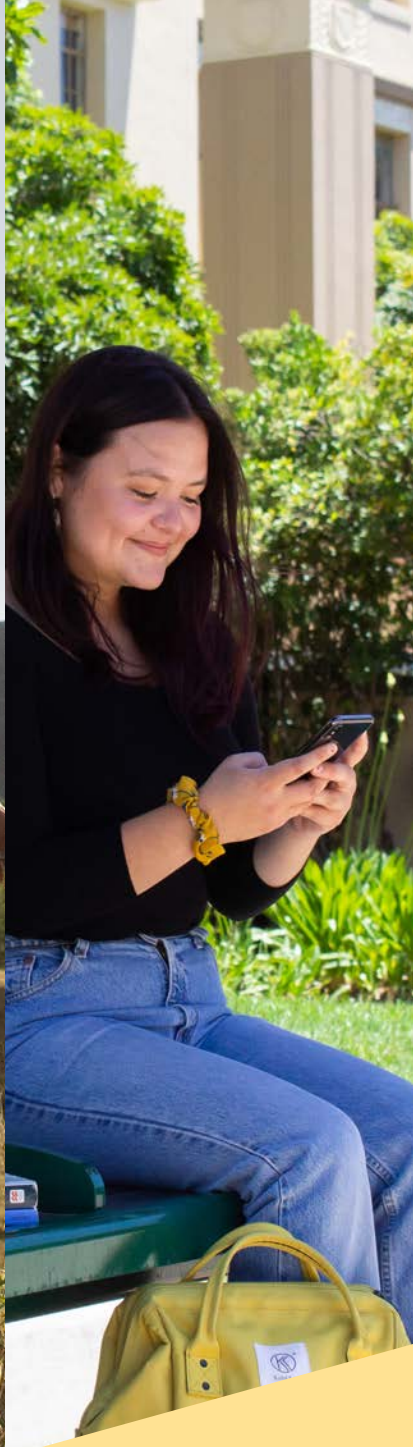




CITY OF SAN LUIS OBISPO



VOLUME 1

Stories from 2035

Climate Action Plan for
Community Recovery

slocity.org/climateactionplan



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The City of San Luis Obispo Climate Action Plan for Community Recovery includes **Volume 1: Stories from 2035**, **Volume 2: Technical Foundations and Work Program**, and technical appendices. The full plan is available at slocity.org/climateactionplan.



A Note from the City Manager

The City of San Luis Obispo is proud to present this Climate Action Plan for Community Recovery. Our community has a long tradition of environmental stewardship that continues today with overwhelming support for issues like protecting and maintaining open space and achieving ambitious climate action. This Climate Action Plan continues that tradition by setting the community on a trajectory to achieving one of the most ambitious climate targets in the nation: carbon neutrality by 2035.

We are at a pivotal and historic moment as we face the public health and economic impacts of COVID-19, come to terms with environmental injustice, and confront head-on the escalating impacts of a rapidly changing climate. While there is no cure-all for these challenges, the transformational actions presented in this Climate Action Plan, along with their focus on equity, economic opportunity, and resiliency provide the foundation for a more healthy and vibrant San Luis Obispo.

This Climate Action Plan was developed with input from over one thousand community members and years of research and technical, cutting edge work. Now it is time to undertake the hard task of implementing this ambitious Climate Action Plan. At the City, we will need to innovate and learn in ways that will push us beyond what we had previously thought possible. I am confident that our talented City staff and the engaged community that we serve are up to the challenge.

We boldly embrace this important moment and will need the Council's and Community's support to make it happen. We can do it, we have to.

Derek Johnson, City Manager

Introduction

Due to decades of rapidly increasing global greenhouse gas emissions and insufficient climate action at all levels of government and industry, atmospheric greenhouse gas concentrations have reached a level that guarantees substantial and unavoidable impacts for the foreseeable future.

In response to the need for ambitious climate action, this Climate Action Plan for Community Recovery (Climate Action Plan) establishes a communitywide goal of carbon neutrality by 2035, adopts six sector specific goals, and provides foundational actions to establish a trajectory toward carbon neutrality. The underlying assumptions and technical details that support this Climate Action Plan are provided briefly in this document and in detail in Volume 2 (available at slocity.org/climateactionplan).

Addressing climate change presents the City and community with an opportunity to use resources more effectively, improve community equity and well-being, and support an economy that is set to recover from the impacts of COVID-19 and thrive in a rapidly changing 21st century.

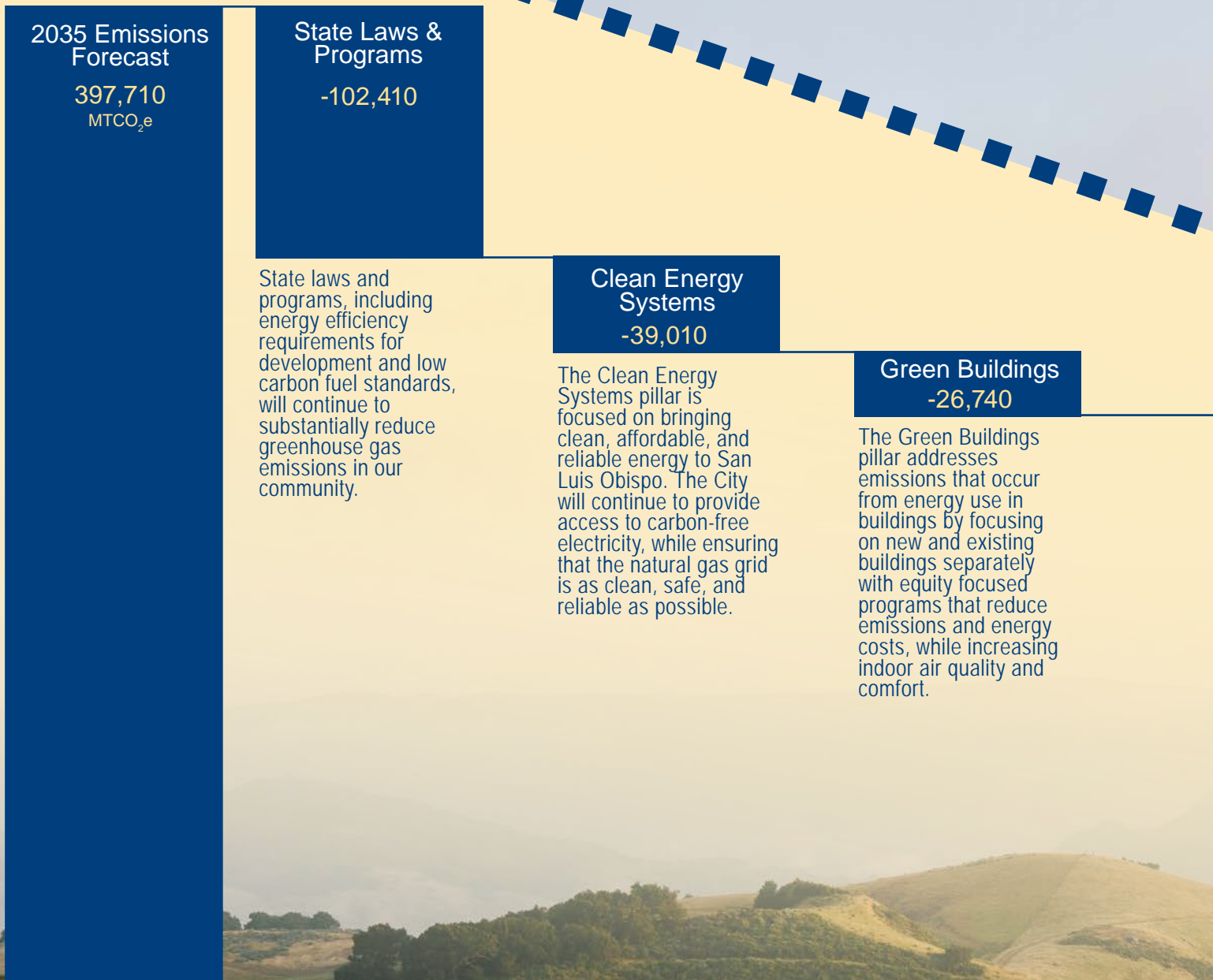
This Climate Action Plan is about addressing greenhouse gas emissions, but it is also about supporting a more equitable and resilient community. It is about creating a community that welcomes all and provides a healthy, safe, and thriving environment as it rapidly reduces its carbon footprint. It is about the ways we imagine ourselves living here over the next 15 years and beyond.

What follows is a brief overview of the City's technical approach to carbon neutrality followed by six short stories that capture moments of San Luis Obispo daily life in 2035. These stories, compiled from the nearly 90 short stories submitted by community members, show what is possible if we take the bold actions outlined in this Climate Action Plan.

What About Adaptation and Resilience?

The community has expressed considerable interest in climate adaptation and resiliency. The City is taking proactive measures to ensure community resiliency and has initiated a city-wide strategic approach to climate adaptation through the updates to the Safety Element of the General Plan, which includes a comprehensive climate change vulnerability assessment.

Path to Carbon Neutrality

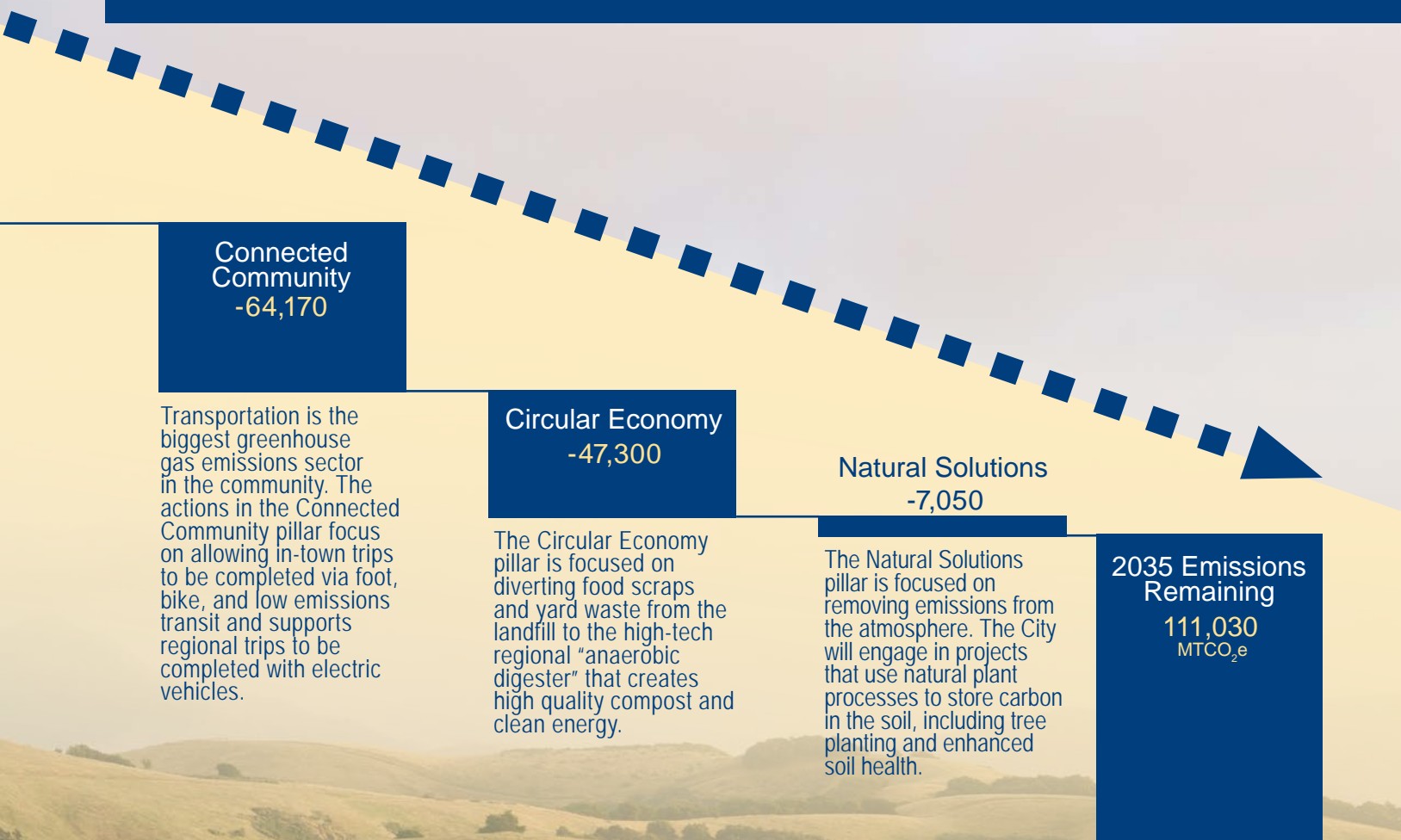


Greenhouse Gas Emissions Goals

The Climate Action Plan establishes a goal of carbon neutrality by 2035 and includes 27 foundational actions organized into six pillars. Each pillar represents a greenhouse gas emissions sector and has its own goal. The six pillars and goals are:

- 1. Lead by Example** - Carbon neutral government operations by 2030 (not included in community reductions, see Volume 2 for details)
- 2. Clean Energy Systems** - 100 percent carbon free electricity by 2020
- 3. Green Buildings** - No net new emissions from buildings' onsite energy use by 2020; 50 percent reduction in existing building onsite emissions by 2030
- 4. Connected Community** - Achieve General Plan mode split objective by 2030 and 40 percent of vehicle miles travelled by electric vehicles by 2030
- 5. Circular Economy** - 75 percent diversion of landfilled organic waste by 2025; 90 percent by 2035
- 6. Natural Solutions** - Increase carbon sequestration on the San Luis Obispo Greenbelt and Urban Forest through compost application-based carbon farming activities and tree planting; ongoing through 2035

As illustrated in the figure below, full implementation of the Climate Action Plan's foundational actions in support of achieving these goals puts the City on a trajectory towards carbon neutrality. Volume 2 provides additional information about the pillars, goals, and foundational actions.







Imagine the Future

The following stories highlight each action in the Climate Action Plan and the ways they will strengthen our community.

The “Stories from 2035” were compiled from nearly 90 short stories submitted by community members in early 2020 and reflect the culmination of a community outreach effort that interacted with dozens of organizations and businesses and over 1,000 community members.

For more information about how community input informed the Climate Action Plan, see Volume 2 at slocity.org/climateactionplan.

Now, let go of the present and imagine a future that has recovered from the impacts of COVID-19; a carbon neutral future that is cleaner, more resilient, and more equitable.

Here are some stories
from life in 2035



Morning with the Kids

It is a warm, pleasant morning.

One of those days where there is not a cloud in the sky, a day perfect for getting into the hills with the kids. With shoes tied and lunches packed, the little ones and I head out the door to grab the **free bus (1)** across town. I see it approaching and take their tiny hands in mine to catch it just in time. Even though the **electric buses (2)** have been around for a few years, I am still not used to how quiet they are. We settle into our seats and the **beautiful trees (3)** that line the road cast shadows on our laps as we pass by. My son leans across me, pushing his face against the glass. I can't help but smile to myself. When we arrive at the bus stop by our favorite trail, we see the native saplings and **tall grasses (4)** and step out into all the possibilities of a Saturday in nature.





How We Got Here

CONNECTED COMMUNITY

1

The City plans to assess the feasibility of a free-to-the-user transit ridership program. This would allow community members to utilize the City's transit system at no cost. [Learn more about Connected 4.4 on page 55 in Volume 2.](#)

2

In 2020, the City will begin implementing its Transit Electrification Strategy which details the transition to zero-emissions technologies. [Learn more about Connected 4.1 on page 51 in Volume 2.](#)

3

The City plans to develop its first Urban Forest Master Plan which will identify future tree planting opportunities throughout the City.

[Learn more about Natural Solutions 2.1 on page 70 in Volume 2.](#)

4

In 2021, the City is going to conduct a Carbon Farming Study and Pilot Project with the intent for expansion in the future. Compost applied to open spaces will result in more robust plant growth to sequester carbon from the atmosphere.

[Learn more about Natural Solutions 1.1 on page 68 in Volume 2.](#)

NATURAL SOLUTIONS

Lunch Break

My watch chimes noon:
lunch time.

It is time to take a mid-day break. I find a cool spot to eat my lunch in the shade. Five months into a new all-electric multi-use building for the City, my crew is entering the final phase of construction (1). I look up at the progress we've made and think back to the times I called the City's building support hotline (2) during the initial transition period to all-electric buildings. As a contractor that's done projects in the City for over 20 years, I've seen my industry change in endlessly exciting ways. Carbon-neutral buildings used to seem so futuristic and far-off. Now, it's nothing out of the ordinary – all municipal buildings are carbon neutral (3). Actually, most city buildings are carbon neutral (4), and even the ones that have not yet been retrofitted are the least carbon intensive (5) we have ever seen. And despite the number of wildfires each season rising, we don't have to worry about power interruptions (6). All-around, things have improved drastically and I'm proud to have been a part of that process. I can't help but wonder... what's next!?

How We Got Here

LEAD BY EXAMPLE

1

The City plans to research methods to support local contractors and labor.

Learn more about Leadership 2.2 on page 27 in Volume 2.

2

In 2021, the City plans to adopt a municipal carbon neutrality plan.

Learn more about Leadership 1.1 on page 23 in Volume 2.

ENERGY

3

In 2020, the City launched Monterey Bay Community Power and expects to achieve a 98% participation rate while advocating for programs and that support equity and achieve maximum local benefit.

Learn more about Energy 1.1 on page 30 in Volume 2.

4

The City will partner with SoCal Gas to research options for reducing greenhouse gas emissions associated with the existing natural gas grid.

Learn more about Energy 3.1 on page 33 in Volume 2.

5

The City will work with MBCP and PG&E to develop a regional grid reliability strategy.

Learn more about Energy 2.1 on page 32 in Volume 2.



Busy Afternoon

Passing through the door at 1:00 pm sharp,

the office is bustling this Monday afternoon. I barely have the chance to [dock the bike \(1\)](#) I used for lunch and set my bag down at my desk before a notification appears on my computer that contracts are ready for signature. I open the contract with a developer whose latest project is bringing two hundred [all-electric \(3\)](#) new residential units to San Luis Obispo; I sign my name on the “CEO” line. As the head of a [company that designs and manufactures \(4\)](#) residential charging devices for electric vehicles, our operations have expanded in a way I could have never imagined. Electric car ownership —along with demand for our product—continually grows each quarter as the City expands its [EV infrastructure \(2\)](#). As boxes of our product are wheeled back to the loading dock to start off today’s deliveries, I weave through the workspace - an old warehouse the team acquired in 2028 and was able to [completely retrofit \(5\)](#) a year later. I pluck a small box off the top of the stack as it moves past me and run my hands over the textured cardboard - the company, along with a few other local manufacturers, jointly committed to using all recycled packaging a few years back when we joined the [community climate collaborative \(6\)](#). Admiring the bustling workspace, I feel grateful knowing that my business and so many others can thrive in the ever-expanding green local economy.





LEAD BY EXAMPLE

How We Got Here

CONNECTED COMMUNITY

1

By 2021, the City plans to launch a micro mobility program.

Learn more about Connected 2.2 on page 48 in Volume 2.

2

The City will develop and begin implementing an electric mobility plan to achieve a goal of 40 percent electric vehicle miles traveled by 2035.

Learn more about Connected 6.1 on page 57 in Volume 2.

3

In 2020, the City will begin implementing the Clean Energy Choice Program for New Buildings.

Learn more about Buildings 1.1 on page 36 in Volume 2.

4

The City plans to develop and implement a strategic and equity-focused building retrofit program in 2021.

Learn more about Buildings 2.1 on page 38 in Volume 2.

5

The City plans to include carbon neutrality, social equity, and a focus on developing a green local economy in the updated Economic Development Strategic Plan.

Learn more about Leadership 2.1 on page 25 in Volume 2.

6

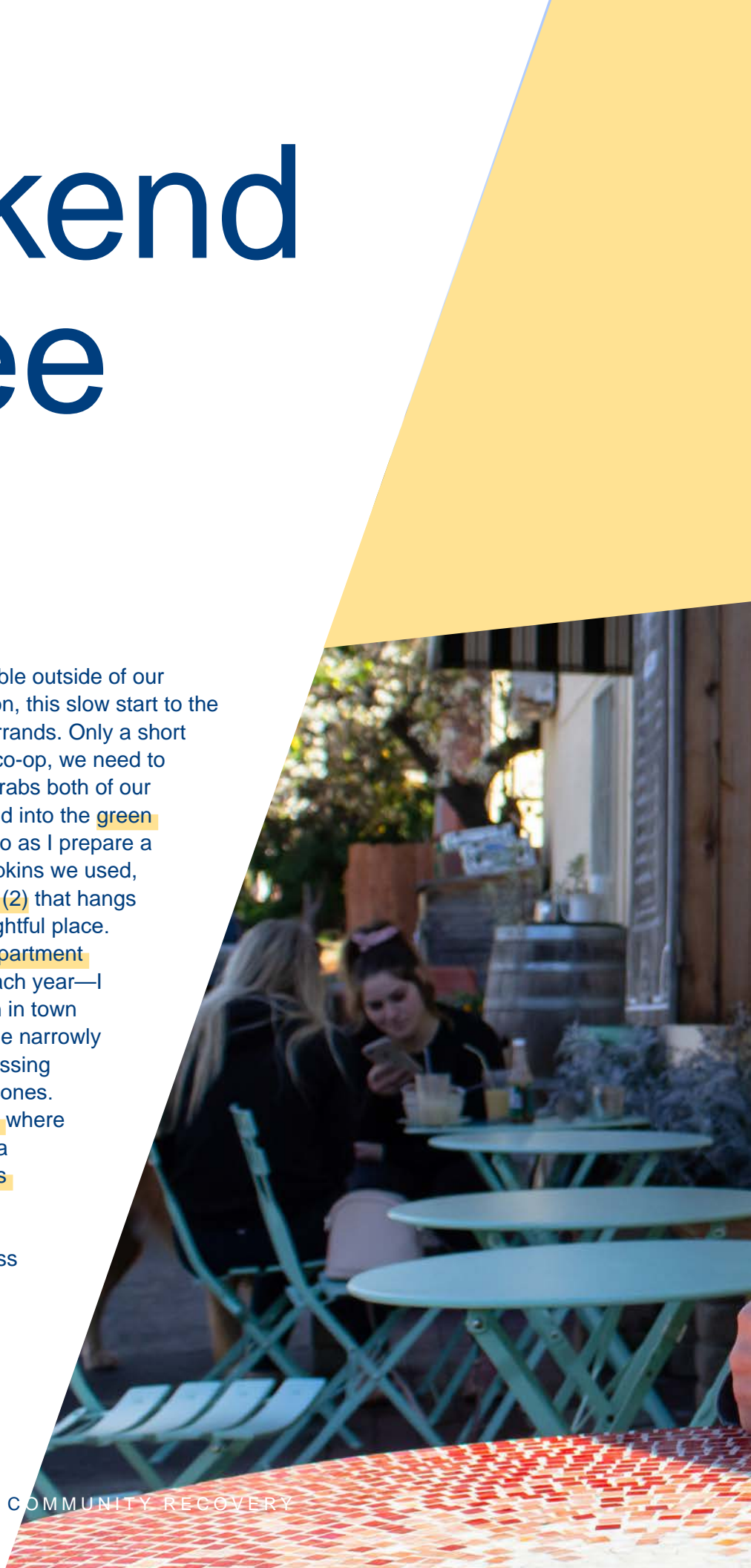
The City will continue supporting and empowering community collaboration for climate action.

Learn more about Leadership 3.1 on page 28 of Volume 2.

Weekend Coffee

First things first this brisk Sunday: coffee.

Perched next to my partner at a table outside of our favorite café, I savor each sip. Soon, this slow start to the day will give way to a long list of errands. Only a short walk away from the natural foods co-op, we need to stock up for the week ahead. He grabs both of our plates and scrapes the leftover food into the green bin (1) on the other side of the patio as I prepare a grocery list. Hesitating with the napkins we used, he consults a brightly colored sign (2) that hangs above the receptacles to find its rightful place. The new section of the Utilities Department (3) distributes updated placards each year—I don't think I have seen a waste bin in town without one! As he spins around, he narrowly avoids bumping into the barista passing by with a tray full of muffins and scones. Just beyond the fenced-in area (4) where the larger waste bins are housed, a man from the local food bank takes the leftovers (5) in exchange for a friendly greeting. I shake my head knowingly at my partner from across the patio as he laughs and shrugs his shoulders. Slinging my cotton grocery bag across my shoulder and grabbing his hand, we make our way down the sidewalk against the gentle breeze.



How We Got Here

CIRCULAR ECONOMY

1

The City plans to adopt an ordinance requiring organic waste subscription for all residential and commercial customers by 2022.

Learn more about Circular Economy 1.1 on page 61 in Volume 2.

2

The City plans to develop and implement a waste stream education program for HOA/Property Managers and the commercial sector.

Learn more about Circular Economy 1.3 on page 63 of Volume 2.

3

The City plans to develop and expand funding for a Solid Waste section in the Utilities Department in 2020.

Learn more about Circular Economy 2.2 on page 65 in Volume 2.

4

The City will update the Municipal Code solid waste section and bin enclosure standards.

Learn more about Circular Economy 2.1 on page 64 in Volume 2.

5

The City plans to develop and implement program to increase edible food rescue by 20%.

Learn more about Circular Economy 1.2 on page 62 in Volume 2.



Out and About

Peering out the window to the sky above,

examining the gray clouds and gusty winds that rattle the last leaves of the year free from their trees, I button my jacket up tightly and gather my purse. As I enter the hallway, the kids that live one door down (nearly the same age as my grandchildren) race by me as their mother apologetically waves from behind. I chuckle and begin heading down the stairs. My building consists of a dozen or so residential units above a small grocer in the [heart of downtown \(1\)](#) that were built during the affordable housing boom; I was one of the first residents to move in. Upon pushing open the door, I am greeted by a busy [pedestrian lane \(2\)](#) full of holiday shoppers. I gently bump elbows and bags as I stroll down the road towards the [parking garage \(3\)](#) surrounded by new businesses and residences. While I barely have need for my electric car living in the middle of town, it's the quickest option for getting down to the five-cities area where my son and his family live. I quicken my step as I picture my grandchildren's smiling faces - I don't want to be late for dinner!



How We Got Here

CONNECTED COMMUNITY

1

In 2020, the City will complete the 2019-21 Housing Element of the General Plan Update and Flexible Zoning Requirements for Downtown.

Learn more about Connected 5.1 on page 56 in Volume 2.

2

The City plans to complete and begin implementing the Active Transportation Plan in late 2020.

Learn more about Connected 2.1 on page 46 in Volume 2.

3

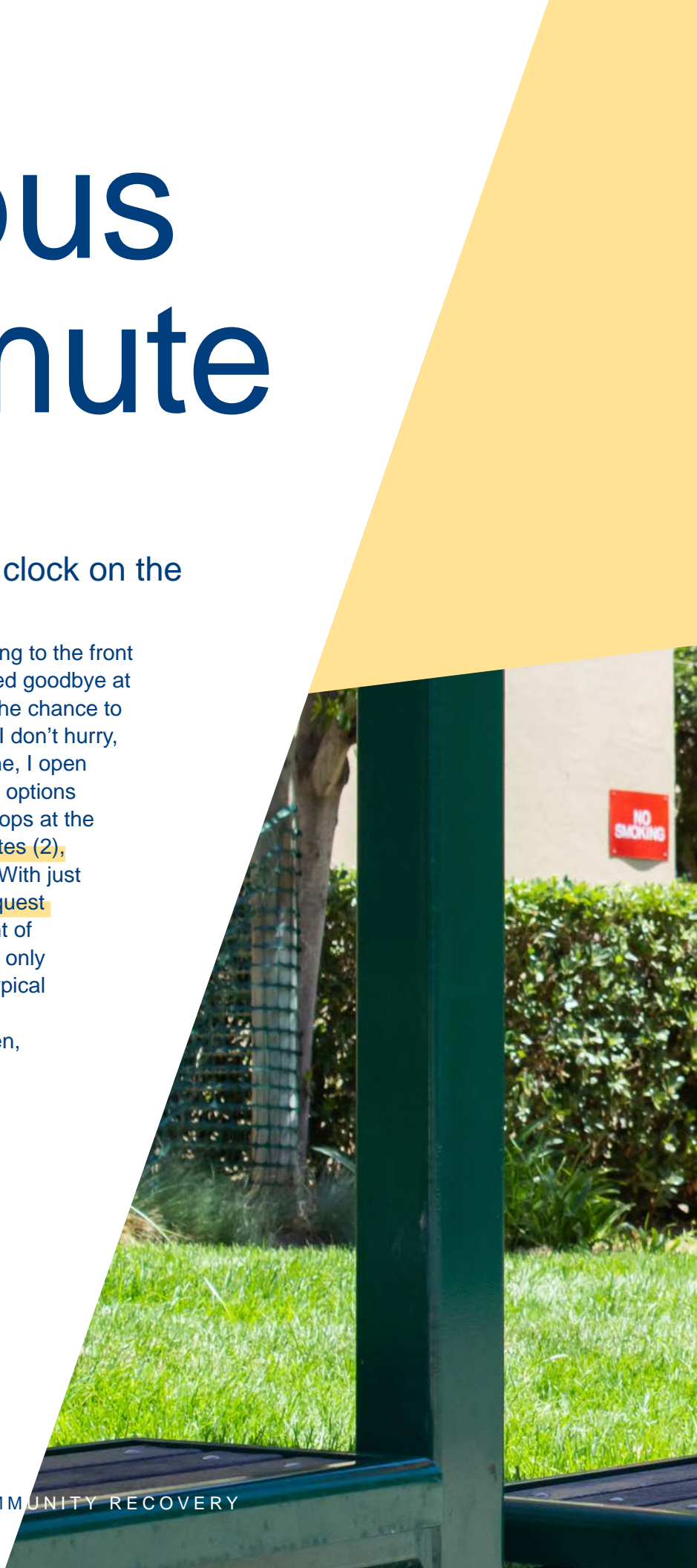
The City plans to establish an approach to take advantage of new and existing parking garages to serve residential and visitor uses.

Learn more about Connected 3.1 on page 49 in Volume 2.

Campus Commute

I glimpse up at the ticking clock on the wall

and notice I've lost track of time. Speeding to the front of the secondhand store, I shout a hurried goodbye at my manager and—before he even has the chance to respond—I'm pacing down the street. If I don't hurry, I'll be tardy to class. Pulling out my phone, I open the [SLO Mobility app \(1\)](#) and assess my options for getting to campus. Each bus route stops at the main terminal downtown [every ten minutes \(2\)](#), so I quickly pivot to head straight there. With just a few taps within the app, I'm able to [request that the bus drops me off \(3\)](#) right in front of the academic building my class is in. It's only a couple blocks away from the route's typical stop, but it will save me precious time. A bright green check appears on my screen, indicating my request was immediately accepted. A rush of relief comes over me as I round the corner to a bench next to the terminal. Stopping to catch my breath, I feel a sense of calm and security knowing how easy and accessible all the different mobility options are. Students [walk, bike, or take the bus everywhere \(4\)](#); almost no one owns a car. Instead of having to worry about how I will get around, I'm glad my biggest concern is keeping an eye on the clock.



How We Got Here

CONNECTED COMMUNITY

- 1** The City plans to develop a “Mobility as a Service” platform for people to easily use all modes of low-carbon mobility in the City beginning in 2021.
Learn more about Connected 1.2 on page 44 in Volume 2.
- 2** In 2020, the City will implement the existing Short-Range Transit Plan to shorten headways.
Learn more about Connected 4.2 on page 53 in Volume 2.
- 3** Through the 2022 Short-Range Transit Plan, the City plans to explore innovative transit options, including on-demand deviated routes.
Learn more about Connected 4.3 on page 54 in Volume 2.
- 4** In 2021, the City plans to develop consistent methods to track and report mode-split metrics of residents and community members.
Learn more about Connected 1.1 on page 43 in Volume 2.



Telling Your Story

Thank you for imagining the future with us. The vision presented here is one that highlights actions the City will take over the next several years (see Volume 2 for details about how the plan will be implemented).

However, we know that local organizations, businesses, and community members will also need to take ambitious action if the community is going to achieve its climate action goals. If you are feeling inspired to tell your own story about life in a carbon neutral San Luis Obispo, consider the prompt below and share your story with us at slocity.org/climateactionplan.

2035 Story Activity

The year is 2035. The place I live has _____.

To get home from my job, I _____.

In 2020, _____ was an issue in San Luis Obispo.

Now that has changed because _____.

In 2035, I finally get to _____,

because _____.

Acknowledgements

CITY COUNCIL

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Council Member Andy Pease
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CITY OF SAN LUIS OBISPO



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CITY OF SAN LUIS OBISPO



VOLUME 2

Technical Foundation and Work Program

Climate Action Plan for
Community Recovery

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HOW TO USE THIS PLAN

The City of San Luis Obispo Climate Action Plan for Community Recovery is intended to inform, inspire, and guide action, while also providing sufficient detail to illustrate consistency with regulatory guidance, provide transparency to interested parties, and to allow the City Council to make fully informed decisions. With two volumes and five technical appendices, the City's 2020 Climate Action Plan is over 200 pages long. To allow the plan to be more accessible, the City has organized it as follows:

- **Volume 1: Stories from 2035** – provides a summary of the Climate Action Plan through stories told from the future about a post-COVID 19 carbon neutral San Luis Obispo and the foundational actions that were undertaken to get there.
- **Volume 2: Technical Foundation and Work Program** – describes the Climate Action Plan update process, provides a greenhouse gas emissions inventory summary, and lays out the foundational actions required to achieve deep reductions in greenhouse gas emissions while addressing issues of equity and economic recovery.
- **Technical Appendices**
 - Appendix A – Greenhouse Gas Emissions Inventory and Forecast
 - Appendix B – Reduction Measure Quantification
 - Appendix C – Greenhouse Gas Emissions Threshold Guidance and Consistency Checklist for New Development

How to Use This Plan

Volume 1: Stories from 2035

Recommended for community members and local organizations that are interested in a short and engaging overview of climate action.

Volume 2: Technical Foundation and Work Program

Recommended for stakeholders and decision makers interested in the technical components and supporting details of the City's approach to climate action.

Technical Appendices

Provided for transparency and recommended for implementers, regulatory review, and anyone seeking more information.





1. INTRODUCTION

A Time for Transformational Climate Action

Due to decades of rapidly increasing global greenhouse gas (GHG) emissions and insufficient climate action at all levels of government and industry, atmospheric GHG concentrations have reached a level that guarantees substantial and unavoidable impacts for the foreseeable future.

California's recent historic wildfires, droughts, floods, mudslides, and public safety power shutoffs represent the types of climate change impacts that will be experienced with increasing frequency and severity. These impacts threaten to make all the significant issues currently faced by the City (e.g., economic recovery, the housing crisis, homelessness, equity, sustainable water supply, etc.) more critical, challenging, and expensive. To limit global warming to 1.5° Celsius, annual global emissions need to decrease 45 percent by 2030, and be "net zero" by 2050.¹

Addressing climate change presents the City and community with an opportunity to use resources more effectively, improve community equity and well-being, and develop an economy that is set to recover from the impacts of COVID-19 and thrive in a rapidly changing 21st century.

In response to the need for ambitious climate action, this Climate Action Plan establishes a communitywide goal of carbon neutrality by 2035, adopts sector specific goals, and provides foundational actions to establish a trajectory towards achieving that goal.

Climate Action and COVID-19 Recovery

The COVID-19 pandemic abruptly impacted San Luis Obispo and the surrounding region. While the community recovers from the near-term health crisis, the longer-term economic impacts are expected to remain for the foreseeable future. Climate action will play an integral role in the City's

¹ IPCC, 2018. *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways*. Retrieved from: <https://www.ipcc.ch/sr15/>

recovery from the socioeconomic impacts of COVID-19. This Plan address the near-term needs of economic and community recovery while also setting the community on a long-term trajectory towards carbon neutrality.

The City is not alone in seeing climate action as an organizing principle for community recovery. Leading economists² and governments ranging from cities³ to the European Union⁴ believe that COVID-19 recovery focused on creating a low carbon economy can provide enduring economic benefit, address issues of health and equity, and enable communities to thrive in a rapidly changing world.⁵

In addition to economic recovery, this Climate Action Plan also supports public health improvements that increase community resilience and reduce community risk from this pandemic and from future public health threats. From focusing on local economic development to increasing active transportation safety and accessibility⁶ to reducing combustion of fossil fuels to improve outdoor and indoor air quality⁷, the foundational actions in this plan provide for a cleaner, healthier, and safer San Luis Obispo.

Community Resilience

The City is currently undertaking a study to assess community vulnerability to the physical, social, and economic impacts of climate change.

Expected to be completed in 2021, the community vulnerability assessment will support the update of the City's Safety Element of the General Plan, which will establish the City's policy framework for climate change adaptation and resilience.

Guiding Principles

Since the adoption of the City's first Climate Action Plan in 2012, numerous lessons have been learned about the feasibility and effectiveness of local climate action efforts. Since the goal of carbon neutrality was first discussed by the City Council in 2018, the City has met with staff from cities and reviewed ambitious climate action plans from around the world. The lessons learned from local implementation and through review of global best practices have guided the development of this Climate Action Plan and are summarized in Figure 1.1.

² For example, see: Hepburn, C., O'Callaghan, B., Stern, N., Stiglitz, J., and Zenghelis, D. (2020), 'Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?', Smith School Working Paper 20-02. Retrieved from: <https://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-02.pdf>.

³ For example, over 30 mayors recently pledged to focusing COVID Recovery on health, equity, and sustainability. See: https://www.c40.org/press_releases/taskforce-principles

⁴ For example see: <https://www.reuters.com/article/us-health-coronavirus-eu-climate/eu-green-recovery-to-target-buildings-clean-power-hydrogen-draft-idUSKBN22W2TO> and <https://www.forbes.com/sites/davidrvetter/2020/04/13/use-lessons-of-covid-19-to-build-a-green-recovery-say-eu-ministers/#68dd906a4335>

⁵ Pinner, D., Rogers, M., and Samandari, H. 2020. *Addressing climate change in a post-pandemic world*. Retrieved from <https://www.mckinsey.com/business-functions/sustainability/our-insights/addressing-climate-change-in-a-post-pandemic-world>.

