more GHG reductions from local CAP measures to meet the 2030 targets and work toward 2050 goals.

IMPLEMENTATION

CAP implementation involves coordination on a wide range of activities across many agencies and departments. While implementation is considered during CAP development, many jurisdictions undertake the development of an implementation plan following CAP adoption. An implementation plan lays out the process for implementing each GHG reduction measure of the CAP, including the timeframe, staff roles and responsibilities, cost, and potential funding opportunities. Definitions for the different steps, as seen in Figure 6, are available in Technical Appendix V. An implementation plan should remain adaptive to changes in the future, such as new funding, changes in costs, advances in technology, or time-sensitive opportunities.

Figure 6. Implementation steps for a sample CAP measure



CAP implementation oversight

Based on the staffing resources described in an implementation plan, many jurisdictions have identified a position responsible for overseeing and coordinating CAP implementation. This position is typically responsible for working across departments, gathering the necessary data to update the GHG inventory and prepare monitoring reports, collaborating with other jurisdictions on implementation of best practices, and other tasks related to local climate planning.

A SAMPLE CAP IMPLEMENTATION PLAN OUTLINE IS INCLUDED IN TECHNICAL APPENDIX V.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

CEQA is constantly evolving. There are many CEQA considerations during climate action planning, including CEQA compliance for preparation of a CAP, use of "qualified" CAPs for subsequent project-level streamlining, mechanisms for streamlining, and case law.

While each CAP is unique to the jurisdiction, there are two primary types of CAPs: policy document or CEQA-qualified (also known as a "qualified CAP"). Each method approaches the details of a CAP differently. No matter the type of CAP prepared, an adopted CAP provides a jurisdiction with a list of actions to achieve the GHG reduction targets outlined within their CAP.

A SAMPLE CAP OUTLINE IS INCLUDED IN TECHNICAL APPENDIX V.

Policy document

A CAP prepared as a policy document sets GHG emissions reduction targets and establishes a range of reduction measures. A policy document CAP still contains action items and steps to achieve the reduction targets, as well as an outline of how progress will be measured. A jurisdiction with a policy document CAP typically implements measures through future actions.

Qualified CAP

A qualified CAP refers to a CAP that meets the requirements of CEQA Guidelines Section 15183.5, including certification of a CEQA document. Unlike a policy document CAP, future development projects may take advantage of CEQA streamlining provisions by demonstrating consistency with the adopted qualified CAP. This is often established with a checklist that determines consistency with the jurisdiction's land use and GHG reduction measures. A CEQA checklist can help save time, as projects are processed more quickly using the checklist, and can also reduce the number of environmental documents associated with development projects.

FOR MORE INFORMATION ON CEQA AND CLIMATE ACTION PLANNING, SEE TECHNICAL APPENDIX V.

MONITORING

Monitoring CAP implementation is a key part of the iterative climate planning process. Regular monitoring allows a jurisdiction to evaluate progress toward reaching their GHG reduction target, alter strategies or goals based on performance, and reassess future emissions projections. Early in the development of a CAP, staff should consider what data will be necessary to best monitor the CAP after it is adopted. There are several different ways to monitor CAP implementation, primarily by overall emissions and by reduction strategies, measures, and actions.

GHG inventories may not reflect the impacts of all local CAP measures. Monitoring local activity may provide a way to demonstrate progress on specific measures.

GHG INVENTORY

Monitor total emissions

Question Did overall emissions increase or decrease? Are emissions reductions on track to meet reduction targets?

Results Comparison of CAP baseline year to more recent year, visualizing reduction trends, comparison to State and local targets

Data needs Updated GHG inventory

Monitor overall emissions by category

Question Did emissions in each inventory category increase or decrease?

Results Which categories are achieving reductions faster/slower

Data needs Updated GHG inventory by category

GHG REDUCTION STRATEGIES, MEASURES, AND ACTIONS

Monitor level of activity

Question Was the target level of activities associated with the GHG reduction measure/action achieved?

Results Effectiveness of measures, changes in activity from baseline

Data needs Updated activity data (e.g., program registration/participation information)

Monitor emissions reductions

Question Were the emissions reductions associated with the level of activity achieved?

Results Effectiveness of measures, changes in activity from baseline

Data needs Data used to calculate GHG emissions reduced per measure

Monitor non-quantifiable activities

Question Did the jurisdiction complete the supporting actions it committed to in the CAP?

Results Effectiveness of CAP actions/supporting measures

Data needs List of implementation activities

FOR MORE INFORMATION ON CAP MONITORING AND REPORTING, SEE TECHNICAL APPENDIX VI.

ONGOING COLLABORATION

The region's unique geography lends itself well to collaboration; it consists of a single county, a single metropolitan planning organization (SANDAG), a single investor-owned utility (SDG&E®), and has a relatively small number of local jurisdictions, with 18 cities and the County of San Diego. ReCAP provides technical methodologies and guidance for local jurisdictions preparing and implementing CAPs in the San Diego region. The methodologies presented in the ReCAP represent the best available science at this time. As new information and data become available, the ReCAP will be updated accordingly. Efforts to reduce GHG emissions and prepare for climate impacts are not confined to local jurisdictional boundaries. Collaboration allows the San Diego region to continue its leadership in addressing climate change.

There are a number of options for local agency staff to elevate the work on their CAP efforts for recognition. Locally, the San Diego Regional Climate Collaborative leverages resources and shares expertise to facilitate climate action planning amongst public agencies, and also elevates work being done in the San Diego region to State and federal leaders. Statewide, the Beacon Program, sponsored by the Institute for Local Government and the Statewide Energy Efficiency Collaborative, honors voluntary efforts by local governments to reduce GHG emissions, save energy, and adopt policies that promote sustainability. There also are a number of climate-focused conferences throughout California that serve as platforms to share work on local CAPs.

MOVING FORWARD

Adaptation planning

The focus of climate action planning to date has been on reducing GHG emissions; however, the ongoing impacts of climate change are equally pressing issues that jurisdictions are addressing through adaptation planning. Adaptation planning addresses the vulnerabilities specific to a jurisdiction, focusing on ongoing and anticipated future climate-related impacts such as sea-level rise, increased temperature, and wildfire risk. While the primary focus of the ReCAP is on CAPs and mitigation of GHG emissions, adaptation is an important facet of comprehensive climate planning. Many jurisdictions have recognized this and are considering adaptation in their planning efforts.

California's energy & climate policy

The State of California continues to extend and update its policies around GHG reduction targets, clean energy, zero-emission vehicles, sustainable communities, and much more. The 2017 CARB Scoping Plan outlines a strategy for GHG reductions through 2030; however, the State continues to look toward the 2050 goal and identify new and/or expanded policies and programs to meet future GHG reductions. Changing policies will have an impact on CAP development, especially when calculating projections.

Advanced technology

This ReCAP was developed recognizing the importance of remaining flexible and adaptive to take advantage of new technologies, funding opportunities, and respond to community needs that allow each jurisdiction to successfully implement their CAP. Technology continues to change rapidly and can have dramatic impacts on how businesses and residents travel, use energy, and produce GHG emissions.

Some technologies that will likely have an impact on CAP development and implementation include:

- autonomous vehicles
- transition from gasoline to zero-emission vehicles
- ridesharing, such as Uber/Lyft
- battery energy storage
- renewable electricity

TECHNICAL APPENDICES PREPARED BY

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