⁶ For example, Giles-Corti et al. (2010) find, "Policies promoting the use of both energy-efficient motor vehicles and increased active transportation would [...] reduce disease burden by increasing physical activity." Retrieved from: <https://pubmed.ncbi.nlm.nih.gov/20637168/>

⁷ For example, a Rocky Mountain Institute literature review report provides substantial evidence linking onsite natural gas combustion with poor indoor air quality and public health impacts. See: <https://rmi.org/insight/gas-stoves-pollution-health>

Figure 1.1 Climate Action Guiding Principles



The Climate Action Plan Process

The climate action planning process is a five-part cycle as outlined in Figure 1.2. This Climate Action Plan includes the greenhouse gas emissions inventory (summarized in this chapter and provided in full as Appendix A), establishes 2030 and 2035 greenhouse gas emissions targets, provides substantial evidence that the targets are achievable (summarized in this chapter and provided in full as Appendix B), and includes an action plan, including identified foundational actions (Chapter 3) and a staff work program (Chapter 4). The implementation of the action plan and evaluation of progress to the GHG reduction targets will occur at regular intervals following the adoption of the Climate Action Plan, as described in Chapter 4.

Figure 1.2 Climate Action Planning Process



Greenhouse Gas Emissions Inventory and Forecast

A greenhouse gas (GHG) inventory is a comprehensive measure of GHG emissions that have occurred as the result of activity in a jurisdiction or a geographic area in a calendar year. The greenhouse gas emissions inventories and related emissions forecasts are the foundation for the technical work required to complete a climate action plan. For this Climate Action Plan Update, the City updated its 2005 baseline inventory, completed a 2016 inventory, and forecast emissions for 2020, 2030, and 2035.

Table 1.1 provides the emissions for inventory and forecast years by emissions sector. Due to actions taken by the State and the City prior to the adoption of this plan, as well as observed reductions in emissions from community activity, even without this Climate Action Plan, emissions are forecast to reduce 33 percent from 2005 levels by 2035. A detailed description of accounting methods, protocols, progress towards state emissions reduction targets, and the full inventories and forecasts are provided in Appendix A.

GHG Measurement

This plan addresses three greenhouse gas emissions: carbon dioxide, methane, and nitrous oxide. Emissions are presented as metric tons of carbon dioxide equivalent, or MTCO_{2e}.

Table 1.1 Forecasted GHG emissions with state reductions, 2005-2050 (MTCO_{2e}).

Sector	2005	2016	2020	2030	2035	Percent Change (2005-2035)
Transportation	225,390	212,980	198,210	161,290	142,830	-37%
Nonresidential Energy	58,050	44,270	30,430	33,690	27,720	-47%
Residential Energy	55,450	39,410	33,760	35,660	33,180	-39%
Solid Waste	47,740	42,630	44,890	49,880	52,560	10%
Total	386,630	339,290	307,290	280,520	256,290	-33%
Change from 2005		-12%	-21%	-29%	-33%	

Emissions Reduction Targets

In September of 2018, City Council received an update on the Climate Action Plan process with a request to provide direction on a long-term GHG reduction goal. Following a presentation, public comment, and deliberation about goals that cities throughout California and the world are committing to, Council directed staff to develop a roadmap to carbon neutrality by 2035. This target goes above and beyond the 2020 target set by Assembly Bill 32 and the 2030 target in Senate Bill 32 (see sidebar).

Carbon Neutral by 2035

“Carbon neutrality” applies to the net emissions of the inventoried sectors reported in Table 1.1, above, minus emissions captured through carbon sequestration efforts. Achieving carbon neutrality in a modern advanced economy is an unprecedented challenge and will require that the City and the community implement foundational actions now and conduct additional research to assess and monitor new developments in the ongoing and evolving field of climate action planning. Achieving carbon neutrality as a community is contingent on numerous outside factors, such as increased state funding for climate action, the federal government taking responsibility for climate action and supporting local action, and a regional approach to supporting the clean energy economy. At the same time, the City’s experience has been that an ambitious reduction target invites resources for the work and puts the City in position to pursue and accept funds from external funding sources.

For regulatory guidance purposes, adoption of this Climate Action Plan Update adopts the SB 32 target for 2030 and the carbon neutrality target for 2035. Table 1.2 provides the 2030, and 2035 greenhouse gas targets presented as annual greenhouse gas emissions in MTCO_{2e}. The Climate Action Plan Update also includes six sub-targets for adoption, as described in Chapter 3.

California Climate Law

Assembly Bill 32 (AB 32) (Nuñez, Chapter 488, Statutes of 2006) established a target of reducing GHG emissions to 1990 levels by 2020 with maintained and continued reductions post 2020. Given the challenge of estimating 1990 GHG emissions, standard best practice is to use 15 percent reduction of a base line year (2005) as a proxy. The City’s previous adopted targets are consistent with AB 32. Based on participation in Monterey Bay Community Power, the City is expected to achieve its 2020 target.

Senate Bill 32 (SB 32) (Pavley, Chapter 249, Statutes of 2016) codifies into statute the GHG emissions reduction target of at least 40 percent below 1990 levels by 2030. The 2030 target reflects the same science that informs the agreement reached by the Paris Agreement aimed at keeping the global temperature increase below 2 degrees Celsius (C).

In 2019, California Governor Jerry Brown issued Executive Order B-55-18, which establishes a new statewide goal to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve net negative emissions thereafter.

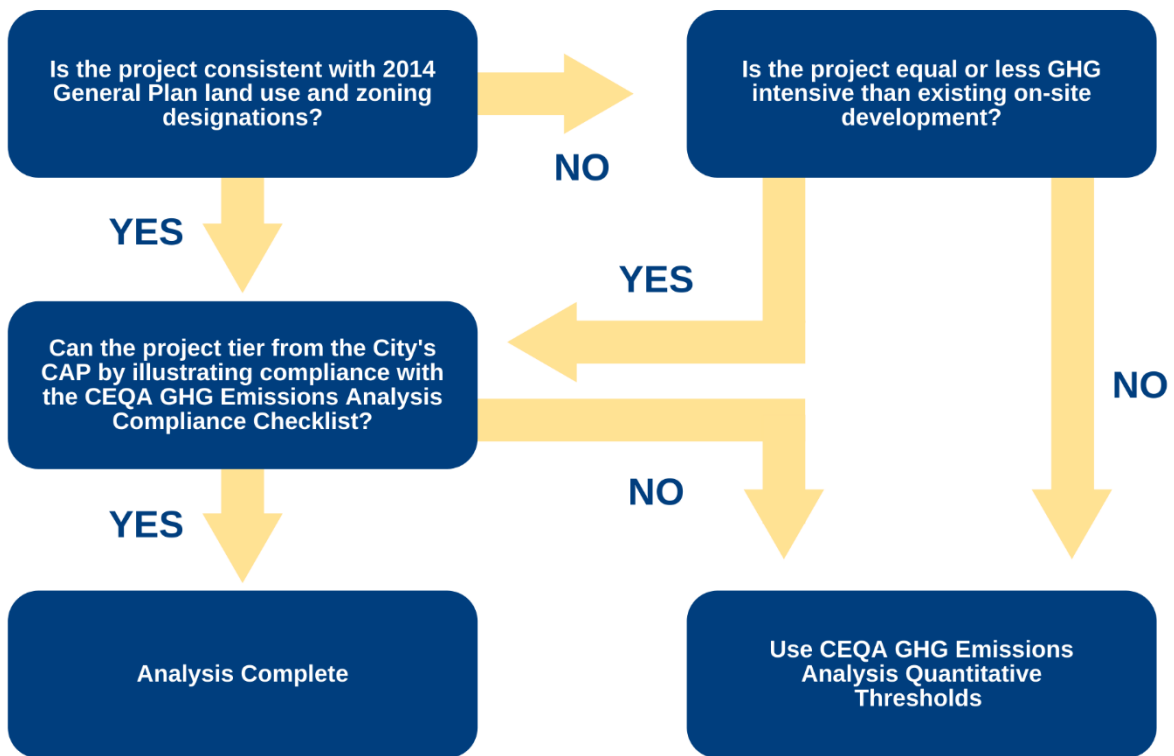
Table 1.2 Greenhouse Gas Emissions Target Summary

Target	Annual GHG Emissions Target (MTCO _{2e})
2005 Baseline Emissions	386,630
AB32 – 1990 levels (15% below baseline) by 2020	328,640
SB 32 – 40% below 1990 levels by 2030	197,180
Carbon Neutral by 2035	0

New Development Consistency with the Climate Action Plan

California Environmental Quality Act (CEQA) Guidelines Section 15183.5(b)(1) establishes criteria to guide the preparation of a “plan for the reduction of greenhouse gas emissions.” A City can make findings that its plan is consistent with these guidelines and can use the CEQA document for the Climate Action Plan to allow future environmental review streamlining. This Climate Action Plan has undergone CEQA review and the City finds that it is a qualified greenhouse gas emissions reduction strategy consistent with state law. As illustrated in Figure 1.3, development that triggers CEQA review may use the CEQA GHG Emissions Analysis Compliance Checklist provided in Appendix C to illustrate consistency with this Climate Action Plan and will not be required to conduct additional greenhouse gas emissions review. Should a project be unable to comply with the checklist, it would be required to illustrate compliance with the City’s project efficiency threshold, also provided in Appendix C. A project that can illustrate compliance with the checklist or achievement of the City’s efficiency thresholds will be consistent with the Climate Action Plan and will not require further greenhouse gas emissions review.

Figure 1.3. New Development Consistency with the Climate Action Plan





2. COMMUNITY OUTREACH

A Community Driven Process

San Luis Obispo residents and businesses routinely rank climate change as an important issue. In 2019, thousands of people in San Luis Obispo contributed to the City's budget process that resulted in City Council adopting Climate Action as a Major City Goal for the second straight Financial Plan cycle. Public input, community engagement, and local capacity building are essential components of this Climate Action Plan. Dozens of outreach events and engagement with thousands of community members support this Climate Action Plan Update. The events and activities were designed to empower a variety of residents, stakeholders, City staff, and decision-makers throughout the process to craft the Climate Action Plan Update and to be ready to implement it after adoption. This chapter provides outreach objectives and an overview of the events conducted to collect information and develop this Climate Action plan.

Outreach Objectives

The City established specific outreach goals and objectives to ensure that the Climate Action Plan is reflective of the values of San Luis Obispo. The City began the planning process with the following objectives (and achieved each of them):

- Provide an open and transparent process
- Educate the community about the importance and urgency of climate action
- Engage and empower a broad cross-section of San Luis Obispo residents, business owners, students, stakeholders, and decision-makers to take meaningful climate action within their own roles in the community
- Gather input at strategic points in the planning process to inform the Climate Action Plan
- Gather meaningful input and feedback from the community about the Climate Action Plan
- Achieve broad demographic and geographic representation from stakeholders including participants who are typically not engaged and traditionally under-represented in planning processes.
- Engage at least 1,000 community members.

Outreach Events

The City, in partnership with community organizations, held dozens of events that ranged from traditional City Council meetings, to “pop up” events, to on-line information gathering tools. This section outlines the events conducted in support of this Climate Action Plan.

City Council Meetings

Staff presented information regarding the Climate Action Plan, collected feedback from community members through public comment, and received direction from City Council at three public meetings.

2018 Study Session - On September 18, 2018, Staff presented to Council on the status of the Climate Action Plan Update, the results of the Community Greenhouse Gas Emissions Inventory, and emissions reduction target options. Council directed staff to pursue carbon neutrality by 2035; a greenhouse gas reduction measure more aggressive than that outlined in SB 32. This Study Session laid the foundation for the 2020 Climate Action Plan Update.

2019-21 Strategic Budget Community Meeting and Public Hearing - As part of the 2019-21 Financial Plan development, the City hosted a community meeting and public hearing on April 16, 2019. Through the process, staff received climate action feedback and ideas from hundreds of residents. This event included 300 in-person participants.

2019 Study Session - On December 3, 2019, Staff presented to Council the proposed approach to the Climate Action Plan. City Staff proposed the approach to carbon neutrality outlined in Chapter 3 and received unanimous support to continue with the proposed approach.

Climate Solution Speaker Series

At the beginning of the Climate Action Plan Update process, the City considered ways for outreach to be accessible, different, and fun. The City conceived of public educational events with regional and national experts available to provide information and answer questions. Named, “Climate Solutions Speaker Series”, the City partnered with the SLO Climate Coalition to host several educational events related to climate action.



Climate Solution Speaker Series I - The kickoff event on April 30, 2019 was a celebration of San Luis Obispo’s decision to pursue a goal of carbon neutrality by 2035. The event featured booths from local organizations including ECOSLO, Monterey Bay Community Power, the Sierra Club, and SLO Transit, as well as panel discussion with Mayor Harmon and representatives from the SLO Chamber of Commerce and California Polytechnic State University. The kickoff event had 250 attendees.

Climate Solution Speaker Series II – On June 25, 2019, the second speaker series event included a presentation by Hal Harvey—CEO of Energy Innovation, a San Francisco-based energy and environmental policy firm—discussing the effectiveness and benefits of potential policies as climate solutions. The presentation was followed by a forum where leaders from community organizations representing environmental justice, racial justice, and equity concerns shared their climate policy-priorities. The event had 110 participants.



Climate Solution Speaker Series III - This two-part event on August 22, 2019 included a panel discussion on building decarbonization and a Building Expo at the Thursday Farmers' Market featuring appliances, technologies, and materials in support of building decarbonization. The panel discussion was attended by 85 participants; the expo was attended by hundreds of Farmers' Market attendees.

Community Workshops and Open Houses

The City held workshops and open house events in central locations and organized them to inform the community about the Climate Action Plan, collect feedback, provide opportunities to answer questions about the Climate Action Plan, and share the proposed approach to carbon neutrality.



Workshop #1 - On May 16, 2019, the City hosted the first Climate Action Plan workshop. The event consisted of an overview presentation and workshop inviting participants to share their “big ideas” for achieving carbon neutrality. The workshop guided participants through each of the pillars to the Climate Action Plan and provided opportunity for comments on each. Key takeaways from each board ranged from “Establish parking maximums” to “Update City tree list to focus on native species.” The workshop culminated with a community open mic where participants shared stories, thoughts, ideas and actions related to climate change in 30 seconds or less. This workshop had 35 participants.



California Polytechnic State University Workshop - On October 8, 2019, the City hosted an interactive workshop on the California Polytechnic State University campus. The workshop consisted of an overview presentation and workshop inviting students and faculty to share their “big ideas” for achieving carbon neutrality. This workshop had 20 participants.



Open House - On December 3, 2019, the City hosted an Open House for the public to learn more about the Climate Action Plan Update. The Open House showcased the six proposed

pillars for the Climate Action Plan and concluded with a “visioning” activity. This event had 70 participants.

Community Meetings

The City hosted several community meetings to discuss specific focus areas related to the Climate Action Plan, such as building decarbonization and how local organizations can take leadership in climate action.

Business Roundtable - On May 16, 2019, City Staff invited members of the business community to share initial ideas for how they can take ownership of business-related climate action initiatives. The meeting had 25 participants.

Community Collaboration for Climate Action Meeting - On January 15, 2020, the City hosted a meeting for members of local non-profits, government organizations, businesses, and community service groups to connect and collaborate for climate action. The event consisted of an overview presentation of the City’s Climate Action Plan and a breakout session of small groups to brainstorm and discuss actions their organizations can take. This meeting elicited 23 participants.

Tabling

City staff travelled to several locations throughout the city to allow community members the opportunity to engage with the Climate Action Plan in a convenient and streamlined manner.



Farmers' Market Booths - On October 10 and November 7, 2019, City Staff tabled at the Downtown Farmers' Market to update the public on the Climate Action Plan and provide opportunity for questions and comments. Staff engaged participants in interactive activities to facilitate learning about the Climate Action Plan. Staff also invited participants to share their "big ideas" for climate action at home, in their neighborhoods, at work, and city-wide. Each event engaged approximately 20 participants.

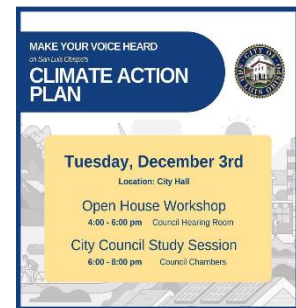
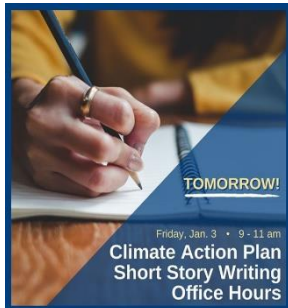


Short Story Collection - In January 2020, City Staff tabled at California Fresh (771 Foothill Blvd.), Assistance League (667 Marsh St.) and Nautical Bean (2010 Parker St.) to share information about the Climate Action Plan Update and encourage community members to submit a "short story" about their vision of carbon neutral San Luis Obispo in 2035. These stories were used as inspiration for the stories shared in Volume 1 of the Climate Action Plan. These events engaged 90 participants.

Online Outreach

Staff provided online opportunities for community members to learn about and contribute to the development of the Climate Action Plan through various online platforms.

Social Media – The City used its social media channels to provide information about outreach events, opportunities to provide feedback to drafts, and general education.



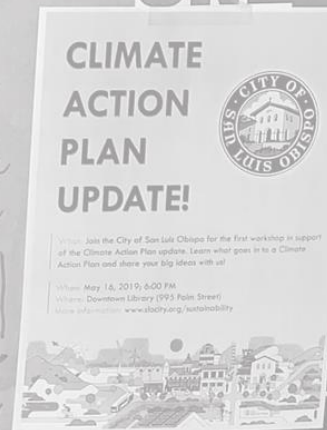
2019-21 Budget Open City Hall - Participants were shown current "Major City Goals and Other Important Objectives" and asked to choose the top 5 they think the City should prioritize. Climate Action ranked #4 out of 14. This event was released in January 2019 and had 1,587 participants.

Emissions Reductions "Big Ideas" Open City Hall - Participants were invited to share their "big ideas" for reducing greenhouse gas emissions in the City. Responses ranged from "Re-roof homes in white" to "Turn off non-commercial streetlights between 1:30-5:30 a.m." This online activity was released in concurrence with Workshop #1 in May 2019 and had 71 participants.

Conclusion

As discussed in Chapter 3 and Chapter 4, the path to carbon neutrality is one that involves continued learning, reflection, and innovation. As the City implements this Climate Action Plan and works on future updates, this spirit of learning, reflection, and innovation will be carried to the community outreach process where new voices and new ideas will be heard.

3. THE PATH TO CARBON NEUTRALITY



The City’s Approach to Carbon Neutrality

The City’s approach to carbon neutrality is based on the guiding principles and greenhouse gas emissions inventories and forecasts described in Chapter 1, and the conversations that occurred with the community described in Chapter 2. The City’s approach to carbon neutrality is organized into the six pillars, as shown in Figure 3.1, each with a long-term goal and foundational actions to be initiated or completed by 2023.

Estimated Greenhouse Gas Emissions Reductions

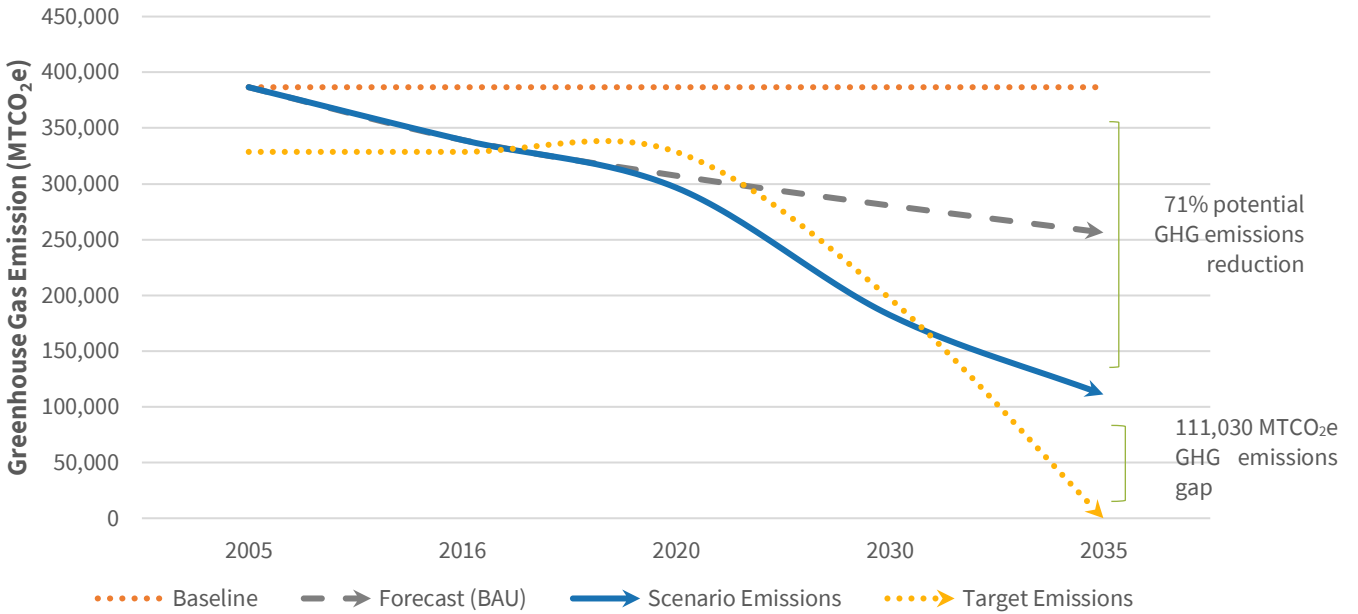
In partnership with technical consultants, the City identified a pathway to achieve quantified GHG reductions consistent with state regulation and local policy. The resulting GHG reductions estimates and underlying calculations show substantial evidence that the City can achieve consistency with SB32’s target of 40 percent below 1990 by 2030, and that the foundational actions in this Climate Action Plan create the conditions to make significant progress toward achieving its carbon neutral by 2035 goal.

The combined local reductions from the Climate Action Plan pillars and their foundational actions could result in an annual reduction of 124,270 MTCO_{2e} in 2030 and 184,270 MTCO_{2e} in 2035, as shown in Table 1.1. This represents a total reduction in annual greenhouse gas emissions of 204,330 MTCO_{2e} in 2030, or 53 percent from the 2005 baseline, and 275,600 MTCO_{2e} in 2035, or 71 percent from the 2005 baseline with a remaining gap of 111,030 MTCO_{2e}.

Figure 3.1 Six Pillars to Carbon Neutrality



Figure 3.2 Projected Community GHG Emissions, 2005-2035



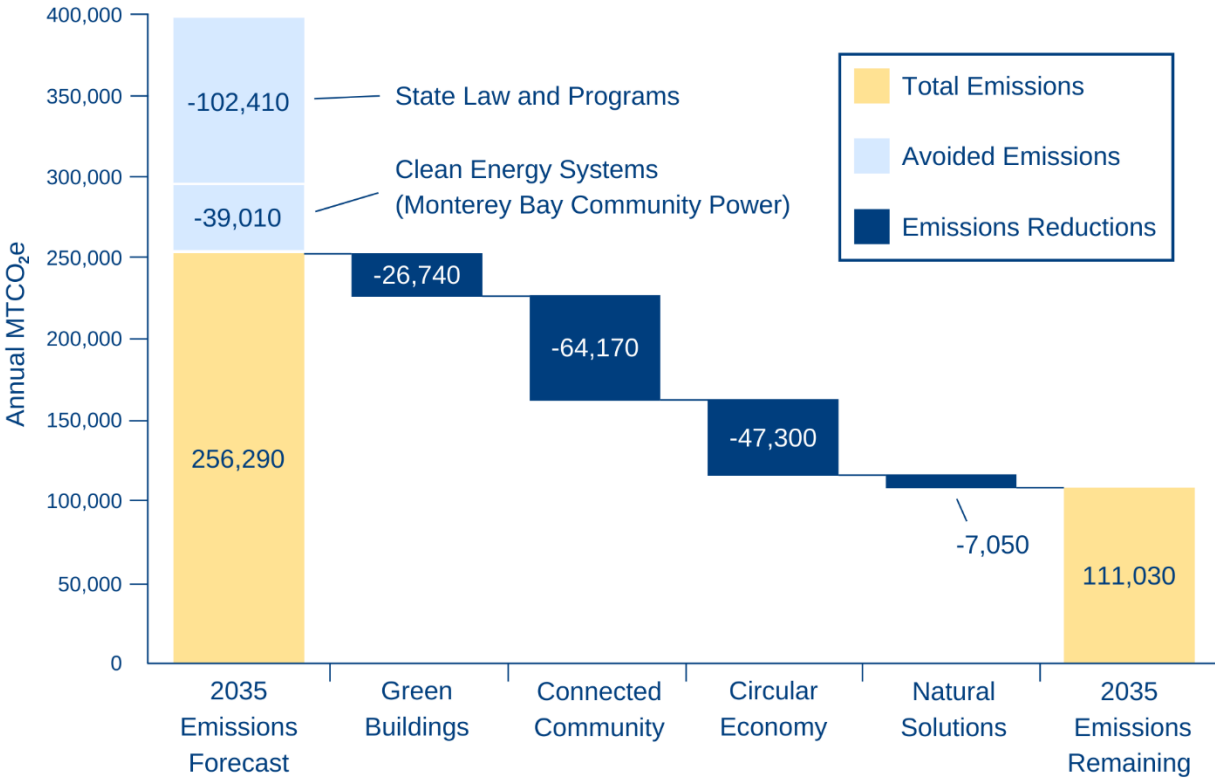
*The quantified reduction estimates for the “Lead By Example” pillar will be included in the forthcoming municipal climate action plan and are not counted in this community climate action plan.

Taken together, these six pillars could reduce community greenhouse gas emissions by approximately 71 percent below annual baseline emissions by 2035, with the largest reductions occurring in the Connected Community and Circular Economy pillars. Table 3.1 and Figure 3.3 provide overviews of greenhouse gas emissions reductions by pillar.

Table 3.1 GHG Emissions Reductions Estimates (MTCO₂e, 2030 and 2035)

Pillar	2030	2035
Pillar 1: Lead by Example	*	*
Pillar 2: Clean Energy Systems	26,050	39,010
Pillar 3: Green Buildings	11,960	26,740
Pillar 4: Connected Community	45,240	64,170
Pillar 5: Circular Economy	37,410	47,300
Pillar 6: Natural Solutions	3,610	7,050
Total	124,270	184,270

Figure 3.3. Greenhouse Gas Emissions Reductions by Decarbonization Pillar
(Annual MTCO₂e in 2035)



Note: The Clean Energy Systems pillar action (launch Monterey Bay Community Power service) is expected to be significantly underway at the adoption of the Climate Action Plan, and therefore is included in the GHG inventory forecast. For this reason, it is illustrated in Figure 1.1 as emissions avoided in the forecast.

Getting to True Carbon Neutrality

The approach to reducing greenhouse gas emissions provided in this Climate Action Plan would leave approximately 111,030 MTCO₂e in annual emissions in 2035 to reduce or offset to achieve true carbon neutrality. Chapter 4 provides additional administrative actions that the City commits to for the purpose of continuing the learning process and to better understand how to address the remaining emissions.

The methods used to quantify these reductions are provided in detail as Appendix B, and they demonstrate one of several viable paths enabled by the foundational actions in this Climate Action Plan. As these foundational actions are initiated and transition from pilots to fully implemented programs operating at the appropriate speed and scale, the specifics may vary, which is why a monitoring and reporting program is also provided in Chapter 4.

It is important to note that although the analysis does not demonstrate that San Luis Obispo is able to achieve carbon neutrality by 2035, the total emissions reductions that can be achieved across the six pillars that are within the City’s authority or influence shows the massive potential

for the City to reduce local greenhouse gas emissions, while recovering from the economic impacts of COVID 19 and creating a healthier, cleaner, and more connected community.

Having a carbon neutrality framework in place will allow the City to capitalize on private foundation investments and federal and state funding sources as they become available. Additionally, the gap in GHG reductions illustrates that if true carbon neutrality is to be achieved, substantial support from the federal government and the State of California is required.

Foundational Actions

The six pillars in this Climate Action Plan include specific foundational actions to be initiated or completed by 2023. Each of these actions present critical first steps in pursuing community-wide carbon neutrality by 2035. The Office of Sustainability has worked closely with departmental staff throughout the City, the community, key stakeholders, technical consultants, and other cities to develop and refine each of the following actions to ensure consistency with Council objectives, feasibility, and equitable community impacts and benefits.

Many of the actions can be completed with existing staff time and budgeted resources. However, many other actions will require future funding allocations or obtaining grant resources. Given the financial impacts of COVID 19, there is less certainty about available resources and as a result, staff will pursue additional grant funding opportunities.⁸

The remainder of this chapter provides an overview of each pillar and a detailed description of each foundational action, including the following points of information (note that the pillar sections are color coded for ease of reading):

- Detailed action description
- Responsible department
- Timeline
- Funding and financing options
- Equity considerations
- Economic development considerations
- Case studies

State Guidance and Research

State legislation (AB 32 and SB 32) focused on reducing GHG emissions provides authority to the California Air Resources Board to develop the strategy for achieving the state's targets via the Climate Change Scoping Plan (Scoping Plan). The Scoping Plan identifies the need for local governments to reduce their emissions accordingly and provides an approach to achieve the 2030 targets and to put the state on a trajectory to achieve the goal of reducing emissions 80 percent under 1990 levels by 2050.

Faced with the incredibly challenging, but essential, task of achieving these deep reductions in greenhouse gas emissions, the State of California has commissioned numerous studies outlining potential decarbonization paths. For example, the California Energy Commission (CEC) released the report *Deep Decarbonization in a High Renewables Future (2018)* to describe the most cost-effective approach to reaching the state's 2030 and 2050 targets. The City has used this organizational framework as a foundation and has amended it based on additional research to establish the six pillars of decarbonization in this Climate Action Plan.

⁸ The City partnered with the Urban Sustainability Director's Network to develop a comprehensive funding and financing map that identifies the various ways climate action measures can be paid for. This financing map informed the vetting of actions included in this plan.

PILLAR 1: LEAD BY EXAMPLE

Like many organizations, the City owns vehicles, operates buildings, and has employees that commute to work. Municipal operations contribute greenhouse gas emissions by using electricity and natural gas and fossil fueled vehicles for its fleet and commuting employees, as well as generating solid waste. Accelerating and expanding the City's traditional approach to the wise use of resources and organizational resilience will simultaneously reduce greenhouse gas emissions and serve as an example to residents and businesses in the community that organizational carbon neutrality is possible. The City also plays a key role in economic development and support of community partnerships. By centering climate action in these efforts, the city can support local and regional organizations in achieving their own climate action goals while also developing the economy to thrive in a rapidly changing world.

Lead by Example Goals:

Carbon neutral government operations by 2030; Municipal Action Plan by July 2021

Total Emissions Reductions in 2030:
Not quantified

Total Emissions Reductions in 2035:
7,500 MTCO₂e

City Leadership

The City is already a municipal leader in sustainability initiatives and is currently working on, or is planning to work on, the following projects:

- Implementing the Water Treatment Plant Energy Efficiency project
- Ongoing evaluation of recycled water system expansion
- Evaluation of onsite energy generation at the Water Resource Recovery Facility, including feasibility of a fuel cell powered microgrid.
- Lighting energy efficiency projects at the City's parking garages
- Electric vehicle chargers for fleet vehicles at the Palm Street Garage
- Electric vehicle chargers at City Hall
- Developing Purchase Power Agreement (PPA) for solar projects

Foundational Actions

The foundational actions in this pillar are summarized here and described in detail below:

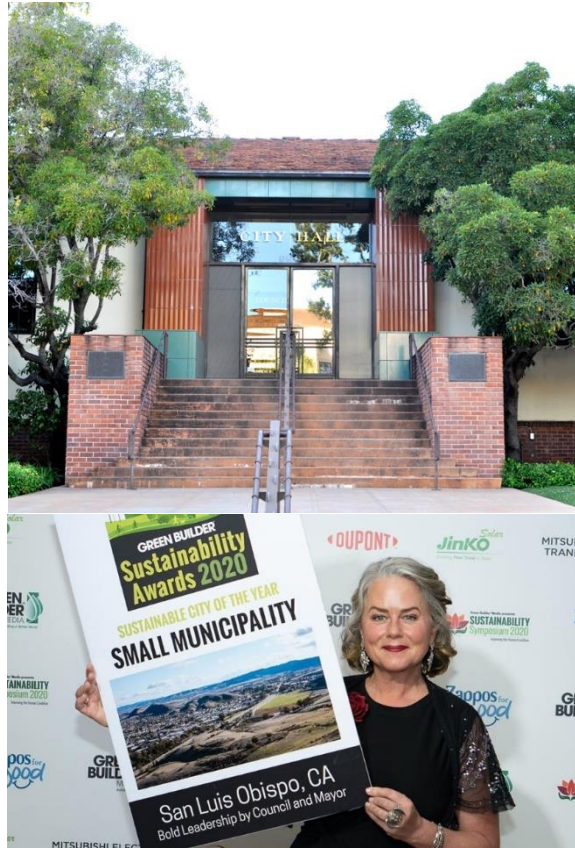
- Leadership 1.1 – Adopt a municipal carbon neutrality plan in 2021.
- Leadership 2.1 – Include carbon neutrality, social equity, and a focus on developing a green local economy in the updated Economic Development Strategic Plan.
- Leadership 2.2 – Research methods to support local contractors and labor.
- Leadership 3.1 – Create a formal approach to support and empower community collaboration for climate action.

Leadership 1.1 Adopt a municipal carbon neutrality plan in 2021.

The City will develop and complete a plan to achieve carbon neutral municipal operations by 2030. The plan will build on already completed work to inventory municipal greenhouse gas emissions and ongoing and concurrent work to reduce operational greenhouse gas emissions.

City facilities include water treatment and wastewater treatment plants, office buildings, parking garages, the maintenance yard, and transit operations, among others. A municipal carbon neutrality plan, including the following components, would establish a technical and financial approach to reduce organizational emissions to net neutral by 2030. As a highly visible organization in the community, the City would illustrate the viability of low carbon operations and would be able to share lessons learned and resources with other local and regional organizations.

- Develop a ten-year work program through staff collaboration to achieve carbon neutrality, including:
 - Detailed action descriptions
 - Order of magnitude costs and cash flow assessments
 - An overall loading and phasing approach, including a description of how the proposed actions are synched with the biennial financial planning process and the capital improvement program
 - Responsible department and explanation of how the action integrates with in-process or planned City projects
 - For particularly innovative, complicated, or collaborative actions, advice on procuring appropriate technical and project implementation partners
- Review of City administrative practices and organizational policies, and development of recommendations to integrate and prioritize climate decision making
- Development of necessary policy statements via resolution for consideration by City Council including, but not limited to, commitments to not procure or construct assets that consume fossil fuels



Responsible Department

Administration will manage the administrative components of the project; Public Works and Utilities will be responsible for supporting the plan development and proposing, vetting, finalizing, and implementing the actions in the plan.

Timeline

The Municipal Climate Action Plan will be initiated in Fiscal Year 2019-20 and will conclude in July 2021. Implementation of the plan will occur through 2030.

GHG Reduction Estimates

Carbon neutral municipal operations would equate to approximately 7,500 MTCO₂e per year in 2035. It is important to note that these emissions are a subset of community emissions and the reductions from this pillar are not included in the community total to ensure the reductions are not double counted.

Funding and Financing Options

The plan is currently funded through an existing encumbered carryover funding amount of \$45,000. However, this funding has been put on hold as the City assesses COVID 19 budget impacts. City staff has identified a way to complete the plan using staff resources only.

Equity Considerations

The City provides equal access to facilities, transit, transportation, recreation, water, and wastewater, among many other services. It will be critical that pursuit of carbon neutrality in government operations will not affect access to services for low income households and individuals.

Economic Development Considerations:

The development of the City's organizational approach to carbon neutrality can be used by local and regional organizations and businesses. As a living laboratory for clean innovation, the City's operational initiatives align closely with the economic development initiatives outlined in Leadership 2.1, below.

Case Studies

- [City of Ft. Collins, CO, Municipal Operations Sustainability Plan](#)
- [City of Austin, TX, Carbon Neutral Operations Resolution](#)
- [City of Lancaster, PA, Municipal Operations Decarbonization Plan](#)

Tracking Progress

The City will report on plan development progress until adoption and will report on implementation progress thereafter.



Leadership 2.1 Include carbon neutrality, social equity, and a focus on developing a green local economy in the updated Economic Development Strategic Plan.

Adopted in 2012 and updated in 2015, the City's Economic Development Strategic Plan provides a framework for economic growth. The Economic Development Strategic Plan includes strategies to break down barriers to job creation, actively support knowledge and innovation, promote and enhance the San Luis Obispo quality of life, and build on existing efforts and strengthen regional partnerships.

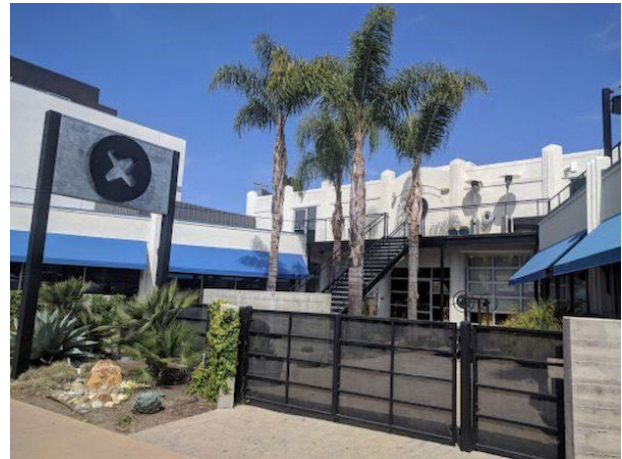
Since 2015, awareness of the need to achieve ambitious greenhouse gas emissions reductions has coincided with findings that the transition to a low carbon economy is itself an economic development and wealth generating opportunity. At the same time, Council has affirmed that these growth opportunities must benefit all of the community and should include a focus on providing opportunity for low income or historically underrepresented communities.

The region is facing changes, including the closure of Diablo Power Plant, the introduction of Monterey Bay Community Power, and recovery from the COVID-19 pandemic and has several overlapping regional economic development projects ongoing, including REACH (formerly Hourglass) and the regional Housing Action Team. Barriers to the development of a low carbon and equitable model of economic growth continue to persist, including cost of housing, adequate infrastructure, and access to investment capital. The updated Economic Development Strategic Plan will focus on supporting efforts that lower these barriers and will develop a program that leads to low carbon equitable growth for a thriving community and region.

Responsible Department - Administration

Timeline

The Economic Development Strategic Plan will be initiated in 2020 with a planned completion of 2022 and implementation thereafter.



GHG Reduction Estimates

The strategic approach to developing a low carbon economy is supportive of the carbon neutrality goal but does not itself reduce greenhouse gas emissions.

Funding and Financing Options

The City will pursue grant funding for the plan update.

Equity Considerations

Through intentional economic development planning, economic growth can be harnessed to achieve community goals related to quality of life, equity, and climate action. Clean-tech innovation and other tech sector jobs will continue to be important, however other skillsets related to building trades, textile, production, and building materials production and reuse, agriculture, and many other fields will also be needed to achieve the objectives of the Climate Action Plan while growing economic opportunities for all.

Economic Development Considerations

Economic development is the primary focus of this action.

Case Studies

- [East Bay Community Energy Local Development Business Plan](#)
- [City of Riverside – Economic Prosperity Action Plan and Climate Action Plan](#)
- [Smart & Clean Helsinki](#)
- [City-Business Climate Alliances](#)
- [VentureLab](#)

Tracking Progress

The City will report on the progress of plan development through adoption and implementation progress thereafter.



Leadership 2.2 Research methods to support local contractors and labor.

The concept of a “Green New Deal” was first presented nationally in early 2019. Since then, local versions of it have appeared across the US, including in Los Angeles and New York. While the “green” part of the Green New Deal is central, equally important is the “new deal” part, which asks how the effort to decarbonize the economy can be used to support workers and families through job training and wages that allow people to live where they work. The resources of a City like San Luis Obispo are a small fraction of those available to federal, state, or major metropolitan governments. However, the City is still interested in finding ways to support local businesses and workers to achieve quality of life, equity, *and* climate action objectives. City staff will conduct a review of existing and proposed local government programs that focus on local business and labor, identify areas of regulatory authority, and research opportunities and barriers to implementation of a program that would support local contractors and labor.

Responsible Department – Administration

Timeline

The City will seek partnership with Cal Poly for the effort to be completed as part of academic research and will return in the 2023 Climate Action Plan with specific recommendations for implementation.

GHG Reduction Estimates

The strategic approach to developing a low carbon economy is supportive of the carbon neutrality goal but does not itself reduce greenhouse gas emissions.

Funding and Financing Options

Staff will complete this research within existing budgeted staffing resources.

Equity Considerations

Support for local labor, particularly in the building trades, could provide more diverse head of household jobs, which could benefit low- and moderate-income residents.

Economic Development Considerations

Investment in local contractors and workers could increase the amount of money that stays in the community and region and could promote a virtuous cycle of increased local work, increased local wages, and increased economic growth.

Case Studies

- City of San Luis Obispo Project Labor Agreement

Tracking Progress

The City will report on the progress of completed research by 2021 and inclusion in the 2023 Climate Action Plan.



Leadership 3.1 Create a formal approach to support and empower community collaboration for climate action.

As discussed in Chapter 1, local governments are uniquely capable of certain actions to influence climate outcomes. Similarly, local organizations and businesses throughout the community and region are also uniquely suited to achieve certain climate actions. For the community to achieve its climate action goals, all of these different types of organizations need to coordinate and collaborate.



This action seeks to establish a process for coordination and collaboration to ensure those organizations that take action receive community attention and praise and those organizations that want to achieve action are supported through connections to information and other resources. It is envisioned that this will initially be a program to publicly recognize organizations that have or are taking actions to achieve the community’s climate targets. Depending on the success of that program, it could shift over time to a program where the City facilitates collaboration and coordination between organizations.

Responsible Department – Administration

Timeline

The City will begin the first public recognition of local climate action accomplishments immediately following adoption of this Climate Action Plan. The City will consider more formal coordination structures in 2021.

GHG Reduction Estimates

The strategic approach to developing a low carbon economy is supportive of the carbon neutrality goal but does not itself reduce greenhouse gas emissions.

Funding and Financing Options

This action will be completed with existing staff resources.

Equity Considerations

The program will include a focus on publicly celebrating actions from community organizations that aren’t traditionally considered “environmental” organizations and will seek to provide access to external resources to these organizations.

Case Studies

- [SLO County Green Business Network](#)
- [City of Austin Green Business Leaders](#)

Tracking Progress

The City will track progress by reporting the number of organizations formally acknowledged.

PILLAR 2: CLEAN ENERGY SYSTEMS

Affordable, accessible, abundant, and clean energy systems are the foundation of a low carbon economy that equitably thrives in a changing climate. Rapid transitions to carbon neutral electricity that supports local economic development is possible through community choice energy and partnerships with the city's energy utility providers. The Clean Energy Systems pillar focuses on grid-based energy sources (electricity and natural gas). The goal for this pillar is carbon free electricity by 2020, with additional efforts to understand natural gas decarbonization technologies, support affordable and equitable access to clean energy, and coordinate utility investments in electrical and natural gas grid reliability.

Clean Energy Systems Goal:
100 percent carbon free electricity by
2020

Total Emissions Reductions in 2030:
26,050 MTCO_{2e}

Total Emissions Reductions in 2035:
39,010 MTCO_{2e}

Equity, Quality of Life, and Economic Development Opportunities

With new renewable energy projects proposing prices that are comparable with or cheaper than fossil fuel resources, a carbon neutral and increasingly renewable electricity supply will provide continued costs savings on the electricity generation component of local electricity bills. System wide, the transition of energy procurement to a value-driven public agency provides local accountability, accelerated transition to clean energy, and the ability to retain the money spent on energy in the region through local energy programs.

City Leadership

The City exhibited leadership in this pillar by joining Monterey Bay Community Power.

Foundational Actions

The Foundational Actions in this pillar are:

- Energy 1.1 – Launch Monterey Bay Community Power and achieve a 98% participation rate while advocating for programs that support equity and achieve maximum local benefit.
- Energy 2.1 – Work with MBCP and PG&E to develop a regional grid reliability strategy.
- Energy 3.1 – Partner with SoCal Gas to research options for reducing greenhouse gas emissions associated with the existing natural gas grid.

Clean Energy Systems 1.1 – Launch Monterey Bay Community Power and achieve a 98% participation rate while advocating for programs that support equity and achieve maximum local benefit.

Grid based electricity accounts for approximately 9.5 percent of the City's 2016 greenhouse gas emissions inventory. On January 1, 2020, the City began receiving energy from Monterey Bay Community Power (MBCP), a Community Choice Energy (CCE) program that provides 100 percent carbon free electricity with a rate savings relative to PG&E. CCEs bring local control, freedom of choice and competition into the electricity marketplace by allowing local governments to pool the electricity demand of their communities and purchase power with higher renewable content and lower greenhouse gas emissions. Energy from MBCP is delivered the City's existing grid with PG&E.



California CCEs are “opt-out” by statute, meaning that every electricity meter in the community is automatically enrolled, but has the option to opt-out of the CCE at any time.⁹ As of February 17, 2020, the City has a total MBCP enrollment opt-out rate of 1.79 percent, meaning that 98.21 percent of accounts were participating in the program.¹⁰ To maximize enrollment, City staff have allocated ongoing time to support local participation in MBCP.

Partnership with MBCP has allowed the City to achieve its Clean Energy Systems pillar goal of 100 percent carbon free electricity by 2020.

Responsible Department - Administration

Timeline

The City began receiving service from MBCP on January 1, 2020.

GHG Reduction Estimates

Based on the assumption of a 2 percent opt-out rate for residential accounts observed above, it is estimated that participation in MBCP will reduce forecast emissions by 26,050 MTCO₂e in 2030 and 39,010 MTCO₂e and in 2035.

Funding and Financing Options

The City currently hosts remote locations for Policy Board and Operations Board meetings and provides staff to support the region's Policy Board and Operations Board members (currently, the Mayor and City Manager).

⁹ http://www.leginfo.ca.gov/pub/01-02/bill/asm/ab_0101-0150/ab_117_bill_20020924_chaptered.pdf

¹⁰ Opt-out information was provided via email from MBCP staff on February 17, 2020.

Equity Considerations

MBCP will purchase cleaner energy at a lower cost than the existing Investor Owned Utility, which supports low-income rate payers while reducing greenhouse gas emissions. More important than rate savings, though, is the potential of equity focused energy programs. The City will continue to advocate for policy and energy program design that center benefits on low income and disadvantaged communities to ensure access to electric vehicles, clean energy in homes, solar energy systems, and resilient energy systems.

Economic Development Considerations

As a mission driven local government organization, MBCP helps to support economic vitality because money from rates paid by local customers stays in the Central Coast. Surplus revenues that would normally leave the community in a for-profit corporation will instead stay in the community to help fund regional renewable energy programs and projects, create jobs, and stimulate the economy.

Tracking Progress

The City will annually obtain the agency’s “power content label” from MBCP, which discloses the power portfolio sources and confirms the carbon neutral power supply. The City will also receive annual opt-out rate updates.



Clean Energy Systems 2.1 – Work with MBCP and PG&E to develop a regional grid reliability strategy.

The City recognizes that a low carbon contemporary economy depends on a reliable, resilient, and safe electric power system. Recent power shut offs in the state of California have had concerning economic repercussions and highlighted income inequalities that will likely be exacerbated as climates continue to shift. The City will partner with MBCP and PG&E to develop a strategy to maximize its regional grid reliability.

Responsible Department - Administration

Timeline

The development of the regional grid reliability plan will be initiated as part of the Safety Element Update of the General Plan project (initiated in Fiscal Year 2019-2020 and be completed by 2023). Implementation of the strategy will begin in concurrence with the 2023-25 Financial Plan and will be ongoing through 2035 and beyond.

GHG Reduction Estimates

Grid reliability does not reduce greenhouse gas emissions on its own, but it does allow for continued access to affordable carbon neutral electricity, which is the foundation of the Green Buildings Pillar, and includes components of the Connected Community Pillar.

Funding and Financing Options

Staff time for the effort will occur as part of existing budgeted resources. Funding for community vulnerability is included in a grant from Caltrans to conduct a comprehensive community vulnerability assessment to the impacts of climate change that is already underway. Funding and financing for improvements to local and regional grid infrastructure will be identified and will depend strongly on financial investments from PG&E and MBCP.

Equity Considerations

Power outages present additional risk to already vulnerable populations. Individuals who depend on electrical medical equipment at home are susceptible to increased health concerns and medical bills when unable to access power. Additionally, low-income individuals are disproportionately burdened when power outages cause workplace closures and may face food insecurity without refrigeration. Minimizing the frequencies and durations of power outages will reduce these threats.

Economic Development Considerations

Grid reliability affects buildings such as hospitals, storefronts, restaurants, telecommunications systems, and government buildings – all of which are integral to a functioning economy.

Case Studies

- [MBCP Community Resilience Programs](#)
- [PG&E and East Bay Community Power Collaboration](#)

Tracking Progress

The City will track the number and nature of meetings with each utility in the first year of implementation. Thereafter, the City will report on progress towards grid resilience and reliability.

Clean Energy Systems 3.1 – Partner with SoCal Gas to research options for reducing greenhouse gas emissions associated with the existing natural gas grid.

Many buildings in San Luis Obispo use natural gas for space heating, water heating, and cooking. The combustion of natural gas emits CO₂. For San Luis Obispo in 2019, this accounted for 51,310 MTCO₂e, or approximately 15 percent of inventoried emissions. Direct methane leaks at extraction and processing facilities, along transmission and distribution routes, and in the end use location means that the emissions from natural gas use are likely substantially higher than those reported in the inventory.

The existing natural gas grid serves most of the community, and regardless of the Clean Energy Choice Program for New Buildings encouraging all-electric new buildings (See Green Buildings 1.1), the natural gas grid will continue to grow in San Luis Obispo for the next several years. Due to the extremely potent global warming potential of methane, the City will request to work with SoCal Gas to better understand distribution system, lateral connections, and on-site system leaks in the community and identify ways to reduce them.

Additionally, SoCal Gas has provided presentations that biogas can be used to lower the overall greenhouse gas emissions from grid-based natural gas. In meetings with the utility, SoCal Gas staff confirmed that there are no unused sources of biogas in the community that currently could be used for grid applications, however, the City is interested in further exploration of potential biogas pilot projects. Additionally, City staff has met with SoCal Gas on several occasions to discuss developing methods for quantifying the impacts of fugitive methane emissions and related savings from biogas, as well as searching for innovative pilot projects for low carbon fossil fuel technologies.

Responsible Department - Administration

Timeline

The City has already met with SoCal Gas's sustainability and project development staff in late 2019 and again in February 2020. The City will plan on establishing a regular meeting schedule with SoCal Gas's sustainability staff to further pursue local leak assessment and reduction research, biogas resources, and accounting for introduction of biogas into the natural gas distribution and transmission system with the expectation that work could begin on these topics as early as Fiscal Year 2020-21.

GHG Reduction Estimates

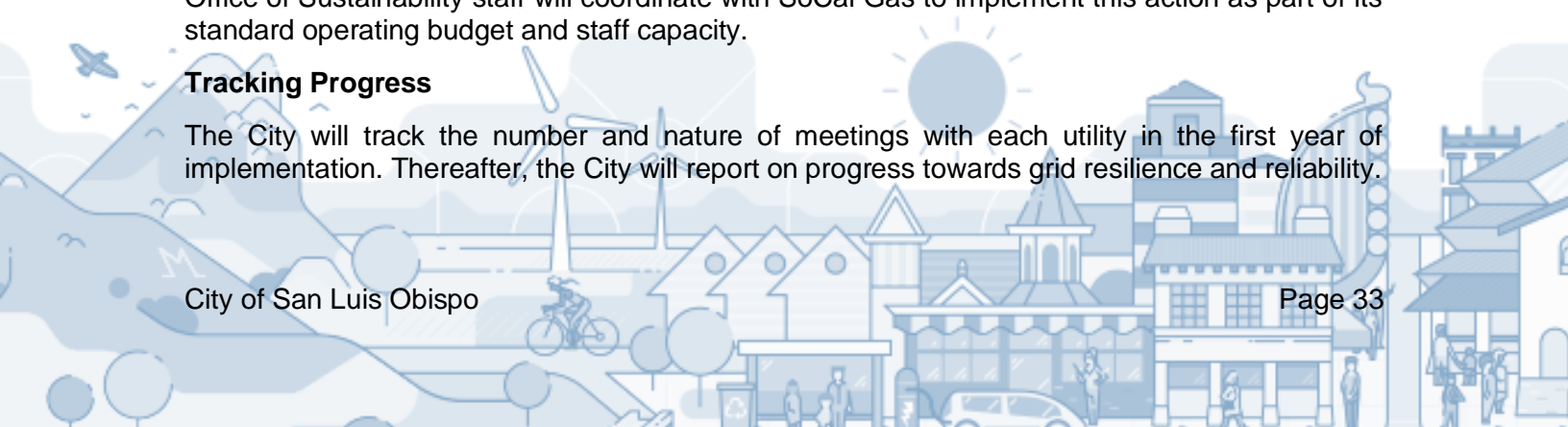
Due to insufficient accounting protocols for methane leakage, this action does not include any greenhouse gas emissions reductions. However, the action allows the City to better understand these emissions sources and identify ways to reduce them in future Climate Action Plans.

Funding and Financing Options

Office of Sustainability staff will coordinate with SoCal Gas to implement this action as part of its standard operating budget and staff capacity.

Tracking Progress

The City will track the number and nature of meetings with each utility in the first year of implementation. Thereafter, the City will report on progress towards grid resilience and reliability.



PILLAR 3: GREEN BUILDINGS

Advances in on-site solar energy systems, electrical appliances, and grid-based energy provide a significant opportunity. These advances provide for all-electric buildings to maintain all the conveniences and comforts of standard buildings without the climate pollution caused through the use of fossil fuels. Rapid transitions to low carbon buildings is possible through a two-pronged approach: by identifying the largest energy users and working to provide cash positive financing mechanisms; while also working with homeowners and building owners to subsidize and support onsite solar, energy storage, and transitioning high energy use appliances (e.g., water heating and space conditioning) to high efficiency electric alternatives.

Green Buildings Goals:

No net new building emissions from onsite energy use by 2020; 50 percent reduction in existing building emissions (after accounting for MBCP) by 2030

Total Emissions Reductions in 2030:
11,960 MTCO_{2e}

Total Emissions Reductions in 2035:
26,740 MTCO_{2e}

The Green Buildings pillar focuses on emissions from energy (electricity and natural gas) used in buildings, facilities, and outdoor lighting in the community. The goal for this pillar is to add no net emissions from new buildings starting in 2020 and reduce emissions from the remaining building stock by 50 percent (after accounting for savings from carbon free electricity) by 2030.

With clean electricity as the foundation of a carbon neutral community, and with rapid advances and cost reductions in onsite solar generation, onsite energy storage, and electric appliances, the potential exists to equitably and affordably transition to fossil fuel free buildings.

This pillar focuses on high impact programs that: produce carbon neutral new buildings; leverage existing programs; provide funding sources for income qualified households; and develop financing mechanisms to address the communities largest natural gas users by assisting building owners to increase efficiency and retrofit natural gas water heating and space conditioning to electric appliances.

Rapid transitions to low-carbon new buildings (from onsite energy use) is possible via the City's Clean Energy Choice Program for New Buildings and the 2019 California Energy Code (and standard triennial updates to both). Existing buildings will be a substantially more challenging issue as every building is unique and many existing buildings may require costly electrical system upgrades to transition to lower carbon buildings.

The emissions from electricity are primarily reduced by joining Monterey Bay Community Power, as described in "Clean Energy Systems", above. Natural gas consumption occurs in buildings and facilities primarily for water heating, space heating, cooking, clothes drying, and decorative space

heating (e.g., gas fireplaces). While some natural gas end uses may always require fossil fuels to operate (e.g., industrial processes for manufacturing), all common residential and commercial natural gas end uses have high quality, high efficiency, and typically cost-effective electric alternatives. As buildings become more efficient and as building owners choose to transition from fossil fueled to electric appliances, the emissions associated with onsite energy use will rapidly decline.

Equity, Quality of Life, and Economic Development Opportunities

As described below, although the generation costs associated with electricity are projected to stay flat or decrease as the result of low cost new renewable energy facilities, transmission costs are likely to fluctuate substantially as climate change exposes the statewide grid to ever increasing natural hazards. As the state moves towards decarbonization and the state's natural gas system ages, natural gas utility costs are also expected to increase and fluctuate. A focus on supporting low income households in installing rooftop solar and pairing that with high efficiency electric appliances for space and water heating allows enhanced comfort and insulation from fluctuating electricity and natural gas grid costs.

A rapid mobilization in the solar installations, energy efficiency installations, and appliance switching is a “win-win” in that there are typical lifetime savings associated with the work for the building owner while also creating a substantial demand for skilled labor. Additionally, transitioning existing buildings at speed and scale will require technological innovations. By partnering with organizations that support entrepreneurs, local business can pair their innovation and ingenuity with emerging needs, creating additional head of household jobs and local economic stimulus.

City Leadership

The City has already begun strategically retrofitting existing buildings to electric appliances. One example is the planned retirement of the natural gas co-generation system at the SLO Swim Center and replacement with onsite solar generation to replace the lost generation capacity of the existing system. As described in the “Lead by Action” section, above, the City will also develop a plan to achieve carbon neutral operations, including in building and energy use, by 2030. The City will exhibit regional leadership as an advocate by continuing to influence Monterey Bay Community Power energy program development and implementation and partnering with existing entities to maximize local resources for building retrofits.

Foundational Actions

The Foundational Actions in this pillar are:

- Buildings 1.1 – Adopt and implement the Clean Energy Choice Program for New Buildings and review opportunities for improvement in the 2022 code cycle.
- Buildings 2.1 – Conduct comprehensive retrofit program study and develop and implement a strategic and equity focused building retrofit program by 2021.



Green Buildings 1.1 Adopt and implement the Clean Energy Choice Program for New Buildings and review opportunities for improvement in the 2022 code cycle.

The City developed the Clean Energy Choice for New Buildings, a package of incentives and local amendments to the 2019 California Energy Code, that encourages all-electric new buildings. When paired with the carbon free electricity purchased by Monterey Bay Community Power, all electric new buildings are carbon free and avoid health and safety issues associated with fossil fuels



The Clean Energy Choice Program for New Buildings includes the following incentives: technical support, financial incentives, regulatory flexibility, and information sharing support. The City is providing ongoing staffing to support successful implementation of the program.



The City has also developed a Carbon Offset Program to support the Clean Energy Choice Program for New Buildings. City Staff will present program performance to City Council in June of 2021, and if needed, will also provide the Carbon Offset Program for Council consideration and potential adoption.

Responsible Department – Community Development and Administration

Timeline

The Clean Energy Choice Program for New Buildings will be brought before Council in 2020 and is expected to include implementation of building code amendments in September of 2020. The Carbon Offset Program could be brought to Council in June of 2021 depending on program performance. City staff will participate in statewide efforts to enhance the 2022 Building Code and will incorporate lessons learned into proposed local amendments when that code is enforceable in 2023.

GHG Reduction Estimates

Assuming General Plan Buildout by 2035, and greenhouse gas emissions reductions estimates for Climate Zone 5 used in the 2019 Cost Effectiveness Studies, and assuming that 85 percent of applicable new buildings comply through 2030, and 95 percent of buildings comply through 2035, the City expects to avoid 3,780 MTCO_{2e} in 2030 and 6,250 MTCO_{2e} from this action annually in 2035.

Funding and Financing Options

The City has completed technical work for the local amendments to the 2019 California Energy Code and expects to begin implementing the program in September of 2020. Direct incentives

through the incentive program are provided by MBCP and staff has issued a work order for on-call technical support as part of the 2019-20 mid-year budget adjustment.

Equity Considerations

The future of grid-based energy costs (electric and natural gas) is highly uncertain in a rapidly changing climate and regulatory structure. New all electric buildings use net energy metering with their solar energy systems to insulate themselves from grid energy costs. To ensure limited exposure to cost uncertainties as designers and builders build capacity, the City successfully advocated to Monterey Bay Community Power to provide direct financial incentives for all-electric multi-family and affordable housing units.

Economic Development Considerations

By transferring energy bills in new development from a natural gas utility to PG&E and the City's community choice energy provider (Monterey Bay Community Power), money spent on energy will be retained in the region and reinvested through regional energy projects, lower rates, and enhanced energy programs (as a local government agency that is mission driven, rather than profit driven, Monterey Bay Community Power can retain capital in the region and with further advocacy, can support the City's green economic development initiatives as identified in Pillar 1). Additionally, a recent study out of UCLA noted that the transition to all electric development will lead to a net increase in jobs, particularly for skilled workers in construction, manufacturing, and energy.¹¹ An intentional effort in Economic Development Strategic Plan (see Pillar 1) could help maximize these benefits locally and regionally.

Tracking Progress

Through the City's permit tracking program, the City will record and report the number and type of permits for all-electric buildings and mixed-fuel buildings.

¹¹ 2019. Jones et al. *California Building Decarbonization Workforce Needs and Recommendations*. https://innovation.luskin.ucla.edu/wp-content/uploads/2019/11/California_Building_Decarbonization.pdf



Green Buildings 2.1 Conduct comprehensive retrofit program study and develop and implement a strategic and equity focused building retrofit program by 2021.

Energy use in existing buildings will continue to contribute substantial amounts of greenhouse gas emissions. The retrofit program study and proposed retrofit program will convene all relevant stakeholders, inventory existing building stock and energy use, and identify a program that will equitably and strategically achieve the community's emissions reductions objectives. The program will review potential policy measures, including adding renewable energy systems, replacing fossil fuel appliances with clean electric appliances, improving comfort and efficiency of buildings mechanical and lighting systems, and improving building envelopes. The City will consider a wide range of implementation methods, including benchmarking or energy score requirements, potential ordinances, incentives, voluntary actions, education, and workforce development.

The quantification for this action is included in Table 5.1 and Appendix B and shows one path to achieving the City's targeted reduction, with roughly 60 percent of existing energy load in existing buildings participating in some form. However, there are many paths to achieve the reductions presented in this action and the development of the retrofit program should be tied to the emissions reduction outcomes while retaining flexibility in how they are achieved.

While the development of a transformational program of this nature does not have many examples to build from, it should be noted that the proposed parameters of the program are consistent with the state's 2019 Energy Retrofit Action Plan¹², SB 350's target of 50 percent increase in existing building energy efficiency by 2035, the CPUC's decision to open up the state's \$1 billion in energy efficiency funding for electrification measures, and the CPUC's decision to invest \$44 million in electrification retrofit incentives and research in electrification retrofit programs.

Responsible Department – Community Development and Administration

Timeline

The City will initiate the project in Fall 2020 and will complete the plan and adopting resolutions or ordinances by summer of 2021. The City will begin implementing the program in 2021 and will continue through 2035.

GHG Reduction Estimates

The plan itself will not reduce greenhouse gas emissions, however it sets the foundations for deep reductions in existing building emissions that will occur through implementation of the plan starting in 2021 and continuing through 2035. Table 3.3 provides a summary of the quantification and while the total emissions reductions should be viewed as the goal for the City as it collaboratively develops the program, the emissions by each retrofit type may vary substantially.

¹²2019 Statewide Energy Efficiency Action Plan - [https://ww2.energy.ca.gov/business_meetings/2019_packets/2019-12-11/Item_06_2019%20California%20Energy%20Efficiency%20Action%20Plan%20\(19-IEPR-06\).pdf](https://ww2.energy.ca.gov/business_meetings/2019_packets/2019-12-11/Item_06_2019%20California%20Energy%20Efficiency%20Action%20Plan%20(19-IEPR-06).pdf)

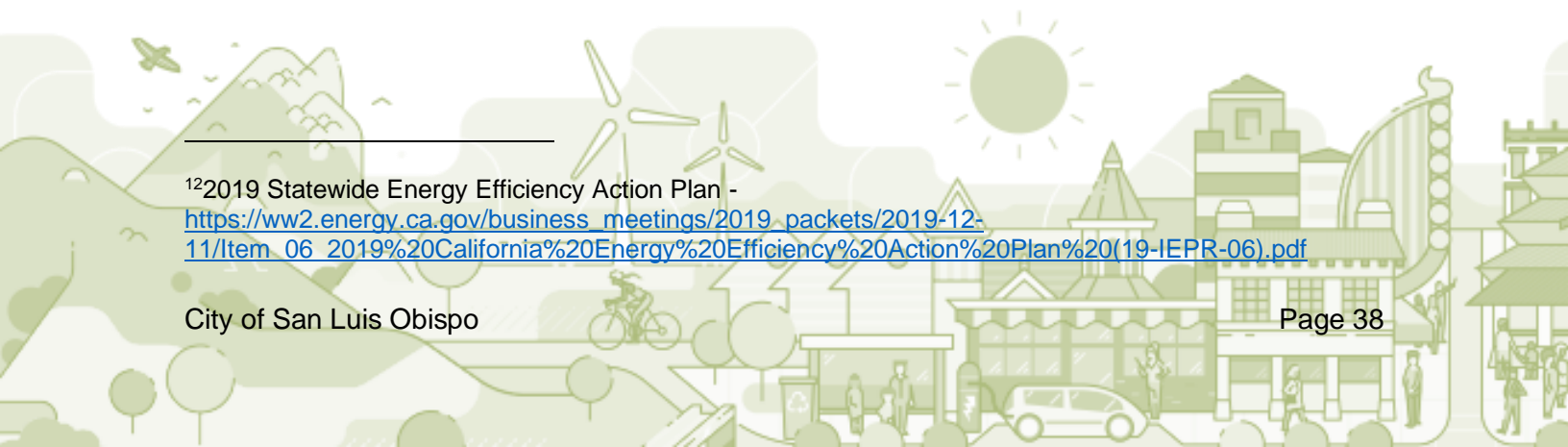


Table 3.3 Projected MTCO_{2e} Savings by Retrofit Type, 2030 and 2035

		2030	2035
Electrification Retrofits	Commercial	670	870
	Residential	4,170	13,540
Retrocommissioning	Commercial	530	820
	Residential	990	1,530
Energy Retrofits	Commercial	950	1,710
	Residential	830	1,900
Commercial Benchmarking		40	120
Total		8,180	20,490

Funding and Financing Options

The 2019-21 Financial Plan includes \$50,000 for the development of the Building Electrification Program. The City is in talks with a national organization to partner with several Central Coast cities to collaboratively develop a decarbonization retrofit program and to expand the technical and financial resources available to the City for planning. Funding and financing for implementation will be a substantial challenge and will include leveraging public programs through MBCP, 3C-REN, PG&E, and SoCal Gas, identifying ways to enhance existing financing mechanisms such as Property Assessed Clean Energy, advocating for retrofit programs through MBCP, and monitoring state programs for funding opportunities.

Equity Considerations

When developing the retrofit program, the City will consider the needs of all residents and property owners. The City will focus initial program efforts on the largest and least efficient buildings to maximize immediate program impacts. In addition, the City will focus incentives and subsidies on low-income and disadvantage communities to ensure the program helps reduce utility bills.

Economic Development Considerations

Investment in local contractors and workers to lead the study and program development could increase the amount of money that stays in the community and region and promote a cycle of increased local work, increased local wages, and increased economic growth.

Case Studies

- [California Energy Efficiency Retrofit Plan](#)
- [“City Energy Project” for Developing Retrofit Programs](#)
- [Tri-County Regional Energy Network](#)
- [City of San Francisco Building Energy Benchmarking Program](#)
- [City of New York Building Energy Grades](#)
- [State of California Energy Benchmarking Program](#)

Tracking Progress

The City will report on plan development progress until adoption. Starting in 2021, implementation progress that triggers a permit will be tracked through the Community Development Department’s permit tracking system.

PILLAR 4: CONNECTED COMMUNITY

An increase in active transportation investment coordinated with more housing production, enhanced transit, and mobility innovations can significantly reduce cost of living and increase quality of life. This additionally reduces vehicle miles travelled (VMT) and associated greenhouse gas emissions. For the many local and regional households that will still depend on a vehicle for transportation, electric vehicles coupled with carbon neutral electricity can provide a low emissions alternative.

Connected Community Goals:
Achieve General Plan Mode Split Objective by 2030; 40 percent VMT by electric vehicles by 2030

Total Emissions Reductions in 2030:
45,240 MTCO_{2e}

Total Emissions Reductions in 2035:
64,170 MTCO_{2e}

Transportation is the single largest source of greenhouse gas emissions in the City of San Luis Obispo. Transportation emissions primarily occur as the result of single occupancy fossil fueled vehicles. The goal for this pillar is to achieve the General Plan Mode Split Objective by 2030 and have 40 percent of the remaining automotive vehicle miles travelled occur through electric vehicles.¹³ Table 3.4 provides the baseline 2020 mode split and the 2030 objectives.

Table 3.4 Mode Split Objectives, 2020 and 2030

	2020*	2030
Single-occupancy vehicle	67.7%	50%
Walking, carpool, and other	20.6%	23%
Transit	2.3%	7%
Bicycle	8.3%	20%
Total		

*American Community Survey 2012-2017 data used as a proxy for 2020

This pillar focuses on advanced coordination between related fields of transit, active transportation, parking, and housing development as well as on transformational operational changes that will allow for more active transportation investments to be made at a more rapid rate and lower per unit cost.

¹³ The General Plan set the following mode split objective for city resident trips: 50% of trips occur via motor vehicles, 12% of trips occur via transit, 20% of trips occur via bicycles, and 18% of trips occur via walking, carpools and other forms.

Rapid transitions to achieve the Circulation Element of the General Plan's mode share target five years early will require increased density and housing production, innovative parking management approaches, further commitments to transit, and a process to allow for rapid construction of active transportation infrastructure. In all cases, equity and accessibility must be a top priority to ensure residents can conveniently and affordably move about the City without the use of a fossil fueled vehicle.

It should be noted that reducing emissions from regional commute trips is especially difficult as the activity of commuting to and from City requires the crossing of multiple jurisdictional boundaries and is induced by a lack of affordable housing options in the city. The City will focus on internal trips first, with secondary high priority focus supporting reducing emissions from regional trips through addressing the City's job/housing imbalance, housing affordability, and access to electric vehicles and charging infrastructure.

Equity, Quality of Life, and Economic Development Opportunities

Cities and regions built for cars accommodate long commute times, which are expensive, isolating, and polluting. This pillar looks to provide affordable, safe, and convenient access through the community so that income is not a limiting factor in mobility. Additionally, for households that must or choose to live somewhere that requires a personal vehicle, electric vehicles have low operational costs and can lead to substantial total cost of ownership savings relative to a fossil fuel vehicle.

City Leadership

The City will play a major leadership role in this effort through the construction and maintenance of active transportation infrastructure, prioritization of streets and public rights of way for people before automobiles, enhancement of transit services to include all electric buses and to increase bus frequency, introduction of a micro-mobility "bike share" program, and further installation and innovative management of electric vehicle charging infrastructure. The City will also lead through continued purchasing of plug-in hybrid vehicles and electric bicycles for its fleet.

Foundational Actions

The foundational actions of this pillar are:

- Connected 1.1 – Establish a consistent method for tracking and reporting mode split metrics.
- Connected 1.2 – Research and develop an approach to a "Mobility as a Service" platform for people to easily use all modes of low carbon mobility in the City.
- Connected 2.1 – Complete Active Transportation plan and begin implementation immediately.
- Connected 2.2 – Launch micro mobility program by 2021.
- Connected 3.1 – Establish a policy and strategic approach to leveraging existing and new parking garages for downtown residential and visitor serving uses and to allow for further implementation of the Downtown Concept Plan.
- Connected 4.1 – Develop transit electrification strategic plan and begin implementing in 2020.
- Connected 4.2 – Shorten transit headways through accelerated implementation of the existing Short-Range Transit Plan.
- Connected 4.3 – Explore additional innovative transit options in the 2022 Short-Range Transit Plan (e.g., on-demand deviated routes, electric fleet expansion, micro transit, Bus Rapid Transit, Transit Signal Priority).

- Connected 4.4 – Assess feasibility of a “free to the user” transit ridership program.
- Connected 5.1 – Complete the 2019-21 Housing Element of the General Plan Update and Flexible Zoning Requirements for Downtown.
- Connected 6.1 – Develop and begin implementing electric mobility plan to achieve a goal of 40 percent electric vehicle miles traveled (VMT) by 2035.

Greenhouse Gas Emissions and Tracking Progress

Unlike the other sectors in this Climate Action Plan, actions related to mobility and mode share have a less direct correlation to a desired outcome. For example, it is relatively straight forward to estimate the savings of switching an incandescent lightbulb to an LED lightbulb, but estimating the savings that could occur from a mile of bicycle lane, increased accessibility via a bike share program, or increased transit service is substantially more challenging. For this reason, the overall mode split will be monitored through a method established in Connected 1.1 and the effectiveness of individual actions will be evaluated in-light of this monitoring.

Specific actions in this pillar that can be directly associated with greenhouse gas emissions are reported as such, but generally the actions in this pillar are intended to create systems of clean transportation that leads to the estimated emissions reductions. For reference, Table 3.5 provides the estimated emissions reductions by activity.

Table 3.5 Connected Community Greenhouse Gas Emissions Reductions, 2030 and 2035 (MTCO₂e)

	2030	2035
Electric Vehicles (All VMT)	22,180	34,920
Mode Shift (Internal VMT Only)	23,060	29,250
- <i>Carpool and Walking</i>	<i>5,100</i>	<i>5,100</i>
- <i>Transit</i>	<i>5,340</i>	<i>8,750</i>
- <i>Bicycle</i>	<i>12,620</i>	<i>15,400</i>
Total GHG Emission Reductions	45,240	64,170

Connected 1.1 Establish a consistent method for tracking and reporting mode split metrics.

The Land Use and Circulation Element of the General Plan and its Environmental Impact Report set the following mode split objective for city resident trips: 50 percent of trips occur via motor vehicles, 12 percent of trips occur via transit, 20 percent of trips occur via bicycles, and 18 percent of trips occur via walking, carpools and other forms. The City has informally used several points of reference to estimate mode share over time, including the US Census's American Community Survey commute data, the city's biennial traffic data collection program, and local travel survey data; however, the city has not yet established a formal methodology for tracking and reporting mode split progress. A more detailed, regularly updated, locally conducted travel survey would allow for progress to be more adequately tracked. A professional survey or study requires outside expertise and this action would provide direction to pursue funds through grant resources or via future Financial Plans to establish a repeatable method.

Responsible Department – Public Works

Timeline

This action will be initiated in the 2021-23 Financial Plan funding cycle.

GHG Reduction Estimates

The action does not reduce emissions itself, however, it would provide an approach to track the GHG reductions occurring as the result of actions in this Climate Action Plan.

Funding and Financing Options

Similar work completed for the City of Santa Monica was contracted for approximately \$40,000. City staff would pursue funding for this approximate amount via grant funding or as part of the 2021-23 Financial Plan funding cycle.

Equity Considerations

A defensible and consistent method for tracking mode splits would ensure participation from groups that typically do not participate in surveys or may be missed in past efforts.

Case Studies

- [Santa Monica Transportation Survey](#)
- [City of Boulder: Mode Shift in the Boulder Valley](#)

Tracking Progress

The City will report on action development and implementation progress through its inclusion in the 2021-23 Financial Plan.



Connected 1.2 Research and develop an approach to a “Mobility as a Service” platform for people to easily use all modes of low carbon mobility in the City.

Transportation is responsible for the majority of carbon emissions in the City of San Luis Obispo. The City currently operates an award-winning bus system and plans to facilitate a variety of external partnerships to bring more mobility options into the community. In order to effectively encourage residents and visitors to utilize



these better modes of low-carbon transportation and make them as accessible and convenient as possible, this action would initiate research of options for establishing an (or leveraging an existing) online platform where users are able to access information about each type of mobility offered in San Luis Obispo. The platform would include specific access locations and routes on an interactive map, and a centralized payment hub.

In addition to lowering barriers of entry to transit, the forthcoming bicycle share program, and other emerging mobility options, a centralized platform would also allow the City to incorporate equity considerations such as providing no cost or reduced cost access for income qualified residents. Similarly, a centralized platform could be used to support alternative mobility options for employees or residents in a new development as a condition of development approval or could be used by hotels and downtown businesses to help visitors access alternative forms of transportation.

Responsible Department – Public Works and Administration

Timeline

This action will be initiated in the 2021-23 Financial Plan funding cycle.

GHG Reduction Estimates

The action does not reduce emissions itself, however, it would provide a foundation to facilitate rapid, equitable, and convenient transition to active transportation and transit options.

Funding and Financing Options

Funding for initial research and technical feasibility will be requested in the 2021-23 Financial Plan. In that process, the specific development pathways, associated costs, and funding and financing options will be identified. It is expected that major funding pathways include state and regional grants or public-private partnerships.

Equity Considerations

A major benefit of a centralized platform is that, if feasible, the City could provide lower or no cost access for income qualified residents. Should this be feasible, users from low-income households will be able to freely and easily access information about the suite of low-carbon mobility services found within the City. Additionally, those who do not own cars in and around San Luis Obispo will benefit from the platform connecting them with alternative transportation methods. The platform

could also feature a series of filters for users to determine which service is appropriate for their needs based on the service's fee, the distance from the user to service access, and more.

Economic Development Considerations

The development of a “Mobility as a Service” platform inherently creates space for the City to pursue strategic external partnerships with alternative mobility companies. The opportunity for these partners to invest money and resources into the community will bring new jobs into the community, especially as the demand for low-carbon alternative mobility continues to expand over the next decade. The platform will also help expand physical connections between users and critical areas of local business, especially those that are parking-restricted, like downtown. By securing and promoting new opportunities for consumers to reach places of business around San Luis Obispo, previously under-served revenue sources are engaged and mobilized.

Case Studies

- [Whim App \(Helsinki, Finland\)](#)
- [Hopthru \(Bay Area\)](#)
- [Google Maps allows purchase of transit and bikeshare tickets in Denver](#)

Tracking Progress

The City will report on action development and implementation progress through its inclusion in the 2021-23 Financial Plan.



Connected 2.1 Complete Active Transportation Plan and begin implementation immediately.

The City is updating the Bicycle Transportation Plan and transforming it into an Active Transportation Plan to include both bicycling and walking needs. The last major update of the City's bicycle plan was in 2013 and this current update is an opportunity to include new innovations in bikeway facilities with a focus on designing an efficient, intuitive and safe bicycle and pedestrian transportation network for users of all ages all ability levels. This effort will also launch the City's first comprehensive document on pedestrian policies and identify ways to increase walking for transportation in the City and will consider how active transportation and transit are interconnected. The effort will present prioritization strategies to meet mode share targets for bicycling and walking and maximize the return on investments.



A key component of the plan will include developing a short list of the highest priority bicycle and pedestrian projects—projects that offer the greatest potential to increase walking and cycling mode share—and inclusion of a quick-build strategy to streamline implementation of these high priority projects. One of the largest barriers between the identification, proposal, and implementation of priority bicycle and pedestrian infrastructure is the traditional strategy in which the City funds, approves, and allocates materials for such projects. By utilizing a “quick-build” strategy, the City can make improvements with lower-cost, semi-permanent materials on a relatively quick timeline with the intent of actualizing the safety and connectivity benefits of these improvements in the short-term, while evaluating the success of the project after a given period and making changes prior to installation of permanent features in the long-term. For example, if the City was going to create a new protected bike lane, the traditional strategy would involve the appropriation of City funds or grants, intensive construction with permanent materials (asphalt, concrete, thermoplastic striping, etc.), and a completion date up to 2-3 years after project initiation, and often much longer depending on funding. However, with a quick-build strategy, designation of the bike lane would involve lower-cost materials within the City’s current budget (paint, flexible posts and prefabricated barriers, etc.), and a completion date around or within a year of project initiation.

Responsible Department – Public Works

Timeline

The development of the Active Transportation Plan is currently underway, and adoption and implementation will initiate in coordination with the 2020-21 funding cycle.

GHG Reduction Estimates

It is estimated that the GHG reductions occurring as the result of achieving the active transportation mode split objectives is 12,620 MTCO_{2e} in 2030 and 15,400 MTCO_{2e} in 2035.

Funding and Financing Options

Funding for this action is ongoing and accounted for in the City's annual budget through 2023. Additional funding is possible through state and federal grant sources as well as development fees.

Equity Considerations

Prioritization of quick build bicycle and pedestrian projects in the Active Transportation Plan will include community equity as a key consideration. The Plan will result in more infrastructure and opportunities to safely walk and bike within the City. This will be especially beneficial for low-income residents as the Plan creates more venues for low or no-cost travel. Additionally, those who do not own cars or are able to become a single car household will be able to enjoy the same benefits and the need for car ownership will lessen.

Economic Development Considerations

Enhanced mobility options for community members to reach various parts of the city, including downtown and other commerce hubs, will stimulate the local economy.

Case Studies

- [City of Santa Cruz Active Transportation Plan](#)
- [County of San Diego Active Transportation Plan](#)
- [Monterey County Active Transportation Plan](#)
- [People for Bikes Quick Builds for Better Streets](#)
- [San Francisco Municipal Transportation Agency \(SFMTA\) Vision-Zero Quick Build Strategy](#)
- [San Francisco County Transportation Authority Funds \\$5 million in Quick Build Safety Projects](#)

Tracking Progress

The City will monitor the development of the plan through adoption and implementation progress thereafter.



Connected 2.2 Launch micro mobility program by 2021.

Micro mobility is a type of transport that is provided by light vehicles including shared bicycles. Integration of various offerings of micro mobility into the transportation network of San Luis Obispo is critical in decreasing carbon emissions as it essentially “fills in the gaps” for trips that utilize public transit that cannot take riders “door to door”. To stimulate transit ridership and encourage community members to utilize low-carbon mobility options for short distance trips, micro mobility is key. The primary goal of the micro mobility program is to introduce a new bike share program and ultimately remove barriers to other sustainable, human-scale transportation options. City staff conducted a City Council study session in Fall 2019 and were provided direction to return with a mobility program focused on bicycles and e-bicycles. This program is included as a work task in the 2019-21 Financial Plan.

Responsible Department – Public Works

Timeline

The City will begin the process of identifying partners and vendors in the Fall of 2020 and will begin implementing the program in 2021.

GHG Reduction Estimates

This action is supportive of overall mode shift.

Funding and Financing Options:

Programs are either directly funded by an agency, operated through a cost sharing model with a partner, or leased out to a third party who owns and operates the programs. As a result of the differing models, significant cost ranges exist. Potential funding sources include State/Regional grants, public/private partnerships or sponsorships.

Equity Considerations

Introducing micro mobility options within the City will allow low-income and non-motor vehicle owning residents enhanced access to public transit and short-distance travel. Additionally, this will help alleviate geographic restrictions on employment opportunities for those who use transit to travel into the city for work.

Economic Development Considerations

As previously stated, enhanced mobility options for community members to reach various parts of the city, especially downtown and other commerce hubs, will stimulate the local economy.

Case Studies

- [Bike Share in Fremont](#)
- [Zagster Bike Share in Santa Clarita](#)
- [Bike Share Santa Cruz](#)

Tracking Progress

The City will report on the launch of the program initially and on ridership and utilization metrics thereafter.



Connected 3.1 Establish policy and strategic approach to leveraging existing and new parking garages for downtown residential and visitor serving uses and to allow for further implementation of the Downtown Concept Plan.

The City owns and operates three parking garages downtown and is expected to begin construction on a fourth garage when funds are available. The new parking garage would contain 404 parking spots and include approximately 43 electric vehicle charging stations and additional bicycle spots. Additional electric vehicle chargers are available at the Marsh Street Parking Garage, which includes 19 Level 2 chargers.



The parking garages allow for additional density and active transportation focus downtowns, while also providing access to electric vehicle charging for regional travelers.

However, to realize the potential of these garages, the City needs to develop an intentional strategic policy approach to issues such as cost recovery for electric vehicles, prioritization of low emissions vehicles, overnight access for residents and hotel guests, access to electric vehicle chargers for downtown employees, and ensuring that pass through electric vehicles charge downtown to drive traffic to local businesses.

It should be noted that there is overlap with the Mobility as a Service platform as described in Connected Community 1.1.

Responsible Department – Public Works and Administration

Timeline

This action will be initiated in summer of 2020 and any implementing actions will be contemplated in the 2021-23 Financial Plan.

GHG Reduction Estimates

This action is supportive of emissions reductions quantified for electric vehicle adoption and mode shift.

Funding and Financing Options

The City will seek to complete the work using existing staff budget time. Additional consultant support may be needed, and although the cost total is unknown at this time, it would be expected to be less than \$50,000. Should additional funding be needed, the City would seek access to funds through grant funding or in the 2021-23 Financial Plan.

Equity Considerations

By ensuring the capacity and function of new and existing parking garages is utilized to serve the needs of both Downtown visitors and surrounding residents, equity considerations about who uses these structures, when, and at what cost will be built into relevant policy and planning.

Additionally, parking and other services needs of those who live, work, and recreate in the western portion of Downtown will be served in a way that was not previously. Lastly, employees of adjacent businesses and other organizations will have new and enhanced access to subsidized parking and safe bicycle storage.

Economic Development Considerations

Expanding access to businesses Downtown will result in increased patronage and, potentially, stimulate further economic development. Additionally, revenue from parking garage rates will be re-invested into the community through City-facilitated programming.

Tracking Progress

The City will track and report on the number of internal meetings convened to develop a scope of work in calendar year 2020 and a firm approach to achieving that scope of work in calendar year 2021 and 2022.



Connected 4.1 Develop a transit electrification strategic plan and begin implementing in 2020.

In December of 2018, the California Air Resources Board (CARB) approved the Innovative Clean Transit regulation that sets a statewide goal for public transit agencies to gradually transition to 100 percent zero emission bus fleets by 2040. As stated by CARB in the regulation’s press release, “The transition to zero-emission technologies, where feasible, is essential to meeting California’s air quality and climate goals.”



The City of San Luis Obispo intends to exceed this goal by planning and implementing the transition far in advance of the state goal. To do this, the City will develop a transit electrification strategic plan to map out the timeline, costs, funding sources, and vendor selection pathway that will be undertaken beginning in 2020.

Initial work is underway with an in-process bus yard optimization study, an executed agreement for onsite solar generating assets, a planning grant awarded from the Air Pollution Control District, and tentative agreements with PG&E for cost covering related to electric vehicle charging infrastructure.

Responsible Department – Public Works and Administration

Timeline

The transit electrification strategic plan is currently being developed and implementation will begin in 2020 with work to install solar generating assets occurring in 2020 and charging infrastructure being installed in 2021 and 2022. Initial electric vehicle bus purchases may occur as early as 2020 with delivery slated for 2021.

GHG Reduction Estimates

This action is supportive of increased transit mode share and is not directly quantified.

Funding and Financing Options

A direct quote from the ICT Regulation states: “California transit agencies will be faced with higher capital costs during the early years of implementation of the proposed ICT regulation but will ultimately see reduced operational spending in later years...” An electric transit bus costs around \$250,000-300,000 more than a diesel transit bus. However, an electric bus is expected to save money over the lifetime of the vehicles because of reduced fuel and maintenance costs. The City is seeking to take advantage of low to no-cost programs and external financial assistance programs to help with these costs.

Funding opportunities for transit electrification include Federal/State grants, cross-sector partnerships (utility incentives), revolving loans (State Acquisition Finance Program), Green/Municipal bonds, and funds from the City Budget (Group Asset Purchasing Marketplace).

Equity Considerations

Transportation – whether by car or public transit – is often a significant expense for households. Transportation investments have historically reinforced patterns of inequality and exclusion by failing to provide clean, efficient, and affordable options for individuals travelling between urban

job hubs and surrounding sprawl. Electric vehicles offer a potentially clean mode of automobile transit but are currently sold at a much higher price than gas-powered cars. Additionally, the lack of adequate long-distance commute options disproportionately affects low-income individuals who cannot afford to live closer to their jobs. As a result, low-income populations have less access to clean mobility and higher mobility costs. Public transit options are available, but traditionally diesel-powered busses emit particulate matter associated with harmful health impacts. Affordable, clean bus transit can provide opportunity to bridge some of these economic and health inequalities.

Economic Development Considerations

The electric bus fleet will be charged using electricity from Monterey Bay Community Power (MBCP). Revenues from energy purchased from MBCP are retained for regional reinvestment. Therefore, money spent to fuel our transit fleet will be kept in the local economy rather than given to third party diesel providers.

Case Studies

- [Santa Monica Electric Fleet](#)
- [Grant helps Muni prepare facilities for electrified future](#)
- [Pittsburg School District Rolls Out New Electric Transit Style School Bus](#)
- [Electric Vehicles and the City of New Bedford, MA](#)
- [LeasePlan Issues \\$500M Green Bond to Fund Zero Emission Goal](#)
- [Municipal Fleet Electrification in Chula Vista, CA](#)
- [California City Adopts Zero-Emission Fleet Conversion Plan](#)

Tracking Progress

The City will report on implementation of the electrification strategic plan.



Connected 4.2 Shorten transit headways through accelerated implementation of the existing Short-Range Transit Plan.

Developing a multimodal transit network that encourages residents to use energy efficient transit options like the bus system are critical to reducing emissions in this sector. One of the challenges with encouraging people to adopt alternative forms of transportation is the level of access and convenience of the transit options. One way to address this is by increasing the headways of the existing bus transit system to halve the time it takes between bus arrivals.

Responsible Department – Public Works

Timeline

The recommendations in the City's adopted 2017-22 Short Range Transit plan already calls for double the current transit frequency (i.e. 20-30-minute headways) within the plan's planning horizon. There is a need for additional vehicles and operating financial assistance to enact these recommendations. Staff is engaging stake-holder groups and seeking grant assistance to help meet these goals.

GHG Reduction Estimates

This action is supportive of achieving the mode split target of transit accounting for seven percent of trips in the city by 2030, and 12 percent by 2035. If achieved, that mode split change is estimated to result in an annual reduction of 5,340 MTCO_{2e} in 2030 and 8,750 MTCO_{2e} in 2035.

Funding and Financing Options

Transit data suggest that no less than six additional transit vehicles are needed in service to achieve the greater headways. At an average of \$775,000 per electric bus, \$4,650,000 in one-time capital expenditures are needed. An additional \$1.8 million will also be needed in the annual transit operating budget to support ongoing operating costs.

Several external financial assistance and no-to-low cost program options are being identified in transit's Electric Vehicle Roll Out Plan. Transit agencies may tap into these to help overcome the initial hurdle of the purchase price and begin to make the transition to electric buses. Many of the options presented can be used in conjunction with one another to lower the overall costs.

Equity Considerations

Those who would benefit most from increased headways include non-car owning students and low-income community members who rely on transit to access housing, campus, centers of employment, and other necessary resources. Increases in transit frequency can contribute to a more reliable system overall and alleviate the need for car ownership.

Economic Development Considerations

A more reliable and frequent transit system will encourage ridership, notably to areas like downtown and other parking-restricted areas of commerce, which will help stimulate the local economy.

Tracking Progress

The City will report on annual transit system headways.

Connected 4.3 Explore additional innovative transit options in the 2022 Short-Range Transit Plan (e.g., on-demand deviated routes, electric fleet expansion, micro transit, Bus Rapid Transit, Transit Signal Priority, etc.).

The existing Short-Range Transit Plan is planned to be updated in 2022. In order to increase the capacity of the existing transit system while taking advantage of innovative, low-carbon options, the 2022 Short-Range Transit Plan will explore various innovative strategies to increase ridership, including on-demand deviated routes, electric fleet expansion, micro-transit, Bus Rapid Transit feasibility, and transit signal priority, etc.

Responsible Department – Public Works

Timeline

This action will be initiated and implemented in coordination with the 2021-23 Financial Plan.

GHG Reduction Estimates

This action is supportive of achieving the mode split target of transit accounting for seven percent of trips in the city by 2030, and 12 percent by 2035. If achieved, that mode split change is estimated to result in an annual reduction of 5,340 MTCO₂e in 2030 and 8,750 MTCO₂e in 2035.

Funding and Financing Options

Funding for this action will be sourced from the City’s Transit Fund.

Equity Considerations

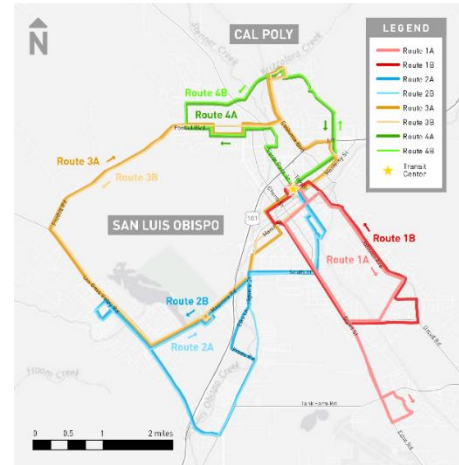
Expanding current options to include more innovative, low-carbon, low-cost modes in the 2022 Short-Range Transit Plan will allow for more opportunities for residents, community members, and visitors to utilize public transit services. With the introduction of on-demand deviated routes, bus rapid transit, and other options, those who rely on transit are able to use such services with more convenience to get from their homes to work and other areas around the City. Additionally, more innovative public transit will result in increased mobility of low-income community members and decrease the need for vehicle ownership.

Economic Development Considerations

External partnerships needed for various innovative transit options to be realized in San Luis Obispo creates vast opportunity for economic development through local and regional contracts and labor. Additionally, expanded transit options allows for enhanced access to downtown and other commerce centers for community members and visitors.

Tracking Progress

The City will report on action development and implementation progress through its inclusion in the 2021-23 Financial Plan.



Connected 4.4 Assess feasibility of a “free to the user” transit ridership program.

Cities throughout the world are currently assessing the viability of providing “free to the user” transit ridership. This program has taken different forms in different places and includes organizations pre-paying for their employees or members to ride in advance of their riding (similar to how Cal Poly pays in advance for student riders). The transit system requires certain levels of revenue to operate and in its assessment of the feasibility of this program, the City will carefully analyze potential financial system impacts and potential unintended consequences on service.

Responsible Department - Public Works

Timeline

The City will assess feasibility through 2020 and will include a discussion of potential rate options in the 2021-23 Financial Plan.

GHG Reduction Estimates

This action is supportive of achieving the mode split target of transit accounting for seven percent of trips in the city by 2030, and 12 percent by 2035. If achieved, that mode split change is estimated to result in an annual reduction of 5,340 MTCO_{2e} in 2030 and 8,750 MTCO_{2e} in 2035.

Funding and Financing Options:

Cost estimates as well as funding and financing options are forthcoming and will be identified in the feasibility analysis.

Equity Considerations

Eliminating the cost barrier to public transit would allow for the system to be used by all. This would have an especially positive impact on low-income community members and non-car owners who rely on transit to get from their homes to work, run errands, and engage socially.

Economic Development Considerations

Increased transit ridership as a result of free fare for users would enable visitors and community members to visit downtown and other commerce centers easily and frequently. Without having to consider the costs of gas or parking, access to these spaces will be significantly expanded.

Case Studies

- [CityLab – How Free Transit Works in the United States](#)
- [Natural So](#)
- [Chapel Hill, North Carolina Free Transit](#)
- [Sacramento Region to Launch Free Transit Pass for Youth](#)

Tracking Progress

The City will report annual transit rates and related programs.



Connected 5.1 Complete the 2019-21 Housing Major City Goal, including the Housing Element of the General Plan Update and Flexible Zoning Requirements for Downtown.

Active transportation and transit are important alternatives to single occupancy vehicles. However, even the best bicycle and transit systems in the world must be supported by land use and development patterns that allow people to live close to where they work and play. Underscoring the importance of housing on quality of life, affordability, and sustainability, housing is included as a Major City Goal in the 2019-21 Financial Plan. The work program for the Major City Goal includes updating the Housing Element of the General Plan and establishing flexible zoning requirements for downtown, both of which would make sustainable housing easier to build.



Responsible Department – Community Development

Timeline

The Major City Goal work program items are expected to be completed by June 2021.

GHG Reduction Estimates:

This action is supportive of achieving the mode split target of single occupancy vehicles only accounting for 50 percent of trips in the city by 2030 and 40 percent by 2035. If achieved, that mode split change is estimated to result in an annual reduction of 23,060 MTCO₂e in 2030 and 29,250 MTCO₂e in 2035.

Funding and Financing Options:

The Major City Goal work program funding is included in the 2019-21 Financial Plan.

Equity Considerations

Implementing the work program for the Housing Major City Goal, including the establishment for flexible zoning requirements downtown, creates a critical opportunity to bring more affordable housing to San Luis Obispo. Higher-density smaller units built downtown not only allows for more in-town employees to live close to work, it enables wider utilization of active transportation in place of car travel and other carbon-intensive, high cost modes.

Economic Development Considerations

Not only will the development of more housing—especially new units within and adjacent to downtown—create more jobs in building and construction, anchoring residents downtown near retail, restaurants, and other businesses will create more foot traffic in the main commerce corridor of San Luis Obispo and stimulate the local economy.

Tracking Progress

The City will report on action development and implementation progress via the standard Major City Goal progress report.

Connected 6.1 Develop and begin implementing electric mobility plan to achieve a goal of 40 percent electric vehicle miles traveled (VMT) by 2035.

In the 2017 Climate Change Scoping Plan, the State of California laid out aggressive electric vehicle targets, aiming to have 1.5 million electric vehicles on the road by 2025 and more than 4.2 million by 2030. While these numbers at one time seemed unreachable, rapid increases in investments by traditional and new automakers and rapidly declining prices for battery storage have led global analysts to predict rapid adoption of electric vehicles through the next decade.

Electrification of our community's transportation systems, coupled with decarbonization of the electrical grid, is the key to reducing and eventually eliminating greenhouse gas emissions from the state and City of San Luis Obispo's largest source. By developing and implementing an electric mobility plan, the City will be able to effectively blueprint the infrastructure, resources, and funding needed to promote and accommodate growth in electric transportation.

The most recent [electric vehicle outlook](#) published by Bloomberg NEF notes, "By 2040 we expect 57 percent of all passenger vehicle sales, and over 30 percent of the global passenger vehicle fleet, will be electric." In 2019, there were approximately [200,000 registered light duty vehicles and 67,000 trucks registered in San Luis Obispo County](#).

The success of this plan requires expansion of necessary infrastructure to support growth in local electric vehicles (EVs) and electric VMT. Recently, the City has taken significant regulatory steps to increase the community's capacity for EVs. Section 17.72.040 of The City of San Luis Obispo's Zoning Regulations details the minimum required number of EV ready and EV capable spots for new buildings. These new standards require substantially more publicly accessible chargers than the state building codes and will result in additional public investment in chargers throughout the community. Additionally, the City will continue to invest in public charging infrastructure. Implementation of this action will ensure that the infrastructure is focused in a strategic way to ensure maximum and equitable adoption of electric vehicles.

Responsible Department – Administration, Public Works, and Community Development

Timeline

This action will be initiated in 2020 and implemented beginning in 2021.



GHG Reduction Estimates

This action is supportive of increased electric vehicle usage and ownership by residents, commercial fleets, and by regional residents and business that travel to the city. Electric vehicle ownership is expected to reduce annual emissions by 22,180 MTCO₂e in 2030 and 34,920 in 2035.

Funding and Financing Options

Funding opportunities for the implementation of the electric mobility plan and installation of electric vehicle chargers around the City include California State Grants (Clean Transportation Fund, ARFVTP, and APCD), partnerships with major employers/institutions (MindBody, Cal Poly, and Charge Point), Green/Conduit Bonds (California iBank), Group Asset Purchasing Marketplaces (Sourcewell and Climate Mayors), and New Transport User Fees (SLO Public Works).

Equity Considerations

In their current state, most electric mobility options—especially electric vehicles—are not economically accessible. Costs associated with the purchase of an electric vehicle in addition to the time and financial resources needed for charging makes ownership infeasible for many low-income community members. The electric mobility plan will include a suite of policies and incentives that will allow for easier, more affordable access to different types of electric mobility and ensure that a robust network of electric vehicle infrastructure—including public charging stations—will be deployed so that lower-income community members have the tools they need as the market for electric vehicles expands and prices lower.

Economic Development Considerations

Expanding and promoting electric mobility within the City of San Luis Obispo will create many opportunities for external partnerships. By seeking out regional contracts and utilizing local labor, the City can bolster the development of this aspect of the green economy while ensuring maximized local benefit.

Case Studies

- [Fort Collins EV Readiness Roadmap](#)

Tracking Progress

The City will track and report total electric vehicles registered in the county, number of publicly available chargers in the city, and progress toward adoption of electrification strategic plan.



PILLAR 5: CIRCULAR ECONOMY

A “Circular Economy” is an economic system aimed at eliminating waste and the continual use of resources. Circular systems practice reuse, sharing, repair, refurbishment, remanufacturing and recycling to create a closed-loop system, minimizing the use of resource inputs and the creation of waste, pollution and carbon emissions. Whereas, a traditional extractive economy can be thought of as a straight line from extraction to consumption to disposal, a circular economy looks to use 'waste' as 'food' for other processes.

Circular Economy Goals:

75 percent diversion of landfilled organic waste by 2025; 90 percent diversion by 2035

Total Emissions Reductions in 2030:

37,410 MTCO₂e

Total Emissions Reductions in 2035:

47,300 MTCO₂e

One example of this is organic waste that had traditionally been sent to a landfill. In 2016, Greenhouse gas emissions from organic material decomposing in Cold Canyon Landfill account for over ten percent of the community’s greenhouse gas emissions. As organic materials decompose in a landfill, they release methane, a powerful greenhouse gas. Although Cold Canyon Landfill includes methane capture provisions, methane capture is a challenge at landfills because of the natural movement of the Earth’s surface beneath the tarped waste. As a result, methane can escape into the atmosphere over time. By first reducing the amount of organics being disposed of through edible food rescue, and then focusing efforts on diversion of landfilled organics to the regional anaerobic digester, the City will be providing access to food for those in need and will also be fully capturing methane and converting it to biogas via the regional anerobic digester. The outputs of the anerobic digester are clean electricity and high-quality compost, both of which can be delivered back to the community.

The foundational actions in this pillar focus on the area the City has direct responsibility for: diversion of organic waste from the landfill and achieving the methane reductions required by California’s recently adopted Short-lived Climate Pollutants law (SB 1383).

Emissions from organic waste are only a portion of the overall greenhouse gas emissions that occur as the result of consumption: single use plastics, product shipping, and emissions intensive diets all create greenhouse gas emissions and are emerging topics in the field of climate action planning. A move to a more circular economy, where goods and materials are created in the region, consumed in the region, and reused in the region would grow local and regional wealth, reduce emissions and would also indirectly resolve lifecycle emissions issues. However, these topics sit outside the traditional fields the City engages in and will require substantial time and resource investments from community groups, businesses, and partners to achieve. The City will

monitor regional activities in this space and will consider including more detailed information on these additional topics in the 2022 Climate Action Plan.

City Leadership

The City has exhibited leadership by working with IWMA to implement, publicize and support the development of one of the only anaerobic digesters in the nation. This already achieved foundational action allows the community's green waste to create clean electricity and high-quality compost which is returned to the community.

Foundational Actions

The foundational actions for this pillar are:

- Circular Economy 1.1 – Adopt an ordinance requiring organic waste subscription for all residential and commercial customers by 2022.
- Circular Economy 1.2 – Develop and implement programs to increase edible food rescue by 20 percent.
- Circular Economy 1.3 – Develop and implement a waste stream education program for HOA/Property Managers and the commercial sector.
- Circular Economy 2.1 – Update the Municipal Code solid waste section and bin enclosure standards.
- Circular Economy 2.2 – Develop and expand funding for a Solid Waste section in the Utilities Department.



Circular Economy 1.1 Adopt an ordinance requiring organic waste subscription for all residential and commercial customers by 2022.

The City will require all residential and commercial customers to subscribe to organic waste service by 2022. In San Luis Obispo, solid waste processing and disposal generates more greenhouse gas emissions than residential energy use. When organic waste decomposes in a landfill, it emits methane (CH₄), a powerful greenhouse gas more than 30 times as potent as carbon dioxide (CO₂). By diverting these materials to the local anaerobic digester, these organic materials are recycled into valuable soil amendments or safely burned to create energy (biofuel). The City currently offers businesses and residents optional weekly organic waste collection for disposal at the large anaerobic digester near the San Luis Obispo Airport. The ordinance would require that all businesses and residents opt-in to the service by 2022.

Responsible Department Utilities

Timeline

The City will adopt an ordinance requiring organic waste subscription for all residents and businesses by 2022.

GHG Reduction Estimates

This action is supportive of large-scale diversion of organic waste that could repurposed into high-quality compost through the City's anaerobic digester in place of contributing to landfilled greenhouse gas emissions. An ordinance requiring organic waste subscription is expected to reduce annual emissions by 37,410 MTCO_{2e} in 2030 and 47,300 MTCO_{2e} in 2035.

Funding and Financing Options

There will be no additional funding or financing required for ordinance adoption, however, for the franchised hauler to accommodate a major increase in the organic customer base, solid waste service rates are likely to increase.

Equity Considerations

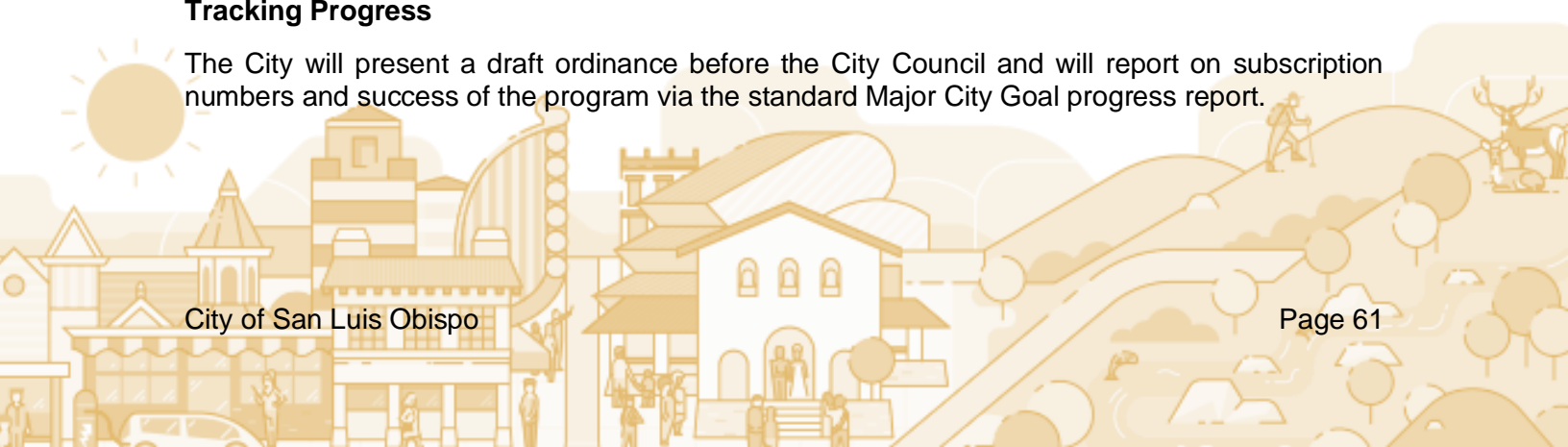
City-wide mandatory organic waste pickup will ensure that residential and commercial customers alike will have equal opportunity to reduce their GHG emissions through diversion of methane-producing organics from the landfill. Additionally, the City plans to work with IWMA to identify, consider, and mitigate as feasible the financial impacts of potential rate increases on low-income customers.

Case Studies

- [Seattle Public Utilities](#)
- [San Francisco Zero Waste](#)
- [Portland Garbage, Recycling and Composting](#)

Tracking Progress

The City will present a draft ordinance before the City Council and will report on subscription numbers and success of the program via the standard Major City Goal progress report.



Circular Economy 1.2 Develop and implement program to increase edible food rescue by 20%.

In compliance with California SB 1383 as codified in California Government Code 42652.5.(a).2, the City will support programs to ensure that at least 20 percent of currently disposed edible food is recovered for human consumption by 2025. Most grocery stores, farms, restaurants and other dining facilities are unable to sell food past its “sell-by” date, even if the food is edible and in good condition. Food recovery diverts this otherwise wasted food to local emergency food programs. The City will partner with the Integrated Waste Management Authority, local food banks, and the SLO County Food System Coalition to achieve program expansion.



Responsible Department – Utilities

Timeline

The development and implementation of the edible food rescue programs will be performed in collaboration with existing efforts by the IWMA. In 2020, the focus will be on establishing data with focus on an overall 20% increase in food rescue by 2025.

GHG Reduction Estimates

This action is supportive of large-scale diversion of organic waste through intercepting and redistributing edible food before it becomes otherwise landfilled waste. Developing and implementing an edible food rescue program is expected to reduce annual emissions by 37,410 MTCO₂e in 2030 and 47,300 MTCO₂e in 2035.

Funding and Financing Options

Funding needs will be assessed in year 2020 when establishing baseline data and potential costs. The food banks will be a primary resource for distributing rescued edible foods, and a potential increase in services may require additional funding.

Equity Considerations

Food rescue programs provide food at low- or no-cost to food insecure families and individuals.

Economic Development Considerations

Increased food rescue could help to reduce the number of food insecure households in San Luis Obispo. When adults have consistent access to healthy food, their work ability and productivity can increase, and healthcare bills can decrease. Additionally, food insecurity in children can hinder physical development and the ability to learn – impacts that can last into adulthood and potentially affect future participation in the workforce.

Tracking Progress

The City will report on action development and implementation progress via the standard Major City Goal progress report.

Circular Economy 1.3 Develop and implement a waste stream education program for HOA/Property Managers and the commercial sector.

The City will develop and implement a program to inform the public on how to properly dispose of waste locally. Clear and easily accessible public information about the waste stream – what items should go in the trash, recycling and organic waste bins, or other special facilities such as the e-waste facility and construction and demolition recycling facility – can help increase landfill diversion and prevent contamination of each waste stream. The IWMA has an existing outreach program for local businesses, and the City will partner with, and expand on, an education program for the City’s Homeowners Associations, property managers, and commercial businesses. The City will partner with the Integrated Waste Management Authority to ensure successful implementation.

Responsible Department – Utilities

Timeline

The City will work with the IWMA in building an HOA/property manager waste stream education program in January of 2021, a year before requiring all commercial and residential solid waste customers to enlist in organics service. Once established, outreach and educational campaigns will be sent out to the community at least annually to help manage the influx of new tenants.

GHG Reduction Estimates

This measure in itself will not reduce greenhouse gas emissions, but promotion of zero waste practices and education around organic waste diversion have potential to reduce the City’s greenhouse gas emissions by reducing waste sent to the landfill.

Funding and Financing Options

The duties of outreach and education fall under the scope of work of the Solid Waste & Recycling Coordinator in the Utilities Department. There should be no additional costs.

Equity Considerations

It will be critical to ensure that the waste stream education program is digestible and accessible to all residents. The program should have both audio and visual formats and be produced in both English and Spanish.

Economic Development Considerations

Improved waste stream education can increase the amount of waste diverted from the landfill to recycling and composting centers. Finding alternatives to landfilling material contributes to added longevity of the landfill, postponed expansion, and ultimately a cost savings, buying time to find permanent alternatives to burying and landfilling waste. Additionally, recycling and composting facilities create jobs and the sale of recycled materials and compost can bring money into the local economy.

Tracking Progress

The City will report on the number and nature of meetings with each utility in the first year of implementation.



Circular Economy 2.1 Update the Municipal Code solid waste section and bin enclosure standards.

The City will update the Municipal Code solid waste section and bin enclosure development standards to support organics composting for all residents and ensure that adequate space is created for organic waste bins at all residential and commercial properties. The solid waste sections of the Municipal Code benefit the San Luis Obispo community by supporting waste reduction and diversion of recyclables from our local landfill, preserving the beauty of our neighborhoods through waste disposal requirements, and making sure residents receive solid waste services in a timely and regular manner. By using the City's updated waste bin enclosure standards which will reflect capacity design for all three waste streams, developers create opportunity for future tenants to dispose of their waste in accordance with local and state law. Updates to the City Municipal Code and bin enclosure development standards are necessary to best support the newly established goals of the City Council and of the State of California. Once these guiding documents are updated and published, the City will promote and educate community members on best methods of compliance.

Responsible Department – Utilities

Timeline

Municipal Code and bin enclosure standard updates will be presented by December 2020

GHG Reduction Estimates

This measure in itself will not reduce greenhouse gas emissions, but promotion of zero waste practices and education around organic waste diversion have potential to reduce the City's greenhouse gas emissions by reducing waste sent to the landfill.

Funding and Financing Options

Municipal Code and bin enclosure standard updates will fall under the scope of the City's Solid Waste & Recycling Coordinator, funded by AB939 fees and supplemented with general fund monies.

Equity Considerations

Many residential and commercial properties currently cannot accommodate bins, which inhibits users' ability to practice responsible and informed disposal. All residents and community members will be able to contribute to the diversion of organic waste and recyclable materials without worrying about individual buy-in by property owners and managers.

Economic Development Considerations

Updated bin enclosure standards and Municipal Code sections will improve public cleanliness for citizens and visitors of the City of San Luis Obispo. Additionally, preventing contamination (of one waste stream by another waste stream's materials) through adequate accommodation for all three streams may reduce sorting costs and therefore help manage rates.

Tracking Progress

The City will report on action development and implementation progress via the standard Major City Goal progress report.

Circular Economy 2.2 Develop a Solid Waste section in the Utilities Department.

The City's Utilities Department will develop a section exclusively focused on solid waste. This focused effort will enable the City to better manage and regulate solid waste disposal practices in the City, to ensure rates are equitable and reflect the cost of service community members receive, to manage contracts and compliance with franchised haulers, to promote overall reduction of waste, to provide resources to residents, and as a result, to reduce greenhouse gas emissions. The Solid Waste section will oversee all recycling, landfilled waste, organic waste, and zero waste programs.



Responsible Department – Utilities

Timeline

The Solid Waste program plan will be established by July 2020.

GHG Reduction Estimates

This measure in itself will not reduce greenhouse gas emissions, but promotion of zero waste practices and education around organic waste diversion have potential to reduce the City's greenhouse gas emissions by reducing waste sent to the landfill.

Funding and Financing Options

The Solid Waste section is currently funded by existing fees collected for the purpose of recycling and diversion related programs. Supplemental funding may be required for expansion of the program.

Equity Considerations

The City will take action to ensure that the creation of this section will not impact residents' and property owners' solid waste collection fees.

Economic Development Considerations

The establishment and eventual expansion of the Solid Waste section of the City's Utilities Department has the potential to create a number of local jobs.

Case Studies

- [San Francisco Solid Waste Program](#)
- [Curb It – Boise's trash, recycling, compost and other solid waste program](#)
- [County of Marin Waste Management Division](#)

Tracking Progress

The City will report on action development and implementation progress via the standard Major City Goal progress report.

PILLAR 6: NATURAL SOLUTIONS

The City's Greenbelt and Urban Forest provide valuable benefits to the community, including the conservation of natural resources and maintenance of ecosystem services, nearby access to passive recreation opportunities, compact urban form, climate resilience benefits, and storing carbon in the soil.

Peer-reviewed research indicates substantial carbon sequestration can accrue in grassland systems with compost application¹⁴ and emerging research suggests even more significant results may be achieved through regenerative farming practices.

Natural Solutions Goal:

Increase carbon sequestration on the San Luis Obispo Greenbelt and Urban Forest through compost application-based carbon farming activities and tree planting; ongoing through 2035

Total Emissions Reductions in 2030:
3,610 MTCO_{2e}

Total Emissions Reductions in 2035:
7,050 MTCO_{2e}

Emissions Sector Addressed

A Carbon Farm Plan will be developed for the City's Johnson Ranch Open Space and Calle Joaquin Agricultural Reserve ("City Farm") in 2021, with pilot implementation of compost application and monitoring conducted beginning in 2022. Following this initial period, it is anticipated that an additional 100 acres per year could receive compost applications on lands within the San Luis Obispo Greenbelt through partnerships with local farmers and ranchers. The modeled cumulative effect of this action sequesters 33,000 MTCO_{2e} by 2035.

A group of local citizens have also approached the City with an ambitious tree planting campaign, preliminarily being called 10 Tall: An Initiative to Plant 10,000 Trees in San Luis Obispo by 2035. While some of these trees can be planted in existing vacant tree wells and City parks, the vast majority would need to be low-cost, one gallon starts of native trees to be planted in City open space properties and other natural or rangeland areas. An ambitious tree planting program of this size would need to rely on substantial partnerships and resources. The modeled cumulative effect of this action sequesters 24,000 MTCO_{2e} by 2035. Several key unknowns exist including a

¹⁴ Silver, Whendee, Sintana Vergara, Allegra Mayer. (University of California, Berkeley). 2018. Carbon Sequestration and Greenhouse Gas Mitigation Potential of Composting and Soil Amendments on California's Rangelands. California's Fourth Climate Change Assessment, California Natural Resources Agency. Publication number: CCCA4-CNRA2018-002.

standard protocol for accounting for emissions already sequestered or emitted from the City's urban forest or open spaces, the effectiveness of sequestration practices in the climatic and soil conditions present in and around the city, and protocol for accounting for emissions savings that occur outside of city limits. In future Climate Action Plan updates, the City could choose to include emissions sectors for natural systems in the greenhouse gas emissions inventory and account for existing carbon stocks through land conservation and negative emissions associated with carbon farming and tree planting.

Equity, Quality of Life, and Economic Development Opportunities

The City's Greenbelt Protection Program is typically identified by residents as a top priority. This system of protected natural resources and conserved landscapes is central to maintaining the City's identity and unique sense of place. Over 50 miles of trails are available to all and provide access to no-cost passive recreation. Urban forests, green space, and open space have well documented mental health benefits and property value benefits. In addition to carbon sequestration, the City's Greenbelt and Urban Forest provide tremendous climate resilience benefits including shading and cooling, stormwater management and watershed protection, and buffering from catastrophic flooding and wildfires. The operation and maintenance of these programs supports jobs, enhances property values, and results in economic multiplier effects across numerous sectors. Carbon farming activities also support local farmers and ranchers and the agricultural economy.

City Leadership

The City has been participating in national and international carbon sequestration working groups through the Urban Sustainability Directors Network (USDN) and the Carbon Neutral Cities Alliance (CNCA). The City looks to be at the forefront of research to better understand how to manage healthy natural resources in a changing climate while also removing climate pollution from the atmosphere and storing it in the soil. The City's next leadership steps are to participate in a forthcoming USDN Innovation Fund grant in partnership with numerous other leading cities.

Foundational Actions

The foundational actions of this pillar are:

- Natural Solutions 1.1 – Conduct Carbon Farming Study and Pilot Project in 2021. If feasible, begin implementation by 2023.
- Natural Solutions 2.1 – Prepare the City's first Urban Forest Master Plan by 2021 and plant and maintain 10,000 new trees by 2035.



Natural Solutions 1.1 – Conduct Carbon Farming Study and Pilot Project in 2021 and if feasible, begin implementation by 2023.

A Carbon Farm Plan will be developed for the City’s Johnson Ranch Open Space and Calle Joaquin Agricultural Reserve (“City Farm”) in 2021 with pilot implementation of compost application and monitoring conducted beginning in 2022. Following this initial period, it is anticipated that an additional 100 acres per year could receive compost applications on lands within the San Luis Obispo Greenbelt through partnerships with local farmers and ranchers.



Responsible Department – Administration

Timeline

The Carbon Farming Study and Pilot Project will start in 2021 and, if feasible, long-term implementation will begin in 2023.

GHG Sequestration Estimates

Carbon farming activities based on the timeline and objectives outlined, above, have been modeled to reduce annual emissions by 5,560 MTCO_{2e} in 2035.

Funding and Financing Options

Funding for the preliminary Carbon Farming Study and Pilot Project are currently deferred due to the economic impacts resulting from COVID-19. However, the City will also pursue a demonstration project grant through the [Healthy Soils Program](#) administered by the California Department of Food and Agriculture (CDFA) to build additional capacity and resources when this program is next available. Other state and federal funding opportunities are also available that the City will pursue [e.g. Natural Resources Conservation Service (NRCS)]

Equity Considerations

Johnson Ranch Open Space and the Calle Joaquin Agricultural Reserve (locally known as “City Farm”) are both a part of City’s Greenbelt Protection Program. This system of protected natural resources and conserved landscapes is central to maintaining the City’s identity and unique sense of place and access is provided at no-cost. The non-profit partner City Farm SLO is providing sustainable agricultural education for all ages, with special focus on continuing education high school students, while also producing healthy and nutrient dense local food. In addition to carbon sequestration, the City’s Greenbelt provides tremendous climate resilience benefits including shading and cooling, stormwater management and watershed protection, as well as buffering from extreme heat events, catastrophic flooding, and wildfires.

Economic Development Considerations

The operation and maintenance of carbon farming and regenerative agriculture supports jobs, enhances property values, and results in economic multiplier effects across numerous sectors. Over the long-term, carbon farming activities will also support local farmers and ranchers and the agricultural economy through with public-private partnerships and increased agricultural productivity.

Case Studies

- [Marin Carbon Project](#)
- [Urban Drawdown Initiative](#)
- [Coastal San Luis](#) and [Cachuma](#) Resource Conservation Districts

Tracking Progress

The Carbon Farm Plan will include and identify monitoring and tracking methods. The monitoring plan will be based on established state adopted protocols for monitoring soil health indicators and may be adapted to meet requirements identified by additional funding sources (i.e. CDFA Healthy Soils Demonstration funds). Over the long-term, it is anticipated that the resource conditions that will be evaluated are as follows:

Johnson Ranch Open Space

Rangeland Management

Carbon Sink + Sequestration

Soil Health

Vegetation Communities & Rare Plants

Wildlife Habitat

Riparian Function

Water Quality

Public Access - Trails

City Farm

Crop Management

Carbon Sink + Sequestration

Soil Health

Food Nutrient Density

Wildlife Habitat

Riparian Function

Water Quality

Public Access – Educational Programming



Natural Solutions 2.1 – Prepare the City’s first Urban Forest Master Plan by 2021 and plant and maintain 10,000 new trees by 2035.

The City will prepare its first Urban Forest Master Plan that updates the existing tree inventory and identifies future tree planting opportunities with climate-ready tree species, as well as strategies for ongoing operations and maintenance. The



Urban Forest Master Plan will also include a feasibility study to propose and assess an ambitious tree planting campaign called *10 Tall: An Initiative to Plant 10,000 Trees in San Luis Obispo by 2035*. While some of these new trees can be planted in existing vacant tree wells and City parks, the vast majority would need to be low-cost, one-gallon container stock of native trees to be planted in City open space properties as well as creeks and riparian areas. Trees that are planted in creeks and riparian areas grow rapidly and sequester carbon at higher rates, while also providing valued habitat, water quality protection, and erosion control. An ambitious tree planting program of this size will need to rely on substantial community partnerships and external resources.

Responsible Department – Administration and Public Works

Timeline

The Urban Forest Master Plan will be completed by the end of 2021. Tree planting and maintenance are ongoing on an annual basis.

GHG Reduction Estimates

Tree planting activities based on the timeline and objectives outlined, above, have been modeled to reduce annual emissions by 1,490 MTCO_{2e} in 2035.

Funding and Financing Options

Funding for the Urban Forest Master Plan effort is currently deferred due to the economic impacts resulting from COVID-19. However, the City’s long-standing community partner, ECOSLO, is currently implementing a California ReLeaf grant for tree planting in the City in the amount of \$24,000 and is also a partner in a \$1,000,000 grant that includes a significant tree planting component. Additional grant funding opportunities are anticipated through Cal Fire and the Urban Greening Grant Program administered through the California Natural Resources Agency. Numerous grants also exist that can support creek restoration and riparian habitat enhancement. It is anticipated that working with community partners to activate volunteer networks for tree planting implementation could result in local business sponsorships and participation, as well as revenue through “gift tree” donations.

Equity Considerations

As the climate continues to change, the state, region, and City of San Luis Obispo face increased risks, including extreme heat days and floods. Those most vulnerable to such changes notably include low-income and transient community members. The City’s Urban Forest provide tremendous climate resilience benefits including shading and cooling, stormwater management and watershed protection, and documented mental health benefits.

Economic Development Considerations

The City's Urban Forest provides overall beautification of the city and documented property value enhancement benefits. Urban Forestry provides local jobs and business opportunities such as tree nurseries and reclaimed lumber for furniture and landscaping. As street trees grow larger, their shading and cooling effects have a measurable effect of reducing costs associated with air conditioning use in buildings.

Case Studies

- [City of Davis – Community Forest Management Plan](#)
- [City of Santa Monica – Urban Forest Master Plan](#)
- [Portland Friends of Trees](#)

Tracking Progress

The City will track street trees planted in the urban environment using its tree inventory database software (ArborPro™ or similar) and ensure that these trees receive periodic care and maintenance on a rotating basis and as emergency needs arise. Native trees planted in City open space or within creek and riparian environments can also be tracked using a tree inventory database based on tree planting events and occurrences and the total number of trees planted on those occasions. Grant funding opportunities that support tree planting typically carry monitoring and tracking requirements, as well as specific success criteria for tree survival and other benefits accrued.





4. ACHIEVING OUR GOALS

Administrative Actions

In addition to the foundational actions listed in Chapter 5, this Chapter includes a number of actions required by City staff to ensure the Climate Action Plan is being implemented, that implementation of the Climate Action Plan is effective, and that lessons learned along the way are being recorded in support of regular Climate Action Plan updates.

Administrative Action 1 – Implement Climate Action Plan with an Equity Lens

The City commits to implementing the Climate Action Plan with an equity lens. Staff will continue to learn best practices and evolve and grow over time. As an initial commitment, every action implemented in the CAP that requires an internal project plan will also include an assessment of equity that includes a detailed description of how the project will incorporate:

- Representational equity – a focus on having diverse voices guide the project’s definition and implementation.
- Distributional equity – a focus on the costs and benefits of a project and how they are distributed to different demographics in the community.
- Generational equity - a focus on the costs and benefits of a project and how they are distributed to different demographics over time.
- Structural equity – a focus on how the project creates systems that reinforce representational, distributional, and generational equity after the project has been implemented.

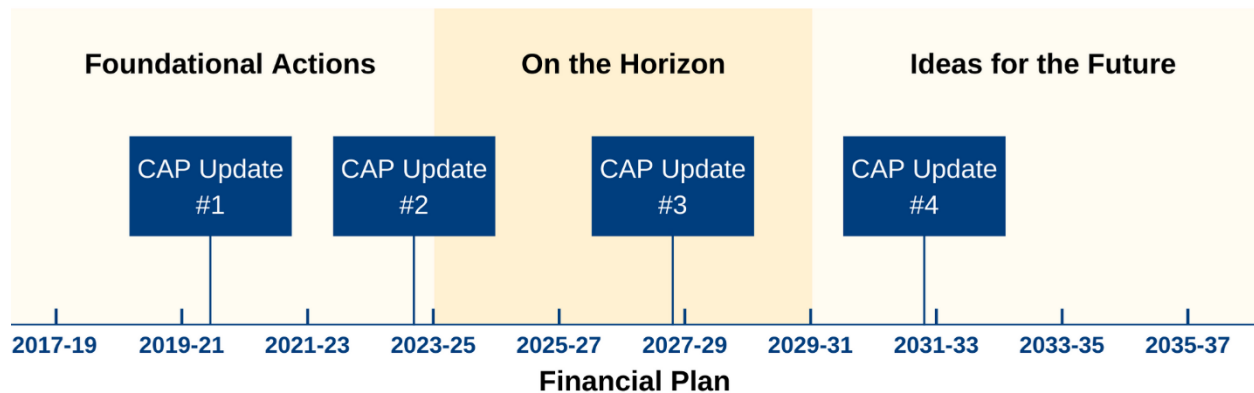
Administrative Action 2 – Monitor and Report Plan Implementation

Using the “Tracking Progress” metrics provided in Chapter 3 and the work program provided in this Chapter, the City will develop a greenhouse gas emissions inventory update in every odd year and will develop a monitoring and reporting protocol and provide an update to City Council on progress every other year starting in the Summer of 2022. Consistent with Administrative Action 1, the City will also identify an approach to evaluate and report equity metrics related to Climate Action Plan implementation.

Administrative Action 3 – Regularly Update the Climate Action Plan

The City will update the Climate Action Plan for adoption in the Fall prior to every other Financial Plan. This allows for certainty in the update schedule, ensures that carbon neutrality work is directly tied to the City’s financial decision making and prioritization process, and allows for constant integration of learning and best practices into the City’s climate action program. The proposed update schedule is provided as Figure 4.1.

Figure 4.1. Climate Action Plan Update Schedule



Administrative Action 4 – Ensure Transparency by Reporting Greenhouse Gas and Climate Action Information to Public Disclosure Programs

Several state, national, and international disclosure platforms exist with the purpose of providing transparency and access to sustainability related information. The City will review available programs, such as the Carbon Disclosure Program and SEEC Clear Path, and report on the platforms that have no or minimal costs to participate in.

Administrative Action 5 – Develop Mitigation Program for New Development to Illustrate Consistency with the Climate Action Plan

The City will coordinate with the San Luis Obispo Air Pollution Control District, 3C-REN, and regional resource conservation districts to identify and evaluate possible local and regional offset mitigation projects for new development to use to illustrate consistency with this Climate Action Plan.

Staff Work Program

Table 4.1, referred to as the “Staff Work Program” summarizes the foundational actions and administrative actions provided in Chapter 2 and 3. The Staff Work Program is intended to be used for assigning tasks to City staff, as well as for monitoring implementation progress. The table also exists as part of a Microsoft Excel based monitoring tool that will be used to provide updates to City Council on a biennial basis.

Table 4.1 Staff Work Program

Foundational Action	Action Description	Responsible Department	Budgeted?	Action Start Date	Action Progress Tracker
Lead by Example 1.1	Adopt a municipal carbon neutrality plan in 2021	Administration	Yes, On Hold	2020, Q4	Plan development and implementation progress
Lead by Example 2.1	Include carbon neutrality, social equity, and a focus on developing a green local economy in the updated Economic Development Strategic Plan	Administration	No	2021, Q1	Plan development and implementation progress
Lead by Example 3.1	Research methods to support local contractors and labor	Administration	No	2021, Q3	Completed research progress; inclusion in 2023 Climate Action Plan
Lead by Example 4.1	Create a formal approach to support and empower community collaboration for climate action	Administration	No	2021, Q3	Number of organizations formally acknowledged
Energy 1.1	Launch Monterey Bay Community Power and achieve a 98% participation rate while advocating for programs that support equity and achieve maximum local benefit	Community Development	Yes	2020, Q1	MBCP electricity emissions coefficient; MBCP opt-out rate
Energy 2.1	Work with MBCP and PG&E to develop a regional grid reliability strategy	Administration	Yes	2020, Q1	Number of meetings with each utility
Energy 3.1	Partner with SoCal Gas to research options for reducing greenhouse gas emissions associated with the existing natural gas grid	Administration	Yes	2021, Q1	Number of meetings with each utility
Buildings 1.1	Adopt and implement the Clean Energy Choice Program for New Buildings and review opportunities for improvement in the 2022 code cycle	Administration, Community Development	Yes	2020, Q3	Number and type of permits for all-electric and mixed-fuel buildings
Buildings 2.1	Conduct comprehensive retrofit program study and develop and implement a strategic and equity focused building retrofit program by 2021	Administration, Community Development	Yes	2020, Q3	Plan development; permits
Connected 1.1	Establish a consistent method for tracking and reporting mode split metrics	Public Works	No	2021, Q1	Plan development and implementation progress; inclusion in the 2021-23 Financial Plan
Connected 1.2	Research and develop an approach to a “Mobility as a Service” platform for people to easily use all modes of low carbon mobility in the City	Administration, Public Works	No	2021, Q1	Plan development and implementation progress; inclusion in the 2021-23 Financial Plan
Connected 2.1	Complete Active Transportation plan and begin implementation immediately	Public Works	Yes	2020, Q1	Plan development and implementation progress
Connected 2.2	Launch micro mobility program by 2021	Public Works	Yes	2020, Q3	Program launch; ridership and utilization metrics

Foundational Action	Action Description	Responsible Department	Budgeted?	Action Start Date	Action Progress Tracker
Connected 3.1	Establish a policy and strategic approach to leveraging existing and new parking garages for downtown residential and visitor serving uses and to allow for further implementation of the Downtown Concept Plan	Administration, Public Works	No	2020, Q3	Number of internal meetings
Connected 4.1	Develop transit electrification strategic plan and begin implementing in 2020	Public Works, Administration	Yes	2020, Q3	Implementation of the electrification strategic plan
Connected 4.2	Shorten transit headways through accelerated implementation of the existing Short-Range Transit Plan	Public Works	Yes	2020, Q1	Annual transit system headways
Connected 4.3	Explore additional innovative transit options in the 2022 Short-Range Transit Plan (e.g., on-demand deviated routes, electric fleet expansion, micro transit, Bus Rapid Transit, Transit Signal Priority)	Public Works	No	2021, Q1	Plan development and implementation progress; inclusion in the 2021-23 Financial Plan
Connected 4.4	Assess feasibility of a “free to the user” transit ridership program	Administration, Public Works	Yes	2020, Q3	Annual transit rates and related programs
Connected 5.1	Complete the 2019-21 Housing Element of the General Plan Update and Flexible Zoning Requirements for Downtown	Community Development	Yes	2020, Q3	Major City Goal progress report
Connected 6.1	Develop and begin implementing electric mobility plan to achieve a goal of 40 percent electric vehicle miles traveled (VMT) by 2035	Administration, Public Works	Yes	2020, Q3	Total number of electric vehicles registered in the county and publicly available chargers in the city; implementation of the electrification strategic plan
Circular Economy 1.1	Adopt an ordinance requiring organic waste subscription for all residential and commercial customers by 2022	Utilities	No	2022, Q1	Ordinance; Major City Goal progress report
Circular Economy 1.2	Develop and implement program to increase edible food rescue by 20 percent	Utilities	No	2020, Q3	Major City Goal progress report
Circular Economy 1.3	Develop and implement a waste stream education program for HOA/Property Managers and the commercial sector	Utilities	Yes	2021, Q1	Number of meetings with each utility
Circular Economy 2.1	Update the Municipal Code solid waste section and bin enclosure standards	Utilities	Yes	2021, Q1	Major City Goal progress report
Circular Economy 2.2	Develop and expand funding for a Solid Waste section in the Utilities Department	Utilities	Yes	2020, Q3	Major City Goal progress report

Foundational Action	Action Description	Responsible Department	Budgeted?	Action Start Date	Action Progress Tracker
Natural Solutions 1.1	Conduct Carbon Farming Study and Pilot Project in 2021. If feasible, begin implementation by 2023	Administration	No	2021, Q4	Monitoring and tracking methods will be identified in the Carbon Farm Plan (forthcoming)
Natural Solutions 2.1	Prepare the City's first Urban Forest Master Plan by 2021 and plant and maintain 10,000 new trees by 2035	Administration, Public Works	No	2021, Q1	Tree inventory database software
Administrative Action 1	Implement Climate Action Plan with an Equity Lens	All Departments	No	Ongoing	Inclusion of equity lens in implementation project plans.
Administrative Action 2	Monitor and Report Plan Implementation	Administration, All Departments	No	2021, Q2	GHG emissions inventory update annually; City Council update every other year
Administrative Action 3	Regularly Update the Climate Action Plan	Administration	No	2022, Q2	Inclusion in the 2021-23 Financial Plan
Administrative Action 4	Ensure Transparency by Reporting Greenhouse Gas and Climate Action Information to Public Disclosure Programs	Administration	No	2020, Q3	State, national, and international disclosure platforms
Administrative Action 5	– Develop Mitigation Program for New Development to Illustrate Consistency with the Climate Action Plan	Community Development, Administration	No	2021, Q2	Tracking Progress metrics



CITY OF SAN LUIS OBISPO



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CLIMATE ACTION PLAN

Appendix A: Greenhouse Gas Emissions Inventory and Forecast

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1. INTRODUCTION

A greenhouse gas (GHG) inventory is a comprehensive measure of GHG emissions that have occurred as the result of activity in a jurisdiction or a geographic area in a calendar year. It is common to prepare two separate GHG inventories, one for local government operations only and the other for community-wide emissions. Though inventories are custom to their jurisdiction, local government GHG inventories typically include the accounting of emissions from the buildings, facilities, and vehicles operated by a local government, while community-wide inventories typically include accounting of emissions from all businesses, residents, and transportation within the jurisdictional boundary.

This report focuses on community-wide GHG emissions. Section 1 of this report provides an overview of the community GHG emissions inventories and forecasts. Sections 2-5 provide detailed summaries of the inventoried GHG emissions sectors. Section 6 provides a detailed description of the GHG forecasts and a discussion of the City's progress toward its GHG reduction targets. Section 7 concludes the report with a description of areas for improvement.

1.1 Community GHG Inventory Overview

In 2012, the City of San Luis Obispo (City) adopted the City of San Luis Obispo Climate Action Plan (CAP) to achieve GHG emission reductions consistent with state law and City General Plan policy. The foundation of the CAP is the 2005 baseline GHG inventory (completed in 2009), which estimates the GHG emissions that occurred as the result of activity in the city.

In the 2017 California Climate Change Scoping Plan, the California Air Resources Board notes, "In developing local plans, local governments should refer to 'The U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions' (community protocol), which provides detailed guidance on completing a GHG emissions inventory at the community scale in the United States – including emissions from businesses, residents, and transportation." The City prepared a 2016 comprehensive community-wide and local government GHG emissions inventory update compliant with all relevant protocols and guidance documents including the U.S. Community Protocol, [Local Government Operations Protocol \(LGOP\)](#), the [Global Protocol for Community Scale GHG Emissions \(GPC\)](#), and the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National GHG Inventories. The community-wide GHG inventory is the foundation for the Climate Action Plan Update, which is expected to be adopted in 2020.

In the 2017 Scoping Plan, the California Air Resources Board directs local governments to the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. The Community Protocol includes required emissions sectors that must be inventoried including use of electricity, onsite fuel combustion (i.e., natural gas), energy used for water conveyance and treatment, use of on-road vehicles, and generation of solid-waste.¹ This report presents a

¹ The electricity and natural gas sectors of the City's GHG inventory include energy used to convey and treat water.

summary of the updated 2005 GHG emissions and details the 2016 community GHG inventory completed in 2018 and revised in 2019.²

Greenhouse gas emissions are not measured directly. They are modeled and estimated by multiplying data about some activity (e.g., the amount of electricity consumed, the number of miles travelled in fossil fuel powered vehicles, the tons of solid waste sent to the landfill, etc.) by the greenhouse gas emission content of a typical unit of that activity (e.g., the average greenhouse gas emissions content per therm of combusted natural gas). This inventory accounts for three common greenhouse gasses: carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Since methane and nitrous oxide are substantially more potent greenhouse gases than carbon dioxide (86 and 265 times more potent, respectively), the emissions modeled from their release into the atmosphere are multiplied by their respective potential to warm the atmosphere relative to CO₂. The common reporting unit for greenhouse gas emissions is “Metric Tons of Carbon Dioxide Equivalence”, or MTCO₂e.

1.2 2005 Community GHG Inventory

In 2009, the community’s total 2005 baseline GHG emissions were estimated to be 264,237 metric tons of carbon dioxide equivalent (MTCO₂e). The inventory included energy (residential and nonresidential), transportation, and waste sectors. Of the three sectors, transportation contributed the largest amount of GHG emissions with estimated emissions of 132,142 MTCO₂e or 50 percent of the total City emissions. The second largest sector was commercial and industrial energy use with estimated emissions of 57,950 or 22 percent of the total City emissions. The commercial and industrial energy and waste sectors made up the remaining 28 percent of the total city emissions. Table 1.1 presents the original estimated 2005 GHG emissions by sector and their percent of total emissions.

Table 1.1. San Luis Obispo Community GHG Emissions (2005)

Community Sector	MTCO ₂ e	Percent of Total
Transportation	132,142	50%
Nonresidential Energy	57,950	22%
Residential Energy	55,377	21%
Waste	18,768	7%
Total	264,237	100%

Source: City of San Luis Obispo Climate Action Plan (2009)

1.3 2005 Updated Community GHG Inventory

To assess climate action progress, the City updated the 2005 baseline inventory for consistency with current protocols and best practices. This section provides updated GHG emissions data estimates for the baseline year of 2005 to allow for an “apples to apples” comparison to the 2016 GHG inventory. The City updated the 2005 GHG inventory to reflect an updated scientific understanding of how different greenhouse gasses contribute to global warming, to include a

² Due to lagging data availability, 2016 is the most recent year for complete GHG inventory data. Annual inventory updates will occur beginning in 2020. Where more current information is available by sector, it is provided in this report.

more accurate assessment of transportation related emissions, and to respond to changes to data privacy rules and collection methods that affect how data is provided.

Table 1.2 provides the updated 2005 baseline GHG emissions inventory with updated total GHG emissions of 386,630 MTCO₂e. Similar to the original 2005 inventory, the largest sector contributing to the City's total GHG emissions was transportation with an estimated emissions total of 225,390 MTCO₂e or 58 percent of the City's total.³ The commercial and industrial energy sector was the second largest sector contributing a total of 58,050 MTCO₂e GHG emissions or 15 percent of the City's total. The remaining sectors of residential energy and solid waste made up the remaining 28 percent of the City's total emissions in 2005.

Table 1.2. 2005 update baseline GHG emissions.

Sector	Subsector	Subsector MTCO ₂ e	Sector MTCO ₂ e	Sector Percent of Total
Transportation	On-Road Transportation	225,390	225,390	58%
Nonresidential Energy	Commercial/Industrial electricity	35,510	58,050	15%
	Commercial/Industrial natural gas	22,540		
Residential Energy	Residential electricity	20,870	55,450	14%
	Residential natural gas	34,580		
Solid Waste	Community-wide municipal solid waste disposal tons	47,740	47,740	12%
Total			386,630	100%

1.4 2016 Community GHG Inventory

In 2018, the City prepared a community-wide inventory of GHG emissions for the 2016 calendar year. Table 1.3 provides the 2016 GHG emissions inventory results. In 2016, San Luis Obispo's total GHG emissions were estimated to be 339,290 MTCO₂e. As in 2005, transportation was the largest contributor to the City's total GHG emissions with an estimated 212,980 MTCO₂e or 63 percent of the City's total emissions. Commercial and Industrial energy was the second largest sector with GHG emissions of 44,270 MTCO₂e or 13 percent of the City's total emissions. The sectors of residential energy and solid waste account for the remaining 26 percent of the City's total 2016 GHG emissions.

³ Section 3 provides an explanation for the significant increase in estimated transportation emissions in the revised 2005 baseline over the original draft.

Table 1.3. 2016 GHG emissions.

Sector	Subsector	Subsector MTCO _{2e}	Sector MTCO _{2e}	Sector Percent of Total
Transportation	On-Road Transportation	212,980	212,980	63%
Nonresidential Energy	Commercial/Industrial electricity	22,050	44,270	13%
	Commercial/Industrial natural gas	22,220		
Residential Energy	Residential electricity	10,320	39,410	11%
	Residential natural gas	29,090		
Solid Waste	Community-wide municipal solid waste disposal tons	42,630	42,630	13%
Total			339,290	100%

1.5 Progress Toward 2020 Target

Table 1.4 provides a comparison overview of emissions from baseline year 2005 to 2016 to show the City’s progress toward its target to reduce GHG emissions 15 percent below 2005 emission levels. Over the eleven-year period, emissions were estimated to have dropped by 13 percent. The most significant changes occurred in the energy, solid waste, and off-road sectors.

- Energy emissions dropped by approximately 26 percent and reflects a significant change in the carbon intensity of grid consumed electricity, a substantial increase in rooftop renewable energy systems, and investment in energy efficiency.
- Solid waste emissions decreased by approximately 11 percent due to a decrease in the amount of solid waste produced by San Luis Obispo residents and businesses.

Section 2 provides a detailed report for each GHG emissions sector and the changes in emissions from each sector from 2005 to 2016.

Table 1.4. GHG emissions, 2005-2016 (MTCO_{2e}).

Sector	2005	2016	Percent Change
Transportation	225,390	212,980	-6%
Nonresidential Energy	58,050	44,270	-24%
Residential Energy	55,450	39,410	-29%
Solid Waste	47,740	42,630	-11%
Total	386,630	339,290	-12%

1.6 Progress to State GHG Reduction Targets

The key drivers for updating the community GHG inventory are 1) to assess progress toward the City’s GHG emissions reduction target, and 2) to establish the foundation for the Climate Action Plan update. Consistent with Assembly Bill (AB) 32, the City’s current adopted target is to achieve

a 15 percent reduction below baseline emissions by 2020. Since the baseline inventory was updated through this inventory process, resulting in a slightly increased baseline, a new target must be calculated.

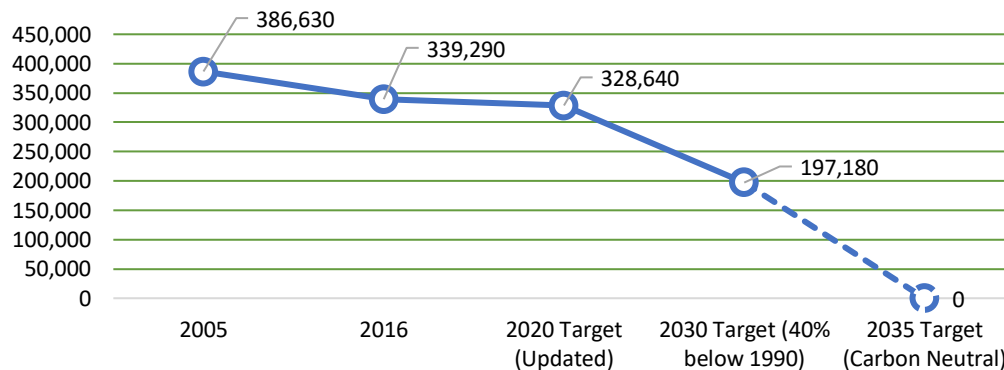
As noted in Table 1.5 and Figure 1.2, a 15 percent reduction in baseline emissions is 328,640 MTCO₂e from the updated baseline year emissions of 386,630 MTCO₂e. The 2016 emissions estimate of 339,290 MTCO₂e represents a 12 percent reduction in GHG emissions, notable progress toward the 2020 target.

Since adoption of the City's CAP in 2012, the state adopted a 2030 target through Senate Bill (SB) 32. If the City adopts a 2030 goal that matches the state target of reducing GHG emissions 40 percent below the 2020 target levels, the target for San Luis Obispo would be 197,180 MTCO₂e. In September of 2018, Council directed staff to develop a climate action plan with a reduction target of carbon neutrality by 2035. A carbon neutrality by 2035 target would require achieving a far greater reduction than the SB32 requirements by 2030.

Table 1.5. Progress to AB32 and SB 32 target (MTCO₂e).

Year	Emissions
2005 (Updated)	386,630
2016	339,290
2020 Target (Updated)	328,640
2030 Target (40% below 1990)	197,180
2035 Target (Carbon Neutral)	0

Figure 1.1 Progress to AB32, SB 32, and Carbon Neutrality target.



2. COMMUNITY ENERGY

2.1 Community Energy Sector Overview

This section presents the GHG emissions for the energy sector, specifically emissions generated from residential and non-residential energy use that has occurred within City limits. This section presents the updated 2005 GHG emissions along with updated emissions for 2016.

2.2 Updated Inventory Data and Methods

The update to the 2005 inventory for the energy sector incorporates changes in scientific understanding of how different greenhouse gasses contribute to global warming and changes to data privacy rules that affect how energy data is retained and provided. This section provides updated electricity and natural gas activity data and emissions estimates for the baseline year of 2005, as well as electricity and natural gas activity data and GHG emissions estimates for years 2005 through 2016.

2.2.1 Electricity

Pacific Gas & Electric (PG&E) Company provides electric service to the community and offers community electricity data to local agencies through the PG&E Green Community Portal. The electricity data (presented in kilowatt-hours, or kWh) in Table 2.1 is separated between residential and non-residential uses, which is the finest resolution possible to prevent data from being removed for privacy purposes.

Table 2.1. Community electricity activity data, 2005-2016 (kWh).

Year	Residential	Nonresidential	Total
2005	93,045,220	158,267,695	251,312,915
2006	94,844,802	165,562,683	260,407,485
2007	92,479,221	170,259,426	262,738,647
2008	91,007,229	176,783,866	267,791,095
2009	89,252,248	183,654,370	272,906,618
2010	87,910,124	218,185,988	306,096,112
2011	86,239,267	172,742,643	258,981,910
2012	85,773,964	172,045,211	257,819,175
2013	84,492,752	171,842,797	256,335,549
2014	78,932,662	171,846,749	250,779,411
2015	78,069,529	170,606,678	248,676,207
2016	76,376,280	163,204,691	239,580,971
2017	76,543,278	165,277,531	241,820,809
2018	74,076,694	159,958,964	234,035,658

Nonresidential electricity use includes commercial, governmental, agricultural, and industrial usage. From 2005 to 2016, residential electricity usage decreased by 18 percent and non-residential electricity consumption increased approximately 3 percent. Between 2005 and 2016, total electricity use decreased by 5 percent. Table 2.1 includes activity data for 2017 and 2018 for informational purposes. Data for both years indicate a continuing downward trend.

The 18 percent decrease in residential electricity usage may be due to low residential growth, a significant increase in residential renewable energy installations, increases in energy efficiency investments, and overall trends toward conservation.

To calculate GHG emissions, an emissions factor is applied to the activity data. Table 2.2 shows the electricity emissions factors for the three major greenhouse gasses occurring as the result of electricity use in the city. PG&E staff provided CO₂ emissions factors via the Green Community Portal data request in 2018 and 2019. In addition to carbon dioxide (CO₂), small amounts of methane (CH₄) and nitrous oxide (N₂O) are released in the electricity generation process. CH₄ and N₂O emissions factors are provided by PG&E's third-party-verified GHG inventory. Variability of the emissions factors occur primarily due to two factors: 1) fluctuations in hydro power production as the result of precipitation variability, and 2) increasing renewable energy sources in PG&E's power portfolio. CO₂ is the most commonly referenced GHG, however, numerous gasses have greenhouse characteristics. Methane and nitrous oxide are commonly accounted for in GHG inventories. These gasses have a greater global warming potential; CH₄ traps approximately 86 times as much heat as CO₂ over a 20-year period and N₂O traps approximately 265 times as much heat. To account for these differences, a factor is applied to the gasses emissions to calculate aCO₂ equivalence. Table 2.2 provides the emissions factors for 2005 through 2018. Due to changes in PG&E's energy portfolio (and particularly an increase in renewable energy supplies), the 2016 emissions factor is approximately 40 percent lower than the 2005 factor. Figure 2.1 illustrates the changes in MTCO₂e/kWh factors from 2005 to 2016.

Table 2.2. Electricity conversion factor (MTCO₂e/kWh).

Year	kWh/MTCO ₂ e
2005	0.000224
2006	0.000208
2007	0.000290
2008	0.000292
2009	0.000262
2010	0.000203
2011	0.000179
2012	0.000203
2013	0.000195
2014	0.000198
2015	0.000185
2016	0.000135
2017	0.000097
2018	0.000134

Figure 2.1. Electricity emissions factor (MTCO₂e/kWh).

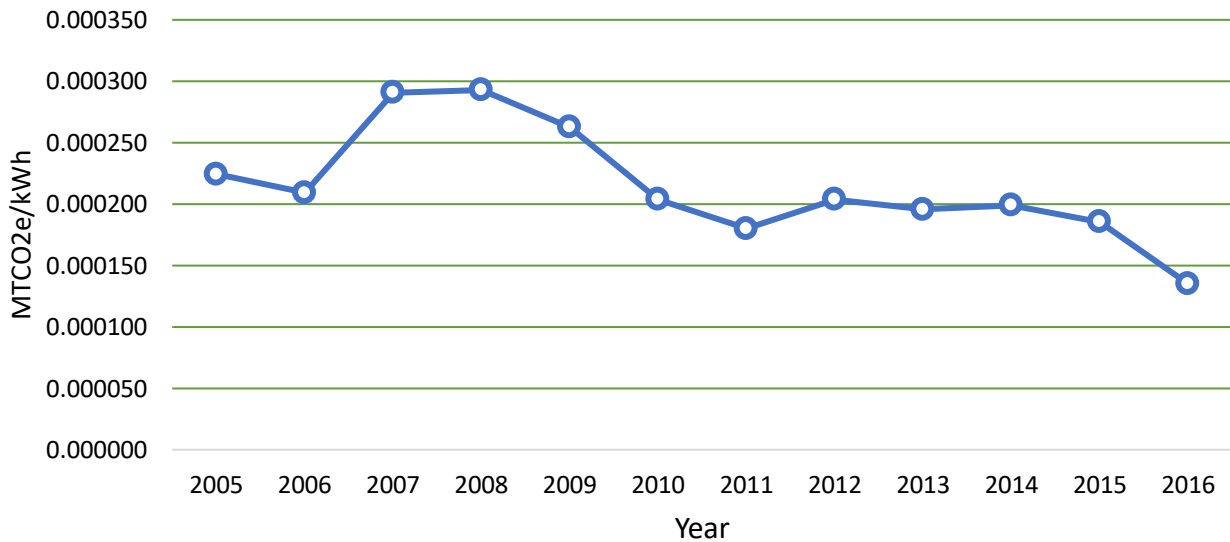


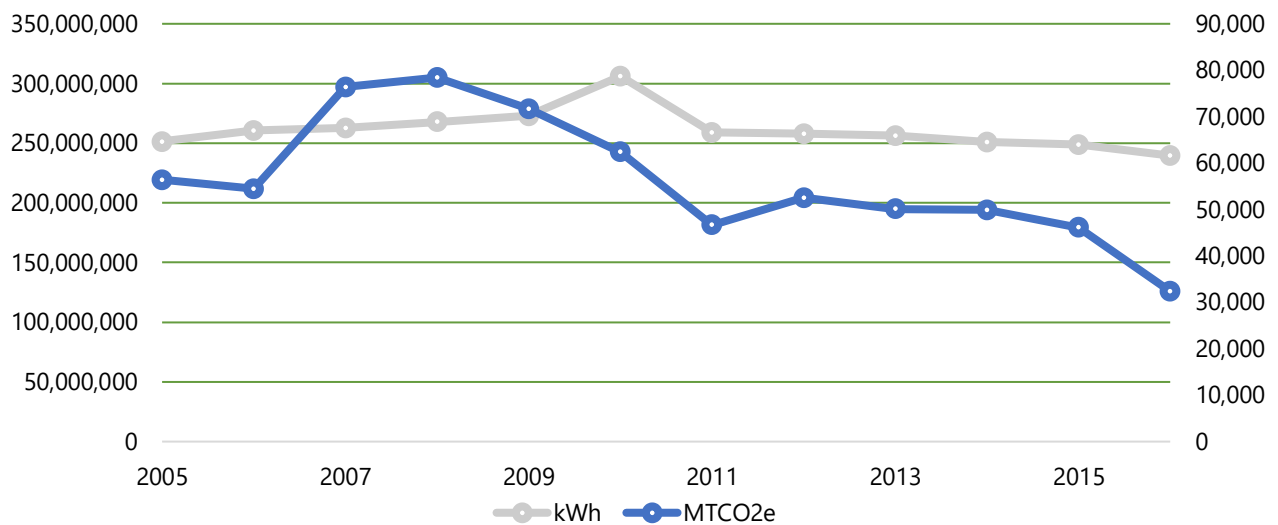
Table 2.3 provides the GHG emissions from electricity use in the city by residential and nonresidential subsectors from 2005 to 2016. During this time, electricity related residential GHG emissions decreased by approximately 50 percent, while nonresidential electricity emissions decreased by approximately 38 percent. Overall emissions decreased approximately 43 percent over the same period.

Table 2.3. Community electricity GHG estimates, 2005-2018 (MTCO_{2e}).

Year	Residential	Nonresidential	Total
2005	20,870	35,510	56,380
2006	19,840	34,620	54,460
2007	26,880	49,490	76,370
2008	26,650	51,770	78,420
2009	23,450	48,240	71,690
2010	17,910	44,440	62,350
2011	15,530	31,120	46,650
2012	17,480	35,050	52,530
2013	16,520	33,600	50,120
2014	15,710	34,210	49,920
2015	14,480	31,640	46,120
2016	10,320	22,050	32,370
2017	7,430	16,040	23,470
2018	9,940	21,470	31,410

Figure 2.2 illustrates GHG and kWh activity data trends between 2005 and 2016 on the same chart. It is important to note that while overall electricity use has been steadily decreasing, GHG emissions have been more variable due to changes in PG&E’s power portfolio and the related carbon intensity of the electricity it supplies.

Figure 2.2. Total community electricity activity data and GHG estimates, 2006-2016.



2.2.2 Natural Gas – Direct Emissions

Natural gas is primarily composed of methane and includes very small amounts of ethane, propane, butane, pentane, nitrogen, and carbon dioxide. When natural gas is combusted, most of the methane becomes carbon dioxide and water. Traditionally, greenhouse gas emissions inventories account for the emissions that occur as the result of the onsite combustion of natural gas. Southern California Gas Company (SoCalGas) provides natural gas utility services in the city. Table 2.4 provides the natural gas activity data in therms from 2005-2016 separated by residential and nonresidential uses. Non-residential use combines commercial and industrial use.

Table 2.4. Community natural gas activity data, 2005-2018 (Therms).

Year	Residential	Nonresidential	Total
2005	6,460,870	4,211,790	10,672,660
2006	6,643,410	4,501,180	11,144,590
2007	6,702,810	4,532,760	11,235,570
2008	--	--	--
2009	--	--	--
2010	--	--	--
2011	--	--	--
2012	--	--	--
2013	--	--	--
2014	5,275,340	3,987,264	9,262,604
2015	5,068,160	3,952,562	9,020,722
2016	5,435,586	4,151,275	9,586,861
2017	5,667,638	4,289,700	9,957,338
2018	5,621,586	4,227,571	9,849,157

Note: 2008-2013 data is not available.

As a company policy, SoCalGas only retains community natural gas data through 2014, which means the data in the original 2005 baseline inventory must be used in conjunction with the data provided via an Energy Data Request Portal request submitted by City staff in 2017. Since SoCalGas cannot confirm the 2005 inventory data, the comparison in natural gas consumption in the baseline year and years 2014-2017 should be observed with caution. The natural gas data provided in Table 2.4 shows a 16 percent decrease in residential therms and a 1 percent increase in non-residential usage between 2005 and 2016. Combined, the natural gas sector has a net decrease of 10 percent. Table 2.4 also includes 2017 and 2018 data for informational purposes and to illustrate a slight increase in natural gas use.

Just as with electricity, GHG emissions are estimated from activity data by applying an emission coefficient to the activity data. Table 2.5 shows the emission coefficient for converting therms of natural gas combusted on-site to MTCO_{2e}. Unlike electricity, the inventory assumes no changes in the carbon intensity of combusting natural gas in any given year, as the chemical composition of combusted natural gas does not substantially vary from year to year.

Table 2.5. Local Government Operations Protocol (LGOP) natural gas carbon dioxide equivalent.

Greenhouse Gas	MTCO ₂ e/Therm
CO ₂ ¹	0.005310
CH ₄ ¹	0.000043
N ₂ O ¹	0.000003
CO₂e²	0.005320

Table 2.6 provides GHG emissions estimates in MTCO₂e for natural gas consumption in the city from 2005-2016. As noted in the natural gas activity data, there was a 16 percent decrease in MTCO₂e for residential and a 1 percent decrease for non-residential sectors with a total decrease in natural gas-related emissions of 10 percent.

Table 2.6. Community Natural Gas GHG estimates, 2005-2016 (MTCO₂e).

Year	Residential	Nonresidential	Total
2005	34,580	22,540	57,120
2006	35,550	24,090	59,640
2007	35,870	24,260	60,130
2008	--	--	--
2009	--	--	--
2010	--	--	--
2011	--	--	--
2012	--	--	--
2013	--	--	--
2014	28,230	21,340	49,570
2015	27,120	21,150	48,270
2016	29,090	22,220	51,310
2017	30,330	22,960	53,290
2018	30,080	22,620	52,700

Note: 2008-2013 data is not available.

2.2.3 Natural Gas – Fugitive Emissions

Methane is a powerful greenhouse gas and 86 times stronger than carbon dioxide over a 20-year time period in the atmosphere. As more is learned about the total natural gas system leakage rate from well head, through the transmission system, to the distributions system, and at the end use, it is becoming clear that fugitive methane emissions from the usage of natural gas is a critical component of the climate crisis. Staff is currently working with technical experts to identify a defensible method for estimating these emissions. Although not included in this report, they will likely be included prior to the Climate Action Plan update that will be adopted in 2020.

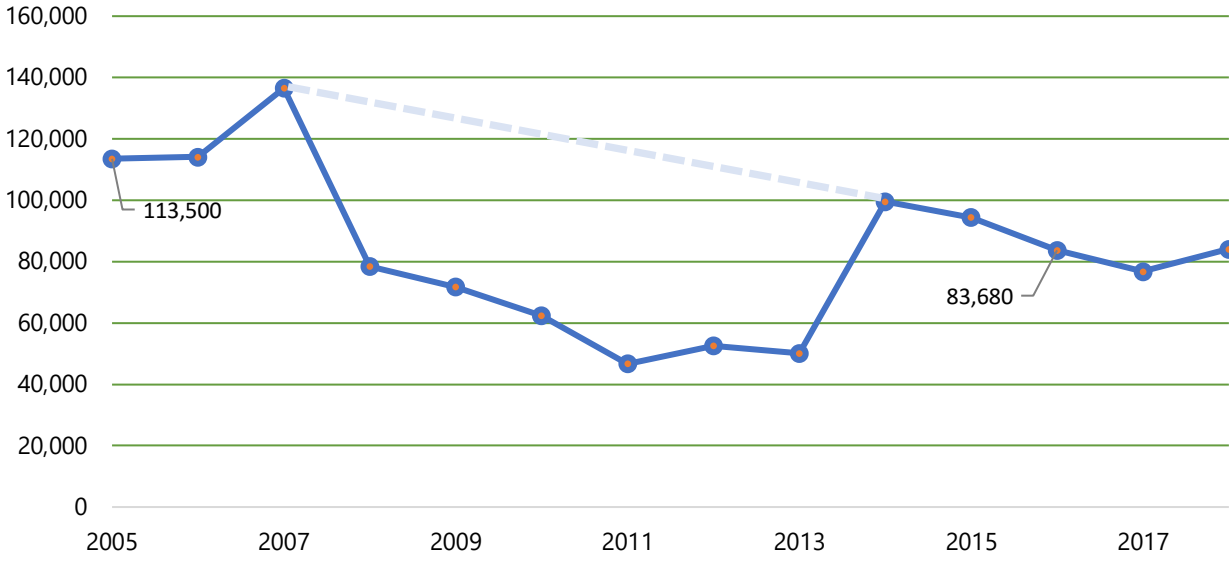
2.3 Total Energy GHG Emissions

Table 2.7 and Figure 2.3 show the total energy-related GHG emissions separated by energy type and subsector. The residential energy subsector saw a 29 percent decrease in emissions between 2005 and 2016. The nonresidential subsector emissions decreased by 24 percent. Overall, energy GHG emissions dropped by 26 percent over the 11-year period. Note that Figure 2.3 provides total energy sector emissions with a dark line; the dashed line indicates a total emissions estimate necessitated by SoCalGas’s inability to provide historical data.

Table 2.7. Energy GHG emissions, 2005-2016 (MTCO_{2e}).

Year	Residential		Nonresidential		Total		
	Electricity	Natural Gas	Electricity	Natural Gas	Res.	Nonres.	Total
2005	20,870	34,580	35,510	22,540	55,450	58,050	113,500
2006	19,840	35,550	34,620	24,090	55,390	58,710	114,100
2007	26,880	35,870	49,490	24,260	62,750	73,750	136,500
2008	26,650	--	51,770	--	--	--	--
2009	23,450	--	48,240	--	--	--	--
2010	17,910	--	44,440	--	--	--	--
2011	15,530	--	31,120	--	--	--	--
2012	17,480	--	35,050	--	--	--	--
2013	16,520	--	33,600	--	--	--	--
2014	15,710	28,230	34,210	21,340	43,940	55,550	99,490
2015	14,480	27,120	31,640	21,150	41,600	52,790	94,390
2016	10,320	29,090	22,050	22,220	39,410	44,270	83,680
2017	7,430	30,330	16,040	22,960	37,760	39,000	76,760
2018	9,940	30,080	21,470	22,620	40,020	44,090	84,110

Figure 2.3. Energy GHG emissions, 2005-2016 (MTCO₂e).



3. TRANSPORTATION

3.1 Transportation Sector Overview

This section presents the GHG emissions for the transportation sector and includes emissions from all on-road trips (including cars, trucks, buses, etc.) that have occurred within City limits. This section presents the updated 2005 GHG emissions along with updated emissions for 2016.

3.2 Updated Inventory Data and Methods

This section provides updated activity data and emissions estimates for baseline year 2005 and activity data and emissions estimates for 2016. Since the 2005 baseline inventory was completed in 2009, the state has updated emissions factors and legislation on fuel economy standards. Additionally, the City has adopted a transportation model that more accurately models the vehicle miles travelled in, to, and from city boundaries.

The original 2005 inventory used the “geographic system boundary” method which considers transportation activity occurring solely within city boundaries, regardless of where a trip’s destination begins or ends. This method included emissions from vehicles that were travelling through city boundaries but did not account for any of “outside of city boundary” miles that occurred from trips that originated or ended in the city.

In 2019, the City was able to use its own “origin-destination” transportation model to estimate the vehicle miles for trips that began and ended in the city, trips that began outside the city and ended in the city, trips that began in the city and ended outside the city, and trips that passed through the city without stopping. Consistent with the preferred GPC accounting method, the updated inventory includes 100 percent of internal trip miles, 50 percent of the miles for trips that start or end in the city, and zero percent of the miles that are from vehicles passing through the city.

The updated transportation model currently only estimates vehicle miles travelled for calendar year 2016. To estimate baseline 2005 emissions, the City replicated the 2005 “geographic system boundary” model with 2016 data and found a 3 percent increase in vehicles miles travelled. Assuming the two methods would capture the same scale and direction of change between 2005 and 2016, 2005 origin-destination VMT was estimated by reducing the 2016 VMT by 3 percent. Table 3.1 reports the 2005 and 2016 VMT estimates.

Table 3.1. 2005 and 2016 VMT estimates.

Measure	2005	2016
Annual VMT	461,452,450	475,634,980

Source: City of San Luis Obispo, Public Works Department.

The origin destination model is preferred to the geographic model because it allows the City to understand where trips are occurring. The new method identifies a key finding: over 80 percent of community VMT occurred as the result of regional trips (e.g., trips to the city from outside the city or trips from the city to areas outside the city).

Vehicle miles traveled estimates for both years were converted to GHG emissions using the 2014 Emissions Factor (EMFAC) model. EMFAC represents the state’s current understanding of motor

vehicle travel activities and their associated emission levels. EMFAC 2014 is the latest U.S. Environmental Protection Agency (EPA) approved motor vehicle emission model that assesses emissions from on-road vehicles including cars, trucks, and buses in California. The City used EMFAC 2014 to estimate emissions factors for this updated report.

Table 3.2 provides the VMT and associated GHG emissions for each vehicle class in San Luis Obispo County for 2005 and 2016. GHG emissions were estimated using the California Air Resources Board (CARB) EMFAC 2014 tool. Using VMT as inputs, EMFAC 2014 generated VMT and CO₂ emission results for both 2005 and 2016 for each type of vehicle common in San Luis Obispo County. The City used this information to generate a CO₂/VMT emissions factor specific to San Luis Obispo County, reflecting the unique balance of different vehicle types, vehicle ages, and vehicle fuels used county-wide.

EMFAC 2014 does not model CH₄ and N₂O emissions. The standard practice is to multiply CO₂ emissions factors by 100/95 (approximately 1.05) to convert CO₂ emissions to CO₂e. As the emissions factor generated by EMFAC is in tons of CO₂/VMT, the City also converted the units of this factor to metric tons. The City then applied this converted emissions factor to the total City VMT given in Table 3.1. This resulted in the total annual greenhouse gas emissions.

3.3 Total Transportation GHG Emissions

Table 3.2 shows that as VMT was modelled to increase from 2005 to 2016 by 3 percent, the total GHG emissions from on-road transportation decreased by approximately 6 percent. The decrease in GHG emissions is attributed to state and federal fuel efficiency standards, low carbon fuel standards, and an increasingly efficient overall fleet of vehicles (including an increased uptake of electric, hybrid, and high efficiency vehicles) within the city that is resulting in the emissions decline, despite an increase in miles driven.

Table 3.2. Total annual VMT emissions.

	2005			2016		
	Total VMT	MTCO ₂ e/ VMT	Total Emissions	Total VMT	MTCO ₂ e/ VMT	Total Emissions
All vehicles	461,452,446	0.000488	225,390	475,634,980	0.000448	212,980

4. SOLID WASTE

4.1 Solid Waste Sector Overview

This section presents the GHG emissions for the solid waste sector, specifically emissions from the disposal of solid waste produced within City limits into a landfill. This section presents the updated 2005 GHG emissions along with updated emissions for 2016.

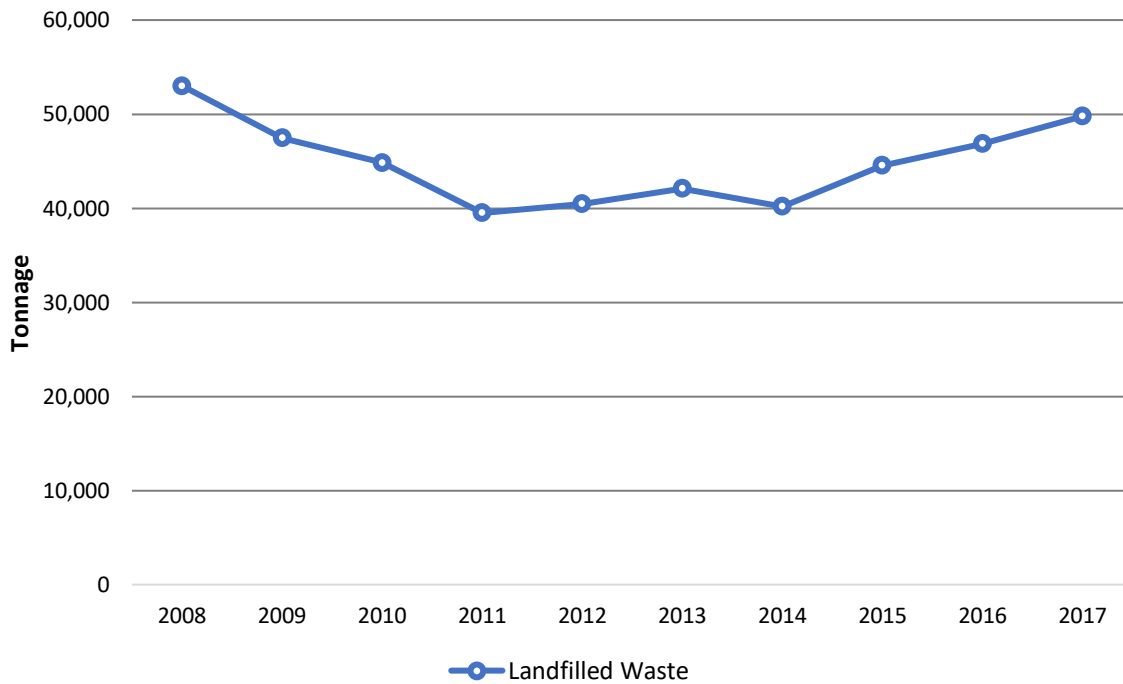
4.2 Updated Inventory Data and Methods

This section provides updated solid waste activity data for the baseline year of 2005, as well as activity emissions estimates for years 2005 through 2016 to estimate the City's total greenhouse gas emissions. The City of San Luis Obispo deposits all waste generated within city limits into the Cold Canyon Landfill. Cold Canyon Landfill provided solid waste disposal data. Table 4.1 and Figure 4.1 provide the City's solid waste disposal tonnage for 2005 to 2016. Data for 2005 to 2007 was not able to be collected; therefore 2008 data was used as a proxy.

Table 4.1. City solid waste activity data, 2008-2016 (Disposal Ton).

Year	Total Waste (Disposal Ton)
2008	53,010
2009	47,483
2010	44,836
2011	39,497
2012	40,469
2013	42,094
2014	40,200
2015	44,530
2016	46,860

Figure 4.1. Total City solid waste (Disposal Ton).



4.2.1 Green Waste

Green waste data was provided by the City of San Luis Obispo Utilities Department for years 2006 through 2016. Green waste is a part of the diverted waste stream to the Cold Canyon Landfill, which means that it is not buried at the plant. Traditionally, green waste was either used as alternative daily cover at the Cold Canyon Landfill or hauled to a windrow composting facility near Santa Maria. There is no standard protocol for estimating the emissions from windrow composting and therefore no emissions are estimated in this inventory. However, given the importance of diverting organic materials, the subsequent construction and operation of an anaerobic digester to process organic green waste in 2018, and legislation requiring substantial increases in organic waste diversion, staff will continue to monitor the availability of a standard method and will include this information in future greenhouse gas and Climate Action Plan updates.

4.2.2 Municipal Solid Waste GHG Emissions Conversion Factor

This inventory follows the “methane commitment method” to account for the future emissions produced from annually deposited solid waste. This method requires the following steps:

1. Estimate the percent of degradable organic materials in landfilled waste.
2. Identify the conversion factor to translate tons of carbon dioxide to metric tons of methane.
3. Estimate the amount of methane per ton of landfilled waste that will enter the atmosphere.
4. Convert the estimate of methane to carbon dioxide equivalence.

1. Estimate the percent of degradable organic materials in landfilled waste.

The CARB Municipal Solid Waste Characterization Landfill Tool v. 1.3 provides landfill waste characterization estimates for waste by type sent to California landfills. The waste types identified in the waste characterization studies are listed in Table 4.2. For each of these waste types, the

tool includes California average estimates of the fraction of waste-in-place (WIPFRAC), total degradable organic carbon (TDOC), and the decomposable anaerobic fraction (DANF) of the waste type.⁴ There are two relevant waste characterization studies for this inventory: one from 2003 to 2006 and the other from 2007 to the present. Table 4.2 provides information about waste characterization estimates used in this inventory, as well as the degradable organic content (DOC) percent per ton of solid waste, which is calculated by multiplying WIPFRAC, TDOC, and DANF for each waste type.

Table 4.2. Total percent of waste degradable based on waste type.

Waste Type	2003-2006				2007-Present			
	WIPFRAC	TDOC	DANF	DOC	WIPFRAC	TDOC	DANF	DOC
Newspaper	2.20%	47.09%	15.05%	0.16%	1.65%	47.09%	15.05%	0.12%
Office Paper	1.95%	38.54%	87.03%	0.65%	1.84%	38.54%	87.03%	0.62%
Corrugated Boxes	5.75%	44.84%	44.25%	1.14%	4.80%	44.84%	44.25%	0.95%
Coated Paper	11.09%	33.03%	24.31%	0.89%	8.98%	33.03%	24.31%	0.72%
Food	14.55%	14.83%	86.52%	1.87%	15.50%	14.83%	86.52%	1.99%
Grass	2.81%	13.30%	47.36%	0.18%	1.90%	13.30%	47.36%	0.12%
Leaves	1.41%	29.13%	7.30%	0.03%	3.24%	29.13%	7.30%	0.07%
Branches	2.59%	44.24%	23.14%	0.26%	1.95%	44.24%	23.14%	0.20%
Lumber	9.65%	43.00%	23.26%	0.96%	14.51%	43.00%	23.26%	1.45%
Textiles	4.44%	24.00%	50.00%	0.53%	5.47%	24.00%	50.00%	0.66%
Diapers	4.36%	24.00%	50.00%	0.52%	4.33%	24.00%	50.00%	0.52%
Construction/ Demolition	12.06%	4.00%	50.00%	0.24%	5.48%	4.00%	50.00%	0.11%
Medical Waste	0.04%	15.00%	50.00%	0.00%	0.00%	15.00%	50.00%	0.00%
Sludge/Manure	0.09%	5.00%	50.00%	0.00%	0.05%	5.00%	50.00%	0.00%

Source: CARB Municipal Solid Waste Characterization Landfill Tool v. 1.3

2. Identify the conversion factor to translate tons of carbon dioxide to metric tons of methane.

The next step in calculating the emissions factor is estimating the metric tons of methane to be generated from the organic content in the landfilled waste. Solid waste activity data is reported in tons, while the standard unit for GHG reporting is metric tons. Table 4.3 presents the conversion factors to metric tons. As the decomposing organic content in landfilled solid waste transitions from carbon to methane, the atomic mass changes as well. Since the CO₂e in this inventory is presented as mass (metric tons), this change in mass is accounted for with the stoichiometric ratio between CH₄ and carbon.

Finally, of the total landfill gas generated from decomposing waste, approximately half is methane; a methane gas fraction is applied to remove other gasses from the total. The remainder is biogenic

⁴ For more information, visit https://ww3.arb.ca.gov/cc/protocols/localgov/pubs/landfill_emissions_tool_v1_3_2011-11-14.xls

CO₂ from vegetation from natural areas, crops, and urban vegetation and *de minimus* amounts of N₂O. The GPC advises against accounting for either of these gases in a community inventory.

Table 4.3. Conversion to metric tons of methane.

lbs/ton ¹	MT/lbs ¹	Stoichiometric ratio between CH ₄ and carbon ²	Fraction of CH ₄ Gas in Landfill Gas ³	Metric Tons of Methane
2000	0.000454	1.333333	0.5	0.604796

¹ Standard conversion factor.

² 16/12, provided by the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories.

³ IPCC Good Practices Guidance and Uncertainty Management in National Greenhouse Gas Inventories (2000) default range.

3. Estimate the amount of methane per ton of landfilled waste that will enter the atmosphere.

The next factor in the solid waste emissions coefficient is the amount of landfill gas that is collected by landfill gas capture systems. The San Luis Obispo County Air Pollution Control District (APCD) provides landfill capture rates for Cold Canyon Landfill, as provided in Table 4.4 for the years 2008 – 2013. The landfill capture rate for 2006 is sourced from the County of San Luis Obispo EnergyWise Plan Appendix A. Given the lack of data availability for several years, including 2005, 2007, 2014, 2015, and 2016 and the significant variability across years, this inventory relied on the EPA’s standard landfill methane capture rate of 75 percent.

Table 4.4. Recorded methane capture rates from Cold Canyon Landfill.

Year	Cold Canyon
2005	Not Available
2006	60%
2007	Not Available
2008	70%
2009	99%
2010	85%
2011	85%
2012	85%
2013	75%

The next phase of the equation considers the amount of methane that is oxidized in the soil. As reported in Table 4.5, only 25 percent of landfill gas enters the atmosphere. Of that 25 percent, 10 percent is oxidized on site in the soil of the land fill cover. Of the 75 percent of the methane that is captured, approximately 99 percent enters the atmosphere as CO₂ due to the methane being combusted as part of the flaring process. Approximately 23 percent of the total methane emitted enters the atmosphere. Table 4.5 shows the factors used in this calculation.

Table 4.5. Percent of emissions reaching the atmosphere.

Fraction of methane recovered (f_{rec}) ¹	Oxidation factor (OX) ²	Methane correction factor (MCF) ³	Percent of Emissions Reaching Atmosphere
75%	10%	99%	23.3%

¹ Landfill gas capture rate, as provided by the Environmental Protection Agency

² IPCC Good Practices Guidance and Uncertainty Management in National Greenhouse Gas Inventories (2000) well-managed landfills factor.

³ IPCC Good Practices Guidance and Uncertainty Management in National Greenhouse Gas Inventories (2000) managed landfill factor.

4. Convert the estimate of methane to carbon dioxide equivalence.

The solid waste CO₂e conversion factor was calculated by multiplying the total degradable content of each weight type (DOC), metric ton conversion factor, methane generation, and the IPCC Fifth Assessment Report methane 20-year global warming potential (Table 4.6). The factors for each waste type are then weighted by the waste composition data to obtain a single emissions factor for a ton of mixed waste. In 2005 to 2006, each ton of solid waste deposited in a landfill is estimated to produce approximately 0.901 MTCO₂e per ton as it degrades over time. For 2007 to 2016, the conversion factor is 0.910 MTCO₂e per ton of solid waste.

Table 4.6. Disposed solid waste conversion factor with Fifth Assessment Report global warming potential (MTCO₂e/Disposal Ton).

Waste Type	2003-2006 DOC ¹	2007-Present DOC ¹	Metric Ton (MT)	CH ₄ emissions	CH ₄ GWP ²	2003-2006 MTCO ₂ e/Ton	2007-Present MTCO ₂ e/Ton
Newspaper	0.16%	0.12%	0.604796033	0.2325	86	0.018893	0.014147
Office Paper	0.65%	0.62%	0.604796033	0.2325	86	0.079150	0.074673
Corrugated Boxes	1.14%	0.95%	0.604796033	0.2325	86	0.137882	0.115122
Coated Paper	0.89%	0.72%	0.604796033	0.2325	86	0.107692	0.087188
Food	1.87%	1.99%	0.604796033	0.2325	86	0.225818	0.240600
Grass	0.18%	0.12%	0.604796033	0.2325	86	0.021405	0.014505
Leaves	0.03%	0.07%	0.604796033	0.2325	86	0.003612	0.008322
Branches	0.26%	0.20%	0.604796033	0.2325	86	0.031997	0.024157
Lumber	0.96%	1.45%	0.604796033	0.2325	86	0.116652	0.175520
Textiles	0.53%	0.66%	0.604796033	0.2325	86	0.064439	0.079358
Diapers	0.52%	0.52%	0.604796033	0.2325	86	0.063217	0.062825

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Waste Type	2003-2006 DOC ¹	2007- Present DOC ¹	Metric Ton (MT)	CH ₄ emissions	CH ₄ GWP ²	2003- 2006 MTCO ₂ e/ Ton	2007- Present MTCO ₂ e/ Ton
Construction/ Demolition	0.24%	0.11%	0.604796033	0.2325	86	0.029159	0.013245
Medical Waste	0.00%	0.00%	0.604796033	0.2325	86	0.000346	0.000000
Sludge/Manure	0.00%	0.00%	0.604796033	0.2325	86	0.000274	0.000155
Total	--	--	--	--	--	0.901	0.910

Note: Values are rounded causing final values to be inconsistent with calculations.

¹ Source: CARB Municipal Solid Waste Characterization Landfill Tool v. 1.3.

² IPCC Fifth Assessment Report

4.3 Total Solid Waste GHG Emissions

To estimate the solid waste GHG emissions, the carbon dioxide equivalency conversion factor was multiplied by the disposal ton activity data. Once these were applied, the annual solid waste disposal ton emissions were calculated. As shown in Table 4.7, from 2005 to 2016, the solid waste sector experienced a decrease in emissions by nearly 11 percent.

Table 4.7. Total solid waste disposed emissions (MTCO₂e).

Year	Total Waste (Disposal Ton)	MTCO ₂ e Conversion Factor	Solid Waste Disposed MTCO ₂ e
2005	53,011	0.901	47,740
2006	53,011	0.901	47,740
2007	53,011	0.910	48,230
2008	53,011	0.910	48,230
2009	47,483	0.910	43,200
2010	44,836	0.910	40,790
2011	39,497	0.910	35,930
2012	40,469	0.910	36,820
2013	42,094	0.910	38,300
2014	40,200	0.910	36,570
2015	44,530	0.910	40,510
2016	46,857	0.910	42,630

5. FORECAST

The GHG emissions forecast estimates how San Luis Obispo’s emissions would change over time if no action were taken to reduce emissions. The forecast is based on changes to the number of people who live and work in San Luis Obispo. As the population grows and more people work in the community, there will be an increase (absent state or local action) in the amount of energy used, vehicle miles traveled, trash thrown away, and other activities that generate GHG emissions.

The demographic projections used in the forecast come from the Land Use and Circulation Element of the City’s General Plan, which guides long-term growth and development in the community. These projections assume that the development anticipated in the Land Use and Circulation is fully implemented by 2035. It is assumed that jobs in San Luis Obispo County increase at a rate of 1.1 percent, as forecasted in the Land Use and Circulation Element, starting from the number of jobs in the community in 2015 as reported by the US Census. Table 6.1 shows the demographic changes assumed in the forecast and their applicable subsectors.

Table 5.1. Demographic projections (2005-2035).

Demographic Indicator	Applicable Subsectors	2005	2016	2020	2030	2035
Population	None	44,519	46,117	48,826	53,934	56,686
Housing units	Residential electricity, residential natural gas	20,391	21,155	22,190	24,512	25,762
Jobs ¹	Commercial/industrial electricity, commercial/industrial natural gas	43,847	50,985	53,153	59,723	63,199
Service population ²	On-road transportation, community-wide MSW disposal	66,443	71,610	74,403	83,796	88,286

¹ Future job numbers assume a 1.1 percent increase in the number of jobs relative to 2015 levels.

² Per the method used by the San Luis Obispo Community Development Department, service population is equal to the residential population plus ½ the number of jobs.

Sources: City of San Luis Obispo Land Use and Circulation Element, City of San Luis Obispo Community Development Department, Economics & Planning Systems, US Census Bureau.

The forecasts also consider known relevant actions that will continue to reduce greenhouse gas emissions. There are three major policies that the City and the State have adopted to reduce GHG emissions at the local level:

- Renewables Portfolio Standard (RPS) and Community Choice Energy (CCE) participation: RPS requires that electrical providers supply an increased amount of their electricity from eligible renewable sources. At time of writing, a bill to revise the RPS (SB 100), has been passed by the California Legislature and signed by Governor Brown requiring that 33% of the electricity sold by a provider by 2020 be renewable, that 60% of electricity be renewable by 2030, and that 100% of all electricity must be carbon-free (although not necessarily renewable) by 2045. This analysis assumes that SB 100 fully implemented. Additionally, in December of 2018, the City of San Luis Obispo joined Monterey Bay Community Power (MBCP), a community choice energy program. Beginning in January of 2020, MBCP will be providing carbon free electricity to the

community. This forecast assumes that 2 percent of electrical load will opt to remain with PG&E.

- Title 24: This set of standards governs how new buildings must be constructed, including specifying minimum energy efficiency requirements. The standards are updated every three years to be more stringent. California’s zero net energy (ZNE) standards are included in Title 24. The included forecast also assumes that the City’s Clean Energy Choice Program has been implemented and that all new construction is either electric and carbon free or has offset its emissions in the existing built environment.
- Clean Car Standards: These standards require that cars sold in California meet minimum fuel efficiency requirements, and that vehicle and equipment fuel sold in the state emit less GHGs during production and use. The City used the 2035 emissions coefficient included in the EMFAC2014 modelling software, which includes assumptions about ongoing fuel efficiency and fuel carbon content improvements.

The City has calculated the effect of these three policies on San Luis Obispo’s emissions and with these three policies in place, San Luis Obispo’s future GHG emissions are expected to continue to decrease. As shown in Table 6.2, emissions in 2020 are projected to be 306,600 MTCO₂e (21 percent below 2005 levels), and in 2030 are expected to be at 275,730 MTCO₂e (29 percent below 2005 levels). In 2035, emissions with state policies in place are expected to be at 260,160 MTCO₂e, or 32 percent below 2005 levels.

Table 5.2 Forecasted GHG emissions with state reductions, 2005-2050 (MTCO₂e).

Sector	2005	2016	2020	2030	2035	Percent Change (2005-2035)
Transportation	225,390	212,980	198,210	161,290	142,830	-37%
Nonresidential Energy	58,050	44,270	30,430	33,690	27,720	-47%
Residential Energy	55,450	39,410	33,760	35,660	33,180	-39%
Solid Waste	47,740	42,630	44,890	49,880	52,560	10%
Total	386,630	339,290	307,290	280,520	256,290	-33%
Change from 2005		-12%	-21%	-29%	-33%	

6. AREAS FOR IMPROVEMENT

A greenhouse gas emissions inventory is only a partial snapshot of the total emissions occurring in a community. The report as presented includes emissions sectors and categories as required by global accounting protocol and represent those sectors that have defensible and transparent methods and data. As the City continues its path of climate action toward carbon neutrality, the following areas for improvement will be closely monitored:

- Energy in Water – The inventory presented in this report includes the energy required to move and treat water in the city. However, it does not estimate emissions from the conveyance of water from outside city limits to the city. Future inventories should identify a defensible method to account for these emissions.
- Green Waste – All of the organic waste that is collected in the city is processed by an anaerobic digester that yields clean electricity and compost. Previously, the community's green waste was trucked to a wind row composting facility in Santa Maria, CA or landfilled at Cold Canyon Landfill. The new approach is certainly reducing community emissions. However, there are no available defensible methods for estimating emissions from wind row composting, and therefore, no way to establish a baseline emissions level. The City will continue to monitor GPC work on composting methods and will include as a sector when available.
- Wastewater - The GPC requires local governments to account for direct process emissions that occur from the treatment of wastewater. It is known that the treatment of wastewater can release Nitrous Oxide and Methane, both of which are powerful greenhouse gases. Although the GPC provides accounting methods for estimating the direct release of emissions, an accounting protocol does not exist for the specific treatment type that occurs at the San Luis Obispo Water Resource Recovery Facility (nitrification, but no denitrification). Using an unvetted method, the City estimates these direct emissions to be approximately 200 MTCO_{2e} per year. Given the small size, this sector is not critical for planning purposes, but will be included when future updates to the GPC provide a defensible accounting method.
- Carbon Stocks and Sequestration – Greenhouse gas inventories do not need to evaluate existing carbon stocks or potential for sequestration, but these analysis can help the City understand how to better account for the existing value of these stocks and credit actions in the future that either preserve or enhance the amount of sequestered carbon. Sequestration, if included at all, is typically included in greenhouse gas inventories as an Given the amount of land area in the General Plan Conservation/Open Space, estimating the forestry and carbon stocks will be a meaningful part of a future inventory. As with the wastewater issue mentioned above, the City will monitor GPC updates for defensible accounting methods. Beyond that, the City is working with the cities of Vancouver B.C.,

San Francisco, and Boulder, CO to develop a tool for estimating emissions from carbon stocks and sequestration potential.

- Fugitive Methane – From the well head to the appliance, methane leaks directly into the atmosphere as the result of natural gas development and transmission. Some estimates of total system leakage are high enough to make natural gas consumption as bad a climate polluter as coal. A common protocol for amending the natural gas emissions coefficient to account for this leakage is not available. The City will consider updating the coefficient in future years when such information is vetted and available.
- Consumption - The inventory does not include the emissions that result from community consumption (e.g., consumption of food, clothing, packaging, etc.). Given the City's intent to work closely with the community in developing and implementing the climate action plan, it is important to recognize the greenhouse gas impacts created by the purchase and disposal of products and materials. Global climate action leadership cities are working on developing a standard protocol for inventorying consumption-based emissions. As with the other items in this section, the City will seek to include the sector when such a protocol is available. It should be noted that emissions from consumption may be significant, some cities estimate that consumption emissions increase their total inventoried emissions by more than 40 percent.
- Off-road equipment – Practices exist to account for emissions from lawn and garden and construction equipment. Using the Air Resources Board "OFFROAD" model, staff could estimate emissions from this voluntary sector in order lay a foundation for policy to reduce emissions from construction equipment and to reduce emissions from fossil fueled lawn and garden equipment.

List of Abbreviations

AB: Assembly Bill
ADT: Average daily trips
APCD: Air Pollution Control District
Caltrans: California Department of Transportation
CAP: Climate Action Plan
CARB: California Air Resources Board
CH₄: Methane
CO₂: Carbon dioxide
CO₂e: Carbon dioxide equivalent
DANF: Decomposable anaerobic fraction
DOC: Degradable organic content
EPA: US Environmental Protection Agency
GHG: Greenhouse gas
IPCC: Intergovernmental Panel on Climate Change
kW: Kilowatt
kWh: Kilowatt-hour
LGOP: Local Government Operations Protocol
MSW: Municipal solid waste
MTCO₂e: Metric tons of carbon dioxide equivalent
N₂O: Nitrous oxide
PG&E: Pacific Gas & Electric Company
RPS: Renewables Portfolio Standard
SB: Senate Bill
TDOC: Total degradable organic carbon
VMT: Vehicle miles traveled
WIPFRAC: Fraction of waste in place
WRRF: Water Resource Recovery Facility
ZNE: Zero net energy



CLIMATE ACTION PLAN

Appendix B: GHG Emissions Reductions Estimates & Basis for Quantification

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1. INTRODUCTION

Background

CEQA Guidelines Section 15183.5(b)(1) establishes criteria to guide the preparation of a “plan for the reduction of greenhouse gas emissions.” Subsection (D) notes that a CEQA Guideline consistent climate action plan must include, “measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.”

In support of achieving the City of San Luis Obispo City Council’s goal of carbon neutrality, the City has established greenhouse gas emissions sector specific goals and foundational actions to achieve them. The sector goals and the foundational actions were established through quantification estimates of programs at full implementation. These estimates and underlying calculations, provided in this report, show substantial evidence that there is a transparent and defensible approach to achieving the City’s greenhouse gas emissions reduction target.

To focus efforts on achieving the 2035 goal, City staff established six pillars of climate action: Lead by Example, Clean Energy Systems, Green Buildings, Connected Community, Circular Economy, and Natural Solutions. In February of 2019, the City partnered with Raimi + Associates to identify a quantified path to carbon neutrality by 2035. The Raimi + Associates team worked with staff, who has worked closely with the community, to identify actions within each of the pillars that are able to generate meaningful reductions in GHG emissions. Each pillar requires a “foundational action” to innovate, pilot ideas, and build support for programs that generate the magnitude, speed, and scale of GHG reductions needed to achieve the City’s goal. The quantification in this report is intended to illustrate one of several viable paths to pursue as these foundational moves are implemented and transition from pilots to fully implementable programs operating at the appropriate speed and scale.

The quantification in this report also provides substantial evidence that the City can achieve consistency with SB32’s target of 40 percent below 1990 by 2030.

The sector-specific goals are:

- **Pillar 1:** Lead by Example – Carbon neutral government operations by 2030¹
- **Pillar 2:** Clean Energy Systems –100 percent carbon free electricity by 2020
- **Pillar 3:** Green Buildings – No net new emissions from new buildings’ onsite energy use by 2020; 50 percent reduction in existing building onsite emissions by 2030
- **Pillar 4:** Connected Community – Achieve General Plan mode split objective by 2030; 40 percent of vehicle miles travelled by electric vehicles by 2030
- **Pillar 5:** Circular Economy – 75 percent diversion of landfilled organic waste by 2025 90 percent by 2035
- **Pillar 6:** Natural Solutions – Increase carbon sequestration on the San Luis Obispo Greenbelt and Urban Forest through compost application-based carbon farming activities and tree planting; ongoing through 2035

2. GHG REDUCTION ANALYSIS

This report presents an analysis of one GHG reduction pathway to achieve reductions consistent with and beyond those required for SB 32 and to establish a trajectory to achieve progress toward the 2035 goal of carbon neutrality. Raimi + Associates in partnership with the City used a tool developed internally to evaluate the GHG reductions of various measures and to determine the magnitude with which the measures must be implemented in order to achieve emission reduction goals. The reduction measures reflect adopted state regulations, local policy, and documented industry best practices for achieving deep decarbonization. The measures are applied individually to identify which measures are most impactful for each climate action pillar and then combined to determine the total emissions reductions that can be achieved.

Based on this analysis, combined annual reductions from existing state law and participation in Monterey Bay Community Power is expected to result in an annual reduction of 39,010 MTCO_{2e} in 2035. The combined local reductions from the remaining pillars can result in an annual reduction of 98,200 MTCO_{2e} in 2030 and 145,260 MTCO_{2e} in 2035. This represents a total reduction in annual greenhouse gas emissions of 204,330 MTCO_{2e} in 2030, or 53% from the 2005 baseline, and 275,600 MTCO_{2e} in 2035, or 71% from the 2005 baseline with a remaining gap of 111,030 MTCO_{2e}.

While not true zero, the total reduction that can be achieved across the six pillars by applying established measures that are within the City's authority or influence shows the massive potential for the City reduce its greenhouse gas emissions, while currently creating healthier homes, safer streets, a more active and engaged citizenry, and stronger connections to regional ecosystems. It also illustrates that if true carbon neutrality is to be achieved, substantial support from the federal government and the State of California is required.

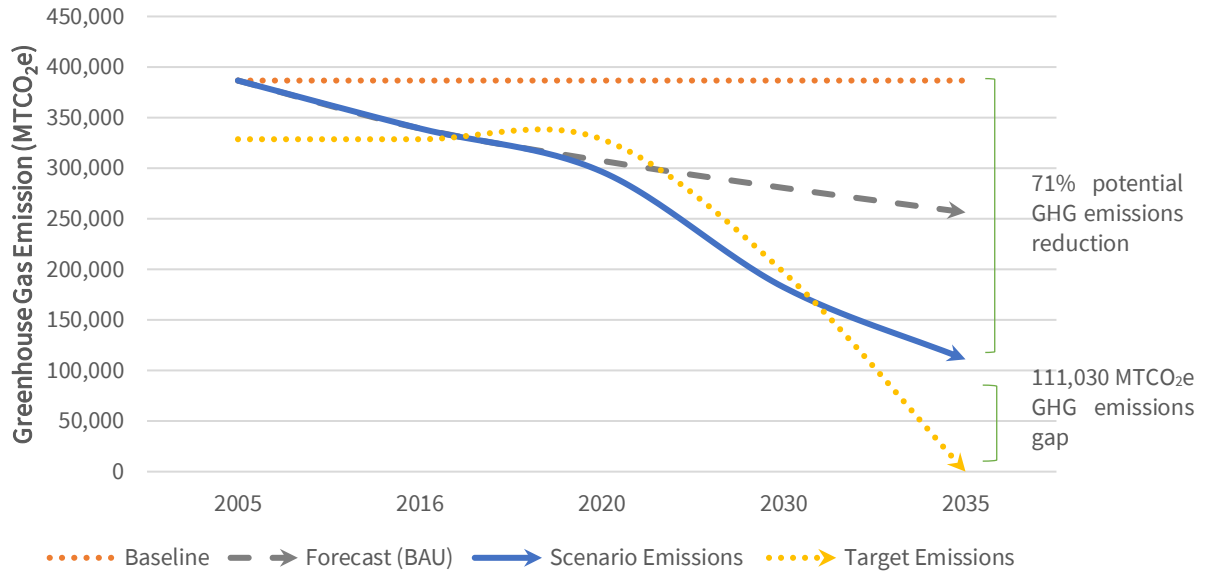
Analysis Approach

The analysis for each of the six pillars of climate action that is outlined in the following pages includes:

- Description of baseline conditions
- Description of the applicable strategies for achieving GHG reductions
- A summary of the measures selected and the magnitude of application
- Summary of the impact that the specific pillar has on the overall GHG profile of the City in 2035.

Limitations and uncertainties regarding future trends in technology, behavior, and social norms are discussed in the final section of this analysis. Given time and the increasing shifts in financial markets, private industry, and governmental programs towards carbon reduction programs, these shifts may be able to help close the gap between San Luis Obispo's projected GHG reductions and true carbon neutrality.

Figure 1. Projected Community GHG Emissions, 2005-2035



2.1 Lead by Example

The “Lead by Example” pillar is focused on achieving carbon neutrality in the City’s municipal operations, which include emissions inside and outside of the City of San Luis Obispo City Limits. The quantified reduction estimates for this pillar will be included in the municipal climate action plan and are not counted in the community climate action plan.

2.2 Clean Energy Systems

Background

This analysis explores the impact of using carbon-free grid-based electricity in the City of San Luis Obispo. Like the State, energy decarbonization is essential to help San Luis Obispo achieve its climate goals as it has cross-sectoral impacts on buildings and transportation.

The analysis tool evaluated the greenhouse gas emissions reductions that occur as the result of procuring carbon free energy through joining the community choice aggregation energy (CCE) program administered by Monterey Bay Community Power. Because the quantity of electricity consumed is an important variable, and because it is assumed that some percentage of the community will choose to stay with PG&E, the calculations for this pillar include information about increasing energy efficiency through triennial updates to the California Building Code and state law regarding the carbon content of PG&E’s electricity portfolio. Since the City has already enrolled in the program and is receiving service as of January 2020, the reduction estimates are treated as avoided emissions in the adjusted forecast. Following is a description of the magnitude of implementation and resulting GHG emissions reductions projected by 2035.

GHG Reduction Measures + Assumptions

1. **Clean Energy Supply:** San Luis Obispo joined the Monterey Bay Community Power (MBCP) community choice aggregation program in 2018 and began service

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Appendix B – GHG Emissions Reductions Estimates & Basis for Quantification

in January 2020. CCEs are a way for government agencies to buy and/or generate cleaner electricity for residents and businesses. CCEs create a partnership between a municipality and its existing utility provider, giving communities the option to purchase carbon-free electricity from other sources while working with the utility to deliver energy to customers at competitive rates.

The GHG analysis assumes that customers opt-in to MBCP at a rate of 98% for residential customers and 97% for non-residential customers. The analysis also assumes a very low intensity emissions coefficient for MBCP based on recent IRP filings with a downward trajectory to full neutrality by 2035.

GHG Emissions Analysis Results

The measures included in the Carbon-Free Energy sector result in a reduction of 26,050 MTCO_{2e} in 2030 and 39,010 MTCO_{2e} in 2035, as shown in Table 1.

Table 1. Measures and GHG Emissions for Clean Energy Systems

	2030	2035
Projected residential electricity (kWh)	79,178,790	79,178,790
Opt out rate (%)	2%	2%
Projected MBCP residential kWh	77,595,214	77,595,214
Projected PG&E residential kWh	1,583,576	1,583,576
Projected nonresidential electricity (kWh)	187,482,010	187,482,010
Opt out rate (%)	3%	3%
Projected MBCP nonresidential kWh	181,857,550	181,857,550
Projected PG&E nonresidential kWh	5,624,460	5,624,460
Projected MBCP Coefficient (MTCO_{2e}/kWh)	0.00004	0.00000
Projected PG&E Coefficient (MTCO_{2e}/kWh)	0.000112	0.000112
Projected MBCP Emissions (MTCO_{2e})	10,380	0
Projected PG&E Emissions (MTCO_{2e})	810	810
Total Emissions (MTCO_{2e})	11,190	810
Emissions w/out RPS or MBCP (MTCO_{2e})	37,790	39,900
Emissions Savings from Title 24 Electricity (to avoid double counting) (MTCO_{2e})	550	80
Emissions reductions (MTCO_{2e})	26,050	39,010

Source: Monterey Bay Community Power. (2018). Integrated Resources Plan. Accessed from: https://www.mbcommunitypower.org/wp-content/uploads/2019/06/MBCP-IRP_LSE-Plan_v3_Final.pdf.

2.3 Green Buildings

Since the City joined Monterey Bay Community Power, which provides carbon-free electricity, emissions associated with electricity use in buildings have been reduced to nearly zero. The remaining opportunities are to reduce natural gas use through energy efficiency or to remove the gas-burning equipment. Since electricity emissions have been reduced through Monterey Bay Community Power (MBCP), emissions reductions from energy efficiency have only been applied to natural gas use.ⁱⁱ It should be noted that even though participation in MBCP negates the GHG reductions from electricity energy efficiency and installation of local solar PV resources, these strategies provide multiple sustainability benefits including electric grid stability, local resiliency, improved indoor air quality, energy cost savings, and protection from utility rate volatility.ⁱⁱⁱ

The energy efficiency strategies included in the GHG analysis are building electrification, local clean energy generation, building benchmarking, retrocommissioning and retrofits, and increased stringency of the California Building Standards Code Part 6: Building Energy Efficiency Standards through continued adoption of local reach codes. The following is a description of the measures included in the analysis, the magnitude of implementation, and resulting GHG emissions reductions in line with the City's goal.

GHG Reduction Measures + Assumptions

- 1. Building Electrification:** Building electrification is the process of replacing fossil fuel end uses in existing residential and nonresidential buildings with electric alternatives. Electrification switches building systems and appliances used for space heating, water heating, cooking, and clothes drying from natural gas to electricity. The 2019 California Energy Efficiency Action Plan highlights the growing consensus that electrification is the most-viable and least-cost path to zero-emission buildings.^{iv} Building electrification can reduce GHG emissions when coupled with a decarbonized electricity supply such as the carbon-free energy supplied by MBCP. For locations with access to 100% carbon-free energy, removing natural gas from buildings will generate a 100% reduction in GHG emissions, but will increase electricity usage. This measure is only applied to existing buildings as new construction electrification is encouraged by the adoption of local building reach code.
- 2. Commercial Benchmarking:** Benchmarking is the practice of measuring and comparing energy use of a single building, relative to similar buildings or a building standard, with the goal of informing building owners and motivating improved performance over time. According to the California Energy Commission's (CEC) Options for Energy Efficiency in Existing Buildings report, commercial benchmarking results in 0.13kWh/SF/year and 0.002 therms/SF/year savings.^v The CEC report also notes that the voluntary adoption rate for this measure is only 20-25% of eligible buildings. This scenario assumes 100% participation by eligible buildings, which would require a mandate.
- 3. Retrocommissioning:** Retrocommissioning is the practice of applying commissioning, the process of ensuring that building systems are designed, installed, functionally tested, and being operated and maintained according to the owner's operational needs, to existing buildings. The California Energy Commission found that retrocommissioning of commercial buildings accounts for 1.3 kWh/SF/year and 0.065 therms/SF/year savings

and that residential retrocommissioning saves 328kWh and 74 therms per residential dwelling unit per year.^{vi}

4. **Building Retrofits:** Energy efficiency retrofits involve modifications to the existing building envelope or systems that improve energy efficiency and/or decrease energy demand. The GHG analysis tool assumes that the following efficiency packages are implemented as part of the retrofit measure:

Residential

- Home energy assessment
- Insulation under the raised floor, above the roof deck and at all walls,
- Replacement of existing single pane windows with double pane product,
- Envelope sealing,
- New ductless high efficiency mini-split heat pump,
- New heat recovery ventilation system for mechanical ventilation, and
- Installation of a one-switch load control device.

Commercial^{vii}

- Install occupancy sensors,
- Add daylight harvesting,
- Re-circuit and schedule lighting system by end use,
- Retrofit interior fixtures to reduce lighting power density by 13%,
- Retrofit exterior fixtures to reduce lighting power density, and add exterior lighting control,
- Remove heat from front entry,
- Widen zone temperature deadband (replace pneumatic thermostats), and
- Lower VAV box minimum flow setpoints (rebalance pneumatic boxes).

According to the California Energy Commission's Large Scale Residential Retrofit Program, residential retrofits save 570kWh and 53 therms per unit per year.^{viii} According to the United States Department of Energy Advanced Energy Retrofit Guides, the commercial retrofit package presented above for small to medium office and retail buildings reduces total energy use by approximately 33%. Adding retrocommissioning to the package nearly doubles the energy savings.^{ix}

5. **Reach Code:** Local jurisdictions can establish building energy performance requirements above the baseline California Building Standards Code. The baseline code is updated triennially to help California achieve its climate goals and to reflect changes in building technologies. The State has adopted the goal of carbon neutral buildings by 2030. The emissions reductions associated with these triennial updates have been built into the analysis tool.

The City of San Luis Obispo is currently pursuing the Clean Energy Choice Program for New Buildings, which states that new construction all-electric buildings must meet the baseline code efficiency requirements, while mixed-fuel buildings must be more efficient than code by 9 Energy Design Rating points for residential and 8-15% more efficient for nonresidential. Since electric-preferred reach codes will not be implemented until 2020, there is no data on how the construction industry will respond to the requirements nor the

proportion of buildings that will be built as all-electric. According to Monterey Bay Community Power’s Electrification Strategic Plan, market saturation for residential electric building systems such as space heating is low, about 12-15% and for cooktops is about 25%.^x However, all-electric design uptake is expected to be swift and the City’s program includes incentives, regulations, and an offset program. As such, this analysis assumes that 95% of new buildings built in 2030, and 100% in 2035.^{xi}

GHG Emissions Analysis Results

The measures included in the Green Buildings sector result in a reduction of 11,960 MTCO_{2e} in 2030 and 26,740 MTCO_{2e} in 2035, as shown in Table 2.

Table 2. Measures and GHG Emissions for Green Buildings

	2030	2035
Commercial electrification retrofits (Cumulative Participating Buildings)	629	1,183
Natural gas reduction/ft ² (Therms) ^{xii}	0.3	0.3
Projected emissions reduction (MTCO _{2e})	670	870
Residential electrification retrofits (Cumulative Participating Buildings)		
Natural gas reduction/unit (Therms) ^{xiii}	257	257
Projected emissions reduction (MTCO _{2e})	4,170	13,540
Commercial Benchmarking		
Natural gas reduction ^{xiv} /ft ² (Therms)	0.002	0.002
Electricity reduction/ft ² (kWh)	0.13	0.13
Projected emissions reduction (MTCO _{2e})	40	120
Commercial retrocommissioning (Cumulative Participating Buildings)		
Natural gas reduction ^{xv} /ft ² (Therms)	0.065	0.065
Electricity reduction/ft ² (kWh)	1.30	1.30
Projected emissions reduction (MTCO _{2e})	530	820
Residential Retrocommissioning (Cumulative Participating Buildings)		
Natural gas reduction ^{xvi} /unit (Therms)	74	74
Electricity reduction/unit (kWh)	328	328
Projected emissions reduction (MTCO _{2e})	990	1,530
Commercial retrofits (Cumulative Participating Buildings)		
Energy use reduction ^{xvii} (%)	33%	33%
Projected emissions reduction (MTCO _{2e})	950	1,710
Residential retrofits (Cumulative Participating Buildings)		
Natural gas reduction ^{xviii} /unit (Therms)	53	53

Electricity reductions/year (kWh)	570	570
Projected emissions reduction (MTCO₂e)	830	1,900
Commercial all-electric new construction (Cumulative Participating Square Footage)		
	2,181,258	3,425,753
Therm reduction per square foot^{xxix}	0.07	0.07
kWh addition per square foot^{xx}	0.67	0.67
Projected emissions reduction (MTCO₂e)	760	1,200
Residential all-electric new construction (Cumulative Participating Units)		
	2,622	4,129
Therm reduction per unit^{xxxi}	230	230
kWh addition per unit^{xxii}	3,232	3,232
Projected emissions reduction (MTCO₂e)	3,020	5,050
Emissions Reductions (MTCO₂e)	11,960	26,740

2.4 Connected Community

Background

Transportation related GHG emissions can be reduced through two main strategies: 1) reduction of vehicle miles traveled (VMT) and 2) vehicle electrification. Shifting trips to lower-emission options (carpool and bus) or zero-carbon options (walking and biking) reduces the VMT of single-occupancy vehicles, traditionally the most carbon-intensive mobility option. Beyond GHG emissions reductions, reductions in VMT provide multiple co-benefits such as improved air quality, transportation-related physical activity, less traffic congestion, increased cyclists and pedestrian safety, and support for the creation of human-scale bike and pedestrian priority streetscapes and districts.

The second option is to transition to electric vehicles, which leads to direct GHG emissions reductions, as electric vehicles in San Luis Obispo can be charged with 100% carbon-free energy.

California’s 2016 ZEV Action Plan set the goal of 5 million EVs in California by 2030. While an aggressive goal, the EV market continues to grow and in 2018 constituted 5% of new car sales.^{xxiii} Based on data from the California Plug-In Electric Vehicle Infrastructure Projections: 2017-2025 report, the current EV adoption rate in San Luis Obispo County is about 0.66%.^{xxiv} The rate of EV adoption is likely somewhat higher in the City of San Luis Obispo as compared to the County, because the City population features many of the factors that determine the propensity to buy an EV such as higher household incomes, higher levels of educational attainment, and higher levels of environmental awareness.^{xxv}

The strategies included in the GHG analysis tool for transportation are electric vehicle (EV) adoption, electrification of the transit fleet, and mode shift from on-road vehicles to active transportation and transit. The analysis is based on the City’s current transportation patterns in terms of mode share and VMT, projected vehicle miles traveled (VMT) as generated by the City’s transportation demand model. GHG reductions are determined based on the mode share objectives and the policies in the Circulation element of the General Plan. The analysis also

incorporates the emissions reductions projected to result from state policies and regulations related to vehicle fuel efficiency.

GHG Reduction Measures + Assumptions

1. **EV Adoption:** EV adoption is a critical component of transportation GHG emissions reductions. Transitioning vehicles from fossil fuels to clean electricity is an impactful strategy to reduce transportation related GHG emissions. Since San Luis Obispo supplies carbon-free electricity from MBCP, electric vehicles charged within the City are essentially zero-emission. Over time, shifting some VMT to EVs to create an increasing amount of “clean VMT” has the effect of gradually reducing the overall GHG intensity of VMT. EVs currently account for less than 1% of total vehicles registered in the County,^{xxvi} so achieving a significantly higher rate requires a combination of infrastructure investments, reductions in the price of EVs, manufacturers producing high quality and cost comparable models, programs that enable access to EVs for low and moderate income households, and electricity tariffs that make total cost of ownership cheaper than fossil fuel vehicles. However, rapid advances in technology are putting EV usage on an aggressive adoption curve; the most recent electric vehicle outlook published by Bloomberg NEF notes, “By 2040 we expect 57% of all passenger vehicle sales, and over 30% of the global passenger vehicle fleet, will be electric.”^{xxvii} In 2019, there were approximately 200,000 registered light duty vehicles and 67,000 trucks registered in San Luis Obispo County.^{xxviii} The 22,289 new electric and plug-in hybrid electric vehicles identified in Table 3 represent under 10 percent of the total passenger fleet in 2016 and will represent an even lower total in 2035.

2. **Mode Shift:** Mode shift is the switch away from traveling in single occupancy vehicles to using other modes such as active transportation, transit, and carpool. GHG analysis assumes that mode share stated in the Circulation Element of 12% transit, 20% bike, 18% walking and carpool, and 50% single-occupant vehicles.

GHG Emissions Analysis Results

The measures included in the decarbonized transportation sector result in a reduction of 45,240 MTCO_{2e} in 2030 and 64,170 MTCO_{2e} in 2035, as shown in Table 3.

Table 3. Measure and GHG Emissions for Connected Community

	2030	2035
New Electric and Plug-in Hybrid Electric Vehicles (cumulative, inclusive of residents and regional commuters)	12,670	23,652
EV and Plug-in Hybrid VMT	94,321,187	168,610,303
Emissions reduction/EV VMT (MTCO_{2e})	0.00031	0.00026
Emissions reduction/Plug-in Hybrid VMT (MTCO_{2e})	0.00011	0.00009
Projected emissions reduction (MTCO_{2e})	22,180	34,920
Carpool Mode Share		
Carpool Mode Share	23%	23%
Carpool Trips	2,958,069	3,446,971
Emissions reduction/trip (MTCO_{2e})	0.0017	0.0015
Projected emissions reduction (MTCO_{2e})	5,100	5,100
Transit Mode Share		
Transit Mode Share	7%	12%

Transit trips	3,095,474	5,918,352
Emissions reduction/trip (MTCO_{2e})	0.0017	0.0015
Projected emissions reduction (MTCO_{2e})	5,340	8,750
Active Transportation Mode Share		
	20%	25%
Walk + bike trips	7,319,928	10,419,143
Emissions reduction/trip (MTCO_{2e})	0.0017	0.0015
Projected emissions reduction (MTCO_{2e})	12,620	15,400
Emissions Reductions (MTCO_{2e})		
	45,240	64,170

2.5 Circular Economy

Background

Organic materials are the focus of the recent landmark legislation SB 1383 (Short-Lived Climate Pollutants: Organic Waste Reductions). Now in the final rulemaking stage, this new state law has the immediate goal of reducing organic waste sent to landfill and the ultimate objective of reaching statewide methane emissions reduction targets. Specifically, it sets a statewide goal for the reduction in organic waste to landfills – 50% by 2020 and 75% by 2025 – in addition to the recovery of 20% of edible food waste for human consumption. SB 1383 will require local governments to provide organics collection to all generators, and all generators to subscribe. It also has specific mandates for container systems, education and outreach programs, monitoring and contamination reporting, and enforcement of regulations. Full SB 1383 implementation will begin in 2022, allowing some time for jurisdictions to plan and prepare for achieving compliance.^{xxix}

The City, the San Luis Obispo Integrated Waste Management Authority, and the local hauler, San Luis Garbage, must work together to comply with the various state laws, in addition to SB 1383, regulating solid waste services. AB 32 recognizes solid waste as a contributor to greenhouse gas emissions and set the goal to reduce greenhouse gas emissions to 1990 levels by 2020. AB 341 Mandatory Commercial Recycling (2012) and AB 1826 Mandatory Commercial Organics Recycling (2014) place waste diversion program participation requirements on commercial and multi-family properties. AB 341 and AB 1826 also increased statewide goals to 75 percent diversion for recycling and 50 percent reduction of organic waste by 2020.

San Luis Obispo has already started to build out the infrastructure to achieve zero waste. On November 18, 2018, the Kompogas SLO dry anaerobic plant was opened. The plant, built by Hitachi Zosen Inova, is currently accepting material that is then turned into methane (combusted to generate electricity) and soil amendments (compost and liquid). The facility has the following capacity:

- Permitted TPW: 700 tons per week
- Maximum Permitted Capacity: 36,500 tons per year

Estimates of GHG emissions reductions for this pillar focus on the direct benefit of diverting 75% of the community' organic waste from the landfill to the anerobic digester consistent with SB 1383 by 2030 and a stretch goal of 90% by 2035.

GHG Emissions Analysis Results

The quantification estimates result in a reduction of 37,410 MTCO₂e in 2030 and 47,300 MTCO₂e in 2035, as shown in Table 4.

Table 4. Measures and GHG Emissions for Circular Economy

	2030	2035
Projected annual emissions from organic decomposition/fugitive emissions (MTCO₂e)	49,884	52,557
Organic diversion rates	75%	90%
Reduction in annual emissions from organic decomposition/fugitive emissions (MTCO₂e)		
	37,410	47,300

2.6 Natural Solutions

Background

San Luis Obispo has a unique opportunity to engage in sequestration activities, due to the combination of access to both protected open space and suitable composted organic material to apply to these open spaces. Approximately 4,000 acres of open space are owned and managed by the City, as part of the larger regional greenbelt. Of this area the City has determined that approximately 400 acres are currently accessible and of a low enough slope to be suitable for compost application. Additional areas for compost application include other protected greenbelt properties located in the County that the City could use through a partnership agreement. The City operates a biodigester that processes organic material to produce biomethane and compost. The composted material is suitable for application to the City owned open space areas, thus creating a well aligned source-sink relationship. The application of compost allows for carbon to be stored in the soil and, over time, to be captured in the stems, leaves, and roots of grasses, woody plants, and trees.

Other opportunities for sequestration are in the City’s urban forest and protected riparian areas. The current urban forest stock consists of approximately 20,000 trees. A rough estimate of total amount of greenhouse gases that are captured in the urban forest is 14,680 MTCO₂e. This amount is in the City’s current stock and cannot be counted as a GHG reduction measures. The goal is to maintain the amount and health of the current tree stock and then add trees to increase the carbon storage capacity of the urban forest. Assuming that the urban forest is not 100 percent stocked, which is typical even of communities that have well-managed forests such as Santa Monica, there is likely the ability to increase the size of the urban forest by 15% - 25%, or to add 3,000 – 5,000 additional trees. If a more aggressive tree planting program were to be implemented that included tree planting in parks and other City owned properties combined with encouraged planting on private property, an additional 5,000 trees could be added for a total of approximately 10,000 additional trees. San Luis Obispo also features several creeks that run through the City that are largely unchannelized condition. There is existing vegetation and riparian habitat, albeit somewhat degraded, that could be restored and enhanced with additional native trees and woody shrubs. The additional biomass created by the restoration and enhancement efforts would also contribute to the City’s overall GHG reductions through biological sequestration.

GHG Reduction Measures + Assumptions

1. **Compost Application/Carbon Farming:** Application of biomass such as compost or biochar onto open lands in areas that will not be disturbed. The analysis assumes a total of 1,260 acres are designated for this measure by 2035. The COMET Planner GHG factor for grassland is used as this is assumed to be the best fit for areas that include both grasses and small woody shrubs.
2. **Urban Forestry:** This measure assumes an increase of 10,670 trees to the existing urban forest by 2035. The carbon capture factor for mixed hardwoods is applied for a 20-year growing period.
3. **Creek Restoration:** This measure assumes that 2 miles of creeks within the San Luis Obispo City limits are restored and that the riparian area has an average width of 50 feet, resulting in a total of 12 acres of restored area. Based on the output of the CREEC model developed by the California Department of Conservation, if these riparian areas were to be restored with a combination of common riparian trees and woods shrubs a mix of (20% sycamore, 20% black walnut, 20% oak, 20% bay laurel, and 20% poison oak was assumed), a total of 62.95 Mg C/hectare would be captured by 2035. For the 12-acre potential restoration area and converting from C to CO₂ this results in a total sequestration potential of 1,123 MTCO₂.

GHG Emissions Analysis Results

The measures included in the Sequestration sector result in a reduction of 3,610 MTCO_{2e} in 2030 and 7,060 MTCO_{2e} in 2035, as shown in Table 5.

Table 5. Measures and GHG Emissions for Natural Solutions

	2030	2035
Number of trees planted (cumulative)	7,337	10,672
Emissions reduction per tree (MTCO_{2e})	0.0354	0.0354
Annual GHG reductions (MTCO_{2e})	260	380
Acres of compost applied (cumulative)		
	760	1,260
Emissions reduction per acre (MTCO_{2e})	4.41	4.41
Annual GHG reductions (MTCO_{2e})	3,350	5,560
Miles of creek restoration (cumulative)		
		2.00000
Emissions reduction per mile (MTCO_{2e})	<i>Method described above</i>	
Annual GHG reductions (MTCO_{2e})		1,120
Emissions reductions (MTCO_{2e})		
	3,610	7,060

3. UNCERTAINTIES + OPPORTUNITIES

There are several factors that are uncertain or unknown. These can have a significant impact on the ability on the City's ability to achieve the final 15% -20% of GHG reductions needed to achieve neutrality:

Transportation

Rate of EV adoption. Estimates of the rate of EV adoption over the next fifteen years vary widely. What is needed to achieve statewide GHG reduction goals for vehicles range from the 5 million stated by Governor Brown's ZEV Action Plan to the 6 million in the CEC Deep Decarbonization report.^{xxx} Estimates of the number of vehicles that will actually be on the road in the State depend on assumptions including the future cost of vehicles, extension of current or existence of future tax incentives or other rebates, access to charging facilities to decrease consumer hesitancy regarding purchases, and the development of lease, subscription or other financial structures.

Overall car ownership. Current trends show that millennials are less likely to own cars and more likely to use public transportation or cycle than previous generations.^{xxxi} It is unknown whether this trend will continue as millennials age, start families, and move from dense urban areas to more suburban or rural locations.

Acceptance and market share of autonomous vehicles. If shared and powered by renewable electricity autonomous vehicles could be instrumental in reducing GHG emissions and the total number of vehicles in San Luis Obispo. This advancement could result in changes to land use, zoning, and parking standards in order to allow for slightly higher development density as a result of less space needing to be allocated to parking. Acceptance of autonomous vehicles by consumers, City officials, and residents is uncertain, especially as some early efforts to deploy autonomous vehicles have experienced challenges with integrating with current street designs and driver behaviors.^{xxxii} There is also a risk that autonomous vehicles are fossil fuel driven and privately owned, which would not contribute GHG emissions reduction and could lead to an increase in trips and Citywide VMT.

Employee work culture and travel patterns. With the rapid growth in mobile technologies and the ability to access the internet remotely, there is the potential for employees to conduct their work-related tasks at home or at shared work facilities close to home, through telepresence, rather than commute to a central office. This has the potential to reduce the number of work-related trips and associated VMT. The City has limited ability to influence these trends, through transportation demand management (TDM) policies, so the degree to which remote work options are offered is determined by individual employers. However, this is a regional issue that SLOCOG could explore further.

Implementation of SB 743. This bill requires a shift in transportation impact analysis from Level of Service (LOS) to Vehicle Miles Traveled (VMT), as well as greenhouse gas reductions and support for active transportation. While the analysis methods are being developed for determining impacts from a CEQA perspective, there is still uncertainty regarding how mitigation measures will be identified. Previously most mitigation measures were focused on the area in proximity to the proposed project, to reduce congestion and decrease in LOS. Using VMT as the measurement of impact creates the possibility of mitigation measures occurring in more distant locations for items such as removing a gap in the bicycle network or on non-roadway items such as improving transit facilities or reducing bus headways. The feasibility and legality of VMT driven mitigations that focus on reducing GHG emissions and/or promoting active transportation, rather than solving localized roadway issues, will need to be defined as this shift in practice is put into place in the coming years.

Willingness to prioritize biking and walking. The current roadway system in San Luis Obispo is designed primarily to accommodate private vehicles. There are ongoing local examples of bike-priority streets, protected bikeways, trails, paseos, and plazas that serve the needs of pedestrians and cyclists. The reduction estimated in this analysis depends on an equitable allocation of public rights of way among the various travel modes, so that biking, walking, and transit use are presented as equally viable and important methods of transportation. Furthermore, there is the potential to establish certain streets and corridors as bike-priority or bike/ped-only and to implement a comprehensive bus rapid transit network on 2-4 major boulevards in the City. The City could explore these options more fully in its update of the Active Transportation Plan and future strategic transit planning efforts.

Future of Corporate Average Fuel Economy (CAFE) Standards. The current federal government administration is actively opposing climate action and is decidedly anti-environment. As such, the White House has proposed to weaken the federal fuel-economy standards set by previous administrations administration and has taken action to revoke California's ability to set its own environmental laws. This legal challenge could have significant adverse impacts on vehicle fuel efficiency throughout the State but will most likely remain undecided as it progresses through the judicial system.

Statewide Housing Law. The California Legislature has recently considered dozens of bills related to housing production. Although the bills cover many different topics, it is likely that the state will create conditions that expand housing production, which could affect emissions from regional trips.

Energy + Energy Use

State building code updates to require carbon neutrality. California's energy efficiency laws will continue to drive significant improvements in building efficiency, particularly for new buildings. The State's goal is for near-zero net energy new construction by 2020 for residential buildings and 2030 for commercial properties. It is unknown whether the State regulations will go into effect along their stated timeline.

CCA participation rate persistence. As discussed above, CCAs are a new development within the energy sector in California; not much data is available on which to base future assumptions. Current trends in the industry suggest that CCAs will continue to be a viable alternative to traditional investor-owned utilities (IOUs). For example, the State's first CCA, Marin Clean Energy, established in 2010, continues to expand their service area and successfully procure and distribute clean electricity. Furthermore, the number of CCAs

across California continues to increase. There are now 19 CCAs that are projected to serve over 10 million customers.^{xxxiii} Furthermore, considering the recent Public Safety Power Shutoffs and PG&E’s pending bankruptcy, there is significant uncertainty in the electricity utility landscape.

Other Uncertainties

Ability to account for land sequestration outside of the City’s Green Belt. Expanding sequestration efforts from the 400 identified acres to larger areas would significantly increase emissions reduction capacity. However, accounting and reporting methods for out of boundary emissions reductions are currently under development and will not be ready for inclusion in this report. Should the City be able to support sequestration or regenerative agriculture in regional rangeland or farmland, potential additional reductions could be substantial.

Regional collaboration. Regional collaboration is a difficult tool to employ but can have wide-reaching GHG implications. Many of the high GHG intensity development patterns cannot be corrected without coordination among jurisdictions throughout the County. However, the level of willingness for cross-jurisdictional willingness and capacity to collaborate on future patterns of growth, land use, and transportation is currently unknown.

Although the GHG analysis demonstrates that San Luis Obispo is not able to achieve carbon neutrality by 2035, the City is well positioned to proceed down the pathway to carbon neutrality. The City has a relatively compact urban form, a local and regional bus system, rail service, examples of appropriately scaled density, participation in a community choice aggregation option to receive grid-delivered renewable energy, and publicly owned open space that could be used for carbon farming or forms of biological carbon sequestration. The City also has an appetite for innovation as evidenced by the biodigester, EV charging station, and photovoltaic installations. As the future of climate action in California becomes clearer in the next decade, answers to many of the uncertainties presented above could help San Luis Obispo close its remaining GHG gap and reach carbon neutrality within its timeframe. Additionally, having a carbon neutrality framework in place will allow the City to capitalize on private foundation investments and federal and state funding sources as they become available.

ⁱ The “Lead by Example” pillar’s reductions are for municipal operations, which include emissions inside and outside of the City of San Luis Obispo City Limits. The quantified reduction estimates for this pillar will be included in the municipal climate action plan and are not counted in the community climate action plan.

ⁱⁱ The proportion of natural gas use in buildings was determined using building energy use data from San Luis Obispo’s 2016 GHG inventory. In residential buildings, natural gas use accounts for 68% of total building energy use, while electricity accounts for the remaining 32%. In commercial buildings, natural gas use accounts for 43% of total building energy use, while electricity accounts for the remaining 57%.

ⁱⁱⁱ Kenney, M et al. (2019).

^{iv} Kenney, Michael, Heather Bird, Heriberto Rosales, and Antonio Cano. (2019). *2019 California Energy Efficiency Action Plan*. California Energy Commission. Publication Number: CEC-400-2019-010-SD.

^v California Energy Commission. (2005). *Options for Energy Efficiency in Existing Buildings*. Accessed from: <https://www.m.gosolarcalifornia.org/2005publications/CEC-400-2005-039/CEC-400-2005-039-CMF.PDF>.

^{vi} California Energy Commission. (2017). *Large Scale Residential Retrofit Program*. Accessed from: <https://ww2.energy.ca.gov/2017publications/CEC-500-2017-009/CEC-500-2017-009.pdf>.

^{vii} This package combines measures from the Department of Energy’s office building and retail building retrofit guides. See endnote 18.

- viii California Energy Commission. (2017) and Department of Energy. (2011). *Advanced Energy Retrofit Guide for Office Buildings*. Accessed from: https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20761.pdf; Department of Energy. (2011). *Advanced Energy Retrofit Guide for Retail Buildings*. Accessed from: https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20814.pdf.
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- x Monterey Bay Community Power. (2019). Electrification Strategic Plan. Accessed from: <https://mbcommunity.onbaseonline.com/1800AgendaAppNet/Meetings/ViewMeeting?id=251&doctype=1>.
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- xii Therm per square foot calculated by dividing total nonresidential therms by total nonresidential square footage for each calendar year.
- xiii Therm per residential unit calculated by dividing total residential therms by total residential units for each calendar year.
- xiv California Energy Commission. (2005).
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- xxx Mahone, Amber, Zachary Subin, Jenya Kahn-Lang, Douglas Allen, Vivian Li, Gerrit De Moor, Nancy Ryan, Snuller Price. (2018). *Deep Decarbonization in a High Renewables Future: Updated Results from the California PATHWAYS Model*. California Energy Commission. Publication Number: CEC-500-2018-012
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City of San Luis Obispo
California Environmental Quality Act (CEQA)
Greenhouse Gas (GHG) Emissions
Thresholds and Guidance

Final

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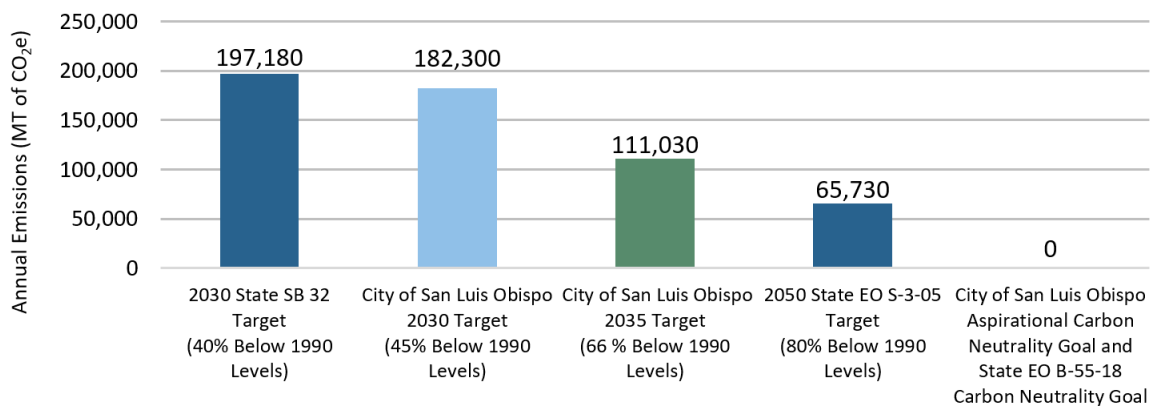
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1 Introduction

The California Environmental Quality Act (CEQA) requires discretionary plans and projects to undergo an environmental review process, which includes an evaluation of plan- or project-related greenhouse gas (GHG) emissions.¹ This GHG thresholds and guidance document is intended to provide methodological guidance and quantitative thresholds of significance for use by City planners, applicants, consultants, agencies, and members of the public in the preparation of GHG emissions analyses under CEQA for plans and projects located within the City of San Luis Obispo.

The City of San Luis Obispo (City) prepared a Draft Climate Action Plan (CAP) dated June 17, 2020 with the aspirational goal of carbon neutrality by 2035.² While the City Council, City staff, and community will continue to develop an approach to the long-term aspirational goal of carbon neutrality, the CAP includes specific actions to achieve the short-term communitywide emissions reduction targets of 45 percent below 1990 levels by 2030 and 66 percent below 1990 levels by 2035, which is consistent with California’s goal of reducing GHG emissions to 40 percent below 1990 levels (Senate Bill 32) by 2030. See Figure 1 for a representation of City and State GHG emissions reduction targets.

Figure 1 City of San Luis Obispo GHG Emissions Reduction Targets



The City’s 2030 target was developed to provide substantial progress towards the City’s long-term aspirational carbon neutrality target and contribute substantial progress toward meeting the State’s long-term GHG reduction goals identified in SB 32 and Executive Order (EO) B-55-18. Consistent with this process, the City’s CAP includes procedures to evaluate the City’s emissions in light of the trajectory of the CAP’s targets to assess its “substantial progress” toward achieving long-term reduction targets identified in the CAP and State legislation or EOs. The CAP also includes commitments and mechanisms to adopt additional policies to achieve further GHG emissions reductions necessary to avoid interference with, and make substantial progress toward, the long-

¹ Refer to Appendix A for an overview of GHG emissions and climate change.

² Carbon neutrality is defined as net zero carbon emissions, which is achieved either by balancing carbon emissions with carbon removal or by completely eliminating carbon emissions.

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term CAP and State targets. This is important because these targets have been set at levels that achieve California's fair share of international emissions reduction targets that will stabilize global climate change effects and avoid the adverse environmental consequences of climate change.

To support progress toward the City's long-term aspirational carbon neutrality goal, plans and projects within the City that undergo CEQA review will need to demonstrate consistency with targets in the CAP, which will be a Qualified GHG Emissions Reduction Plan, consistent with CEQA Guidelines Section 15183.5, upon adoption of its CEQA review document, specifically the CAP Initial Study-Negative Declaration (IS-ND), and approval of the CAP by City Council. Chapter 2, *Climate Action Plan Summary*, provides an overview of this plan and the associated GHG emissions inventories, reduction measures, and forecasts included therein. In addition, Chapter 3, *Regulatory and Legal Setting*, offers an overview of relevant regulations and case law pertaining to the analysis of GHG emissions consistent with CEQA and the CEQA Guidelines.

Plans and projects that are consistent with the CAP's demographic (i.e., residents and employees) projections and land use assumptions, which are based on the Land Use and Circulation Elements of the 2014 City General Plan, will be able to tier from the adopted CAP IS-ND pursuant to CEQA Guidelines Section 15183.5. To streamline this CEQA GHG emissions analysis process, the City has prepared a CEQA GHG Emissions Analysis Compliance Checklist that can be utilized in plan- and project-level CEQA review documents to ensure that such proposed plans and projects are consistent with the CAP GHG emissions reduction strategy. Chapter 4, *Determining Consistency with the City's C*, includes guidance on how to navigate this consistency determination process.

For plans or projects that are not consistent with the CAP's demographic projections and land use assumptions, a different methodology and assessment utilizing quantitative thresholds of significance would be necessary to evaluate GHG emissions impacts. Chapter 5, *Utilizing Quantitative CEQA GHG Thresholds*, includes guidance on how to utilize the specific quantitative thresholds that were developed for purposes of evaluating the level of significance of GHG emissions impacts.³ Furthermore, Chapter 6, *Quantifying GHG Emissions*, provides direction regarding how to quantify a plan or project's GHG emissions for comparison to the applicable threshold of significance.

The City's CAP acknowledges that additional actions beyond those identified in the plan will be required to achieve its long-term aspirational goal of carbon neutrality by 2035. As a result, the plan provides a mechanism for updating and adopting a new CAP every other financial plan cycle (i.e., in conjunction with the 2023-2025, 2027-2029, and 2031-2033 cycles) in order to incorporate new measures and technologies that will further move the City toward meeting its long-term aspirational carbon neutrality goal.⁴ Chapter 7, *Moving into the Future*, offers further explanation of how CEQA review of plans and projects could be affected by future updates and/or iterations of the CAP.

³ In compliance with CEQA Guidelines Section 15064.7(b), this guidance document and the quantitative thresholds contained herein will be presented to the City Council for formal adoption via resolution through a public review process, which will include an opportunity for public input.

⁴ San Luis Obispo, City of. 2019. *Carbon Neutrality Vision and Three-Year Strategic Plan Technical Report*. November 2019.

2 Climate Action Plan Summary

The following sections provide an overview of the City's CAP, including the 2005 and 2016 communitywide GHG emissions inventories, proposed GHG emission reduction strategy, and the communitywide GHG emissions forecast for years 2020, 2030, and 2035.

2.1 Communitywide GHG Emissions Inventories

The City has completed communitywide GHG emissions inventories for years 2005 and 2016, which are summarized in Table 1. Table 1 also provides estimated 1990 emissions levels for informational purposes. As shown therein, communitywide GHG emissions declined by approximately 12 percent between 2005 and 2016, which indicates substantial progress toward meeting or exceeding the City's target of reducing emissions by approximately 15 percent below 2005 levels by 2020 and the State's target of reducing emissions to 1990 levels (i.e., an approximately 15 percent reduction below 2005 levels) by 2020. The most significant changes occurred in the energy and solid waste sectors due to increasing decarbonization of the electricity grid, investments in energy efficiency, and a decrease in the amount of solid waste generated.⁵

Table 1 City of San Luis Obispo 1990, 2005, and 2016 Communitywide GHG Emissions Levels

Sector	1990 (MT of CO ₂ e) ¹	2005 (MT of CO ₂ e)	2016 (MT of CO ₂ e)	Percent Change from 2005 to 2016
Transportation	191,580	225,390	212,980	-6%
Non-residential Energy	49,340	58,050	44,270	-24%
Residential Energy	47,130	55,450	39,410	-29%
Solid Waste	40,580	47,740	42,630	-11%
Total	328,630	386,630	339,290	-12%

MT = metric tons; CO₂e = carbon dioxide equivalents

Note: Numbers are rounded to the nearest ten.

¹ AB 32 sets a target of reducing GHG emissions to 1990 levels by 2020, which is considered equivalent to a 15 percent reduction in baseline 2005 levels according to the CARB (2008) Climate Change Scoping Plan. Therefore, to estimate 1990 emissions levels, inventoried 2005 emissions from each sector were reduced by 15 percent.

Source: San Luis Obispo, City of. 2019. *Community Greenhouse Gas Emissions Inventory and Forecast*.

2.2 GHG Emission Reduction Strategy

To achieve the City's long-term aspirational goal of carbon neutrality by 2035, the City's CAP includes a series of pillars, measures, and foundational actions that are intended to reduce communitywide GHG emissions by approximately 66 percent below 1990 levels by 2035, which provides substantial progress toward meeting the City's long-term aspirational carbon neutrality goal while exceeding the State's goals. The CAP acknowledges that additional actions beyond those identified in the plan will be necessary to achieve the long-term aspirational goal of carbon neutrality and therefore provides a mechanism for updating and adopting a new climate action plan

⁵ San Luis Obispo, City of. 2019. *Community Greenhouse Gas Emissions Inventory and Forecast*.

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every other financial plan cycle in order to incorporate new measures and technologies that will further the City toward meeting its long-term aspirational goal of carbon neutrality.⁶

The City's CAP proposes the following six pillars, each of which include a long-term goal, measures, and foundational actions:⁷

- **Pillar 1: Lead by Example.** Create a Municipal Action Plan by 2020 and achieve carbon-neutral government operations by 2030.
- **Pillar 2: Clean Energy Systems.** Achieve 100 percent carbon-free electricity by 2020.
- **Pillar 3: Green Buildings.** Generate no net new building emissions from on-site energy use by 2020 and achieve a 50 percent reduction in existing building on-site emissions (after accounting for Monterey Bay Community Power) by 2030.
- **Pillar 4: Connected Community.** Achieve the General Plan mode split objective by 2030 and have 40 percent of vehicle miles travelled by electric vehicles by 2030.
- **Pillar 5: Circular Economy.** Achieve 75 percent diversion of landfilled organic waste by 2025 and 90 percent by 2035.
- **Pillar 6: Natural Solutions.** Increase carbon sequestration on the San Luis Obispo Greenbelt and Urban Forest through compost application-based carbon farming activities and tree planting to be ongoing through 2035.

Table 2 summarizes the GHG emissions reductions included in the the CAP that are anticipated to be achieved by each of these pillars, in addition to State laws and programs, by 2035. As shown therein, implementation of State laws and programs as well as these pillars would reduce communitywide emissions by approximately 286,680 MT of CO₂e per year, or approximately 66 percent, below 1990 levels to approximately 111,030 MT of CO₂e per year. These emission reductions would equate to a approximately 72 percent reduction below business-as-usual GHG emissions forecast for year 2035.

⁶ San Luis Obispo, City of. 2019. *Carbon Neutrality Vision and Three-Year Strategic Plan Technical Report*. November 2019.

⁷ Ibid.

Table 2 City of San Luis Obispo Communitywide GHG Emissions Reductions by 2035

Source	Annual Emissions (MT of CO ₂ e)
1990 Baseline Emissions ¹	328,630
Business-as-Usual 2035 Emissions ²	397,710
State Laws/Programs ³	(102,410)
Pillar 2: Clean Energy Systems	(39,010)
Pillar 3: Green Buildings	(26,740)
Pillar 4: Connected Community	(64,170)
Pillar 5: Circular Economy	(47,300)
Pillar 6: Natural Solutions	(7,050)
Total Emissions Reductions	(286,680)
Remaining 2035 Emissions	111,030
Percent Reduction below 1990 Levels	(66%)
Percent Reduction below Business-as-Usual 2035 Levels	(72%)

MT = metric tons; CO₂e = carbon dioxide equivalents; () denotes a negative number

Notes: GHG emissions reductions achieved by Pillar 1: Lead by Example are not included because implementation of the foundational actions associated with this pillar would serve only to reduce municipal, rather than communitywide, emissions. Numbers are rounded to the nearest ten.

¹ See Table 2.

² See Table 3.

³ Includes implementation of State vehicle fuel efficiency standards and triennial updates of Title 24. The Renewable Portfolio Standards program is not included because Pillar 2 already accounts for 100 percent carbon-free electricity by 2020.

Sources: San Luis Obispo, City of. 2019. *Community Greenhouse Gas Emissions Inventory and Forecast*.

San Luis Obispo, City of. 2019. *Carbon Neutrality Vision and Three-Year Strategic Plan Technical Report*. November 2019.

2.3 GHG Emissions Forecast

Figure 2 and Table 3 summarize the communitywide GHG emissions forecast under three scenarios: 1) business-as-usual, 2) implementation of State laws and programs, and 3) implementation of State laws and programs and the CAP. As shown therein, under the business-as-usual scenario, communitywide GHG emissions are forecasted to increase by approximately 21 percent between 1990 and 2035 based on economic and population growth. However, with implementation of State laws and programs, communitywide GHG emissions would decline by approximately 22 percent between 1990 and 2035. Furthermore, full implementation of the CAP alongside State laws and programs would reduce communitywide GHG emissions by approximately 66 percent below 1990 levels by 2035.

Figure 2 City of San Luis Obispo GHG Emissions Forecast, 2005 to 2035

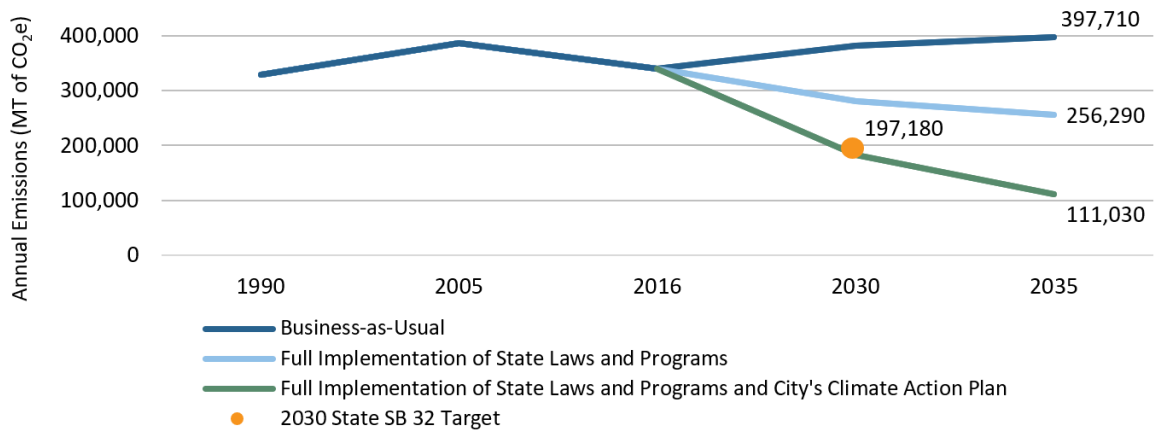


Table 3 City of San Luis Obispo GHG Emissions Forecast Through 2035

Sector	1990 (MT of CO ₂ e)	2005 (MT of CO ₂ e)	2016 (MT of CO ₂ e)	2030 (MT of CO ₂ e)	2035 (MT of CO ₂ e)	Percent Change (1990-2035)
Business-as-Usual						
Transportation	191,580	225,390	212,980	234,570	242,280	26%
Non-residential Energy	49,340	58,050	44,270	51,860	54,880	11%
Residential Energy	47,130	55,450	39,410	45,660	47,990	2%
Solid Waste	40,580	47,740	42,630	49,880	52,560	30%
Total	328,630	386,630	339,290	381,970	397,710	21%
Implementation of State Laws and Programs¹						
Transportation	191,580	225,390	212,980	161,290	142,830	(25%)
Non-residential Energy	49,340	58,050	44,270	33,690	27,720	(44%)
Residential Energy	47,130	55,450	39,410	35,660	33,180	(30%)
Solid Waste	40,580	47,740	42,630	49,880	52,560	30%
Total	328,630	386,630	339,290	280,520	256,290	(22%)
Implementation of State Laws and Programs and City's Climate Action Plan						
Transportation ²	191,580	225,390	212,980	116,050	78,660	(59%)
Non-residential Energy ³	49,340	58,050	44,270	29,710	21,000	(57%)
Residential Energy ³	47,130	55,450	39,410	27,680	13,160	(72%)
Solid Waste ⁴	40,580	47,740	42,630	12,470	5,260	(87%)
Carbon Sequestration ⁵	0	0	0	(3,610)	(7,050)	n/a
Total	328,630	386,630	339,290	182,300	111,030	(66%)

MT = metric tons; CO₂e = carbon dioxide equivalents; () denotes a negative number

Note: Numbers are rounded to the nearest ten.

¹ State laws and programs include State vehicle fuel efficiency standards, the Renewable Portfolio Standard, and triennial updates of Title 24.

² Includes implementation of Pillar 4: Connected Community.

³ Includes implementation of Pillar 2: Clean Energy Systems and Pillar 3: Green Buildings.

⁴ Includes implementation of Pillar 5: Circular Economy.

⁵ Includes implementation of Pillar 6: Natural Solutions.

Sources: Appendix C; San Luis Obispo, City of. 2019. Community Greenhouse Gas Emissions Inventory and Forecast.

At this time, the State has codified a target of reducing emissions to 40 percent below 1990 emissions levels by 2030 (Senate Bill [SB] 32) and has developed the 2017 Climate Change Scoping Plan to demonstrate how the State will achieve the 2030 target and make substantial progress toward the 2050 goal of an 80 percent reduction in 1990 GHG emission levels set by Executive Order

(EO) S-3-05. The recently signed EO B-55-18 identifies a new goal of carbon neutrality by 2045 and supersedes the goal established by EO S-3-05.

While State and regional regulations related to energy and transportation systems, along with the State’s Cap and Trade program, are designed to be set at limits to achieve most of the GHG emissions reductions needed to achieve the State’s long-term targets, local governments can do their fair share toward meeting the State’s targets by siting and approving projects that accommodate planned population growth and projects that are GHG-efficient. The Association of Environmental Professional (AEP) Climate Change Committee recommends that CEQA GHG analyses evaluate project emissions in light of the trajectory of State climate change legislation and assess their “substantial progress” toward achieving long-term reduction targets identified in available plans, legislation, or EOs.

The City has adopted a long-term aspirational goal of achieving carbon neutrality by 2035 and has proposed the CAP as a pathway to make progress toward this goal. As shown in Table 3, implementation of the CAP would achieve an approximately 45 percent reduction in communitywide GHG emissions below 1990 levels by 2030⁸ and an approximately 66 percent reduction in communitywide GHG emissions below 1990 levels by 2035. Therefore, the City’s long-term aspirational goal of carbon neutrality and the associated CAP establish a trajectory that provides GHG emissions reductions greater than those required by SB 32 for 2030. Because SB 32 is considered an interim target toward meeting the 2045 State goal of carbon neutrality, implementation of the CAP would make substantial progress toward meeting the State’s long-term 2045 goal. Avoiding interference with, and making substantial progress toward, these long-term State targets is important because these targets have been set at levels that achieve California’s fair share of international emissions reduction targets that will stabilize global climate change effects and avoid the adverse environmental consequences described in Appendix A (Executive Order B-55-18).

2.4 Qualified GHG Emissions Reduction Plan

According to CEQA Guidelines Section 15183.5, project-specific environmental documents can tier from, or incorporate by reference, the existing programmatic review in a qualified GHG emissions reduction plan, which allows for project-level evaluation of GHG emissions through the comparison of the project’s consistency with the GHG emissions reduction strategy included in the qualified GHG emissions reduction plan. To meet the requirements of CEQA Guidelines Section 15183.5, a qualified GHG emissions reduction plan must include the following:

1. Quantify existing and projected GHG emissions within the plan area;
2. Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
3. Identify and analyze sector specific GHG emissions within the plan’s geographic area;
4. Specify measures or a group of measures, including performance standards, that if implemented, would collectively achieve the specified emissions level;
5. Establish a tool or mechanism to monitor progress and to require amendment if the plan is not achieving specified levels; and
6. Be adopted in a public process following environmental review.

⁸ $(328,630 \text{ MT of CO}_2\text{e} - 182,300 \text{ MT of CO}_2\text{e}) / 328,630 \text{ MT of CO}_2\text{e} = 45\% \text{ reduction}$

Development projects can demonstrate consistency with a qualified GHG emissions reduction plan if they are consistent with the plan's assumptions regarding future growth projections and consistent with the plan's GHG emissions reduction measures.⁹ Projects consistent with the qualified GHG reduction plan, including conformance with performance measures applicable to the project, would not require additional GHG emissions analysis or mitigation under CEQA Guidelines Sections 15064(h) and 1513.5(b)(2). The City of San Luis Obispo has developed the CEQA GHG Emissions Analysis Compliance Checklist to assist with determining project consistency with the CAP. The checklist is intended to provide individual projects the opportunity to demonstrate that they are minimizing GHG emissions while ensuring that new development achieves its proportion of emissions reductions consistent with the assumptions of the CAP. Project consistency with a GHG emissions reduction plan can also be demonstrated through quantitative analysis that demonstrates the project will not impede (or will facilitate) the City's ability to meet its GHG emissions reduction targets or by incorporating the reduction measures included in the GHG emissions reduction plan.

Table 4 summarizes the consistency of the CAP with these requirements for year 2030 (the next State milestone target year for GHG emission reductions). As shown in Table 4, upon adoption of the IS-ND and approval of the plan by City Council, the City's CAP will meet the requirements of a qualified GHG emission reduction plan per CEQA Guidelines Section 15183.5(1) for projects with buildout years through 2030.

⁹ CAPs typically utilize growth projections from the local jurisdiction's General Plan or applicable Metropolitan Planning Organization's regional demographic forecast.

Table 4 CAP Consistency with CEQA Guidelines Section 15183.5(1) for Year 2030

CEQA Guidelines Section 15183.5(1) Requirement ¹	Climate Action Plan Consistency
Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area.	Consistent. The CAP includes communitywide GHG emissions inventories for years 2005 and 2016 and forecasts GHG emissions for years 2020, 2030, and 2035.
Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable.	Consistent. A key aspect of a qualified GHG emissions reduction plan is substantial evidence that the identified GHG emissions reduction target establishes a threshold where GHG emissions are not cumulatively considerable. The Association of Environmental Professionals (2016) Beyond Newhall and 2020 white paper identifies this threshold as being a local target that aligns with the State legislative targets. The CAP establishes a long-term aspirational goal of carbon neutrality by 2035, and as discussed in Section 2.3, <i>GHG Emissions Forecast</i> , implementation of the plan will achieve a 45 percent reduction in 1990 emissions levels by 2030. Therefore, this local target is more stringent than the State targets of a 40 percent emission reduction in 1990 levels by 2030.
Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area.	Consistent. The CAP breaks down its inventories into four sectors (transportation, residential energy, non-residential energy, and solid waste). The plan also identifies six pillars of GHG emission reductions and quantifies the emission reductions that would be achieved by implementation of each pillar.
Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.	Consistent. The CAP specifies pillars, measures, and foundational actions that the City will enact and implement between 2020 and 2035 to further its long-term aspirational goal of carbon neutrality. As discussed in Section 2.3, <i>GHG Emissions Forecast</i> , implementation of the plan will achieve a 45 percent reduction in 1990 emissions levels by 2030, which is more stringent than the State target of a 40 percent emission reduction in 1990 levels by 2030 and demonstrates substantial progress by 2030 toward achieving the City’s long-term aspirational goal of carbon neutrality by 2035.
Establish a mechanism to monitor the plan’s progress toward achieving the level and to require amendment if the plan is not achieving specified levels.	Consistent. The CAP includes a process to update and adopt a new CAP every other financial plan cycle in order to incorporate new measures and technologies that will further the City toward meeting its long-term aspirational goal of carbon neutrality.
Be adopted in a public process following environmental review.	Consistent. The City has prepared an IS-ND for the CAP that will be circulated for public review and comment and adopted prior to approval of the CAP and CEQA GHG Emissions Thresholds and Guidance by City Council.

¹ Source: 2019 CEQA Guidelines

3 Regulatory and Legal Setting

The following regulations, executive orders, and case law pertain to the analysis of GHG emissions consistent with CEQA and the CEQA Guidelines.

3.1 Relevant CEQA Guidelines Sections

Pursuant to the requirements of SB 97, the California Natural Resources Agency has adopted amendments to the CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted CEQA Guidelines, which were last updated in December 2018, provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG emissions and climate change impacts.

Based on Appendix G of the CEQA Guidelines, impacts related to GHG emissions generated by a proposed plan/project would be significant if the plan/project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; and/or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

The vast majority of individual projects do not generate sufficient GHG emissions to directly influence climate change. However, physical changes caused by a plan/project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a plan/project are limited. As discussed in Appendix A, the adverse environmental impacts of cumulative GHG emissions, including sea level rise, increased average temperatures, more drought years, and more large forest fires, are already occurring. As a result, cumulative impacts related to GHG emissions and climate change are significant. Therefore, per CEQA Guidelines Section 15064.4(b), the analysis of GHG emissions under CEQA typically involves an analysis of whether a plan or project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines Section 15064[h][1]).

The following sections of the CEQA Guidelines (last updated on December 28, 2018) pertain to the creation of significance thresholds and the analysis of a plan/project's GHG emissions.

CEQA Guidelines Section 15064(b)

- (1) The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area.
- (2) Thresholds of significance, as defined in Section 15064.7(a), may assist lead agencies in determining whether a project may cause a significant impact. When using a threshold, the

lead agency should briefly explain how compliance with the threshold means that the project's impacts are less than significant. Compliance with the threshold does not relieve a lead agency of the obligation to consider substantial evidence indicating that the project's environmental effects may still be significant.¹⁰

CEQA Guidelines Section 15064.4

- (a) The determination of the significance of GHG emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to
 - (1) Quantify GHG emissions resulting from a project; and/or
 - (2) Rely on a qualitative analysis or performance-based standards.
- (b) In determining the significance of a project's GHG emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to Statewide, national or global emissions. The agency's analysis should consider a timeframe that is appropriate for the project. The agency's analysis also must reasonably reflect evolving scientific knowledge and State regulatory schemes. A lead agency should consider the following factors, among others, when determining the significance of impacts from GHG emissions on the environment:
 - (1) The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting.
 - (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
 - (3) The extent to which the project complies with regulations or requirements adopted to implement a Statewide, regional, or local plan for the reduction or mitigation of GHG emissions (see, e.g., section 15183.5[b]). Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project. In determining the significance of impacts, the lead agency may consider a project's consistency with the State's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and its conclusion that the project's incremental contribution is not cumulatively considerable.
- (c) A lead agency may use a model or methodology to estimate GHG emissions resulting from a project. The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change. The lead agency must support its selection of a

¹⁰ 2019 CEQA Guidelines.

model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use.¹¹

CEQA Guidelines Section 15064.7

- (a) A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.
- (b) Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects. Thresholds of significance to be adopted for general use as part of the lead agency’s environmental review process must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence. Lead agencies may also use thresholds on a case-by-case basis as provided in Section 15064(b)(2).
- (c) When adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.
- (d) Using environmental standards as thresholds of significance promotes consistency in significance determinations and integrates environmental review with other environmental program planning and regulation. Any public agency may adopt or use an environmental standard as a threshold of significance. In adopting or using an environmental standard as a threshold of significance, a public agency shall explain how the particular requirements of that environmental standard reduce project impacts, including cumulative impacts, to a level that is less than significant, and why the environmental standard is relevant to the analysis of the project under consideration. For the purposes of this subdivision, an “environmental standard” is a rule of general application that is adopted by a public agency through a public review process and that is all the following:
 - (1) a quantitative, qualitative or performance requirement found in an ordinance, resolution, rule, regulation, order, plan or other environmental requirement;
 - (2) adopted for the purpose of environmental protection;
 - (3) addresses the environmental effect caused by the project; and,
 - (4) applies to the project under review.¹²

CEQA Guidelines Section 15183.5

- (a) Lead agencies may analyze and mitigate the significant effects of GHG emissions at a programmatic level, such as in a general plan, a long-range development plan, or a separate plan to reduce GHG emissions. Later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review. Project-specific environmental documents may rely on an EIR containing a programmatic analysis of GHG emissions as provided in section 15152 (tiering), 15167 (staged EIRs) 15168 (program EIRs),

¹¹ *Ibid.*

¹² *Ibid.*

CEQA GHG Emissions Thresholds and Guidance

15175–15179.5 (Master EIRs), 15182 (EIRs Prepared for Specific Plans), and 15183 (EIRs Prepared for General Plans, Community Plans, or Zoning).

- (b) Plans for the Reduction of GHG Emissions. Public agencies may choose to analyze and mitigate significant GHG emissions in a plan for the reduction of GHG emissions or similar document. A plan to reduce GHG emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project’s incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.
 - (1) Plan Elements. A plan for the reduction of GHG emissions should:
 - (A) Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
 - (B) Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
 - (C) Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;
 - (D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
 - (E) Establish a mechanism to monitor the plan’s progress toward achieving the level and to require amendment if the plan is not achieving specified levels;
 - (F) Be adopted in a public process following environmental review.
 - (2) Use with Later Activities. A plan for the reduction of GHG emissions, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis of later projects. An environmental document that relies on a GHG reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. If there is substantial evidence that the effects of a particular project may be cumulatively considerable, notwithstanding the project’s compliance with the specified requirements in the plan for the reduction of GHG emissions, an EIR must be prepared for the project.
- (c) Special Situations. As provided in Public Resources Code sections 21155.2 and 21159.28, environmental documents for certain residential and mixed use projects, and transit priority projects, as defined in section 21155, that are consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in an applicable sustainable communities strategy or alternative planning strategy need not analyze global warming impacts resulting from cars and light duty trucks. A lead agency should consider whether such projects may result in GHG emissions resulting from other sources, however, consistent with these Guidelines.¹³

¹³ Ibid.

CEQA Guidelines Section 15126.4(c)

Consistent with section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of GHG emissions. Measures to mitigate the significant effects of GHG emissions may include, among others:

- (1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;
- (2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures, such as those described in Appendix F;
- (3) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;
- (4) Measures that sequester GHGs;
- (5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of GHG emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.¹⁴

3.2 Relevant State and Regional GHG Reduction Targets

Executive Order S-03-05

On June 1, 2005, the governor issued EO S-03-05, which established a statewide goal of reducing GHG emissions to 1990 levels by 2020 and created the Climate Action Team. The 2020 GHG reduction target contained in EO S-03-05 was later codified by Assembly Bill (AB) 32.

Assembly Bill 32

California's major initiative for reducing GHG emissions is outlined in AB 32, the "California Global Warming Solutions Act of 2006," which was signed into law in 2006. AB 32 codifies the Statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires the California Air Resources Board (CARB) to prepare a Scoping Plan that outlines the main State strategies for reducing GHG emissions to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of Statewide GHG emissions. Based on this guidance, CARB approved a 1990 Statewide GHG level and 2020 limit of 427 million metric tons (MMT) of carbon dioxide equivalents (CO₂e).¹⁵ The Scoping Plan was approved by CARB on December 11, 2008 and included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures

¹⁴ Ibid.

¹⁵ Different types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas, CO₂, is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as carbon dioxide equivalent (CO₂e), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane has a GWP of 25, meaning its global warming effect is 25 times greater than CO₂ on a molecule per molecule basis (Intergovernmental Panel on Climate Change 2007).

included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since approval of the Scoping Plan.¹⁶

In May 2014, CARB approved the first update to the AB 32 Scoping Plan. The 2013 Scoping Plan update defined CARB's climate change priorities for the next five years and set the groundwork to reach post-2020 Statewide goals. The update highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the State's longer-term GHG reduction strategies with other State policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use.¹⁷

Executive Order B-30-15

On April 29, 2015, the governor issued EO B-30-15, which established state GHG emission reduction targets of 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050. The 2030 GHG emissions reduction target contained in EO B-30-15 was later codified by SB 32.

Senate Bill 32

On September 8, 2016, the governor signed SB 32 into law, extending AB 32 by requiring the State to further reduce GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently adopted programs and policies, such as SB 350 and SB 1383. The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with Statewide per capita goals of six metric tons (MT) of CO₂e by 2030 and two MT of CO₂e by 2050. As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, subregional, or regional level), but not for specific individual projects because they include all emissions sectors in the State.¹⁸

Senate Bill 375

SB 375, signed in August 2008, enhances the state's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. SB 375 aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPOs) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPO's Regional Transportation Plan (RTP). Qualified projects consistent with an approved SCS or Alternative Planning Strategy categorized as "transit priority projects" would receive incentives to streamline CEQA processing

¹⁶ CARB. 2008. *Climate Change Scoping Plan*. December 2008.

https://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf (accessed January 2020).

¹⁷ CARB. 2014. *First Update to the Climate Change Scoping Plan*. May 15, 2014.

https://www3.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf (accessed January 2020).

¹⁸ CARB. 2017. 2017 Climate Change Scoping Plan. https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf (accessed January 2020).

On March 22, 2018, CARB adopted updated regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. The San Luis Obispo Council of Governments (SLOCOG) was assigned targets of a 3 percent reduction in GHGs from transportation sources by 2020 and an 11 percent reduction in GHGs from transportation sources by 2035. SLOCOG adopted the 2019 RTP in June 2019, which includes the region’s SCS and meets the requirements of SB 375.¹⁹

Executive Order B-55-18

On September 10, 2018, the governor issued EO B-55-18, which established a new Statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing Statewide GHG emission reduction targets established by SB 375, SB 32, SB 1383, and SB 100. EO B-55-18 also tasks CARB with including a pathway toward the EO B-55-18 carbon neutrality goal in the next Scoping Plan update.

3.3 Relevant GHG Emissions Analysis Case Law

Friends of Oroville v. City of Oroville (Case No. 070448)

The Third District Court of Appeal decision in the *Friends of Oroville v. City of Oroville* case was published on August 19, 2013. This decision evaluated the methodology used to analyze GHG emissions in an Environmental Impact Report (EIR) prepared for a Wal-Mart Supercenter development project that included replacing an existing Wal-Mart store with a Wal-Mart Supercenter in Oroville in Butte County. The EIR used consistency with the AB 32 emissions reduction target as its significance threshold for evaluating the project’s GHG emissions and compared the magnitude of the proposed project’s emissions to statewide 2004 emission levels as part of the analysis. The Court found that EIR applied “a meaningless, relative number to determine insignificant impact” rather than evaluating the project’s emissions in light of the AB 32 emissions reduction target. The Court also found that the EIR “misapplied the [AB] 32 threshold-of-significance standard by [1] failing to calculate the GHG emissions for the existing Wal-Mart and [2] failing to quantitatively or qualitatively ascertain or estimate the effect of the Project’s mitigation measures on GHG emissions.” The Court determined that the EIR could and should have performed these quantifications to adequately evaluate the project’s GHG emissions using the AB 32 emissions reduction target.

Sierra Club v. County of San Diego (Case No. 37-2018-00043084-CU-TT-CTL)

The Fourth District Court of Appeal decision in the *Sierra Club v. County of San Diego* case was published on October 29, 2014. This decision evaluated the adequacy of the CAP prepared by the County of San Diego to satisfy Mitigation Measure CC-1.2 of the program EIR prepared for its 2011 General Plan. To reduce GHG emissions impacts of the 2011 General Plan to a less-than-significant level, Mitigation Measure CC-1.2 required the preparation of a CAP that would include “more detailed GHG emissions reduction targets and deadlines” and that would “achieve comprehensive and enforceable GHG emissions reduction of 17 percent (totaling 23,572 MT of CO₂e) from County operations from 2006 by 2020 and 9 percent reduction (totaling 479,717 MT of CO₂e) in community emissions from 2006 by 2020.” The Court found the CAP did not include enforceable and feasible GHG emission reduction measures that would achieve the necessary emissions reductions; therefore, the CAP did not meet the requirements of Mitigation Measure CC-1.2 and would not

¹⁹ San Luis Obispo Council of Governments. 2019. 2019 Regional Transportation Plan: Connecting Communities. <https://slocog.org/2019RTP> (accessed January 2020).

ensure that the mitigation measure would reduce GHG emissions to a less-than-significant impact. In addition, the Court found that the County failed to evaluate the environmental impacts of the CAP and its associated thresholds of significance under CEQA.

Center for Biological Diversity v. California Department of Fish and Wildlife (Case No. 217763)

The California Supreme Court's decision in the *Center for Biological Diversity v. California Department of Fish and Wildlife* case was published on November 30, 2015. This decision evaluated the methodology used to analyze GHG emissions in an EIR prepared for the Newhall Ranch development project that included approximately 20,885 dwelling units with 58,000 residents on 12,000 acres of undeveloped land in Los Angeles County. The EIR used a business-as-usual (BAU) approach to evaluate whether the project would be consistent with the AB 32 Scoping Plan. The Court found there was insufficient evidence in the record of that project to explain how a project that reduces its GHG emissions by the same percentage as the BAU reduction identified for the State to meet its Statewide targets supported a conclusion that project-level impacts were below the level of significance.

The California Supreme Court suggested regulatory consistency as a pathway to compliance by stating that a lead agency might assess consistency with the State's GHG reduction goals by evaluating for compliance with regulations designed to reduce GHG emissions. This approach is consistent with CEQA Guidelines Section 15064.4(b), which provides that a determination of an impact is not cumulatively considerable to the extent to which the project complies with regulations or requirements implementing a Statewide, regional, or local plan to reduce or mitigate GHG emissions. The Court also found that a lead agency may rely on numerical and efficiency-based thresholds of significance for GHG emissions, if supported by substantial evidence.

Golden Door Properties, LLC v. County of San Diego/Sierra Club, LLC v. County of San Diego (Case No. 072406)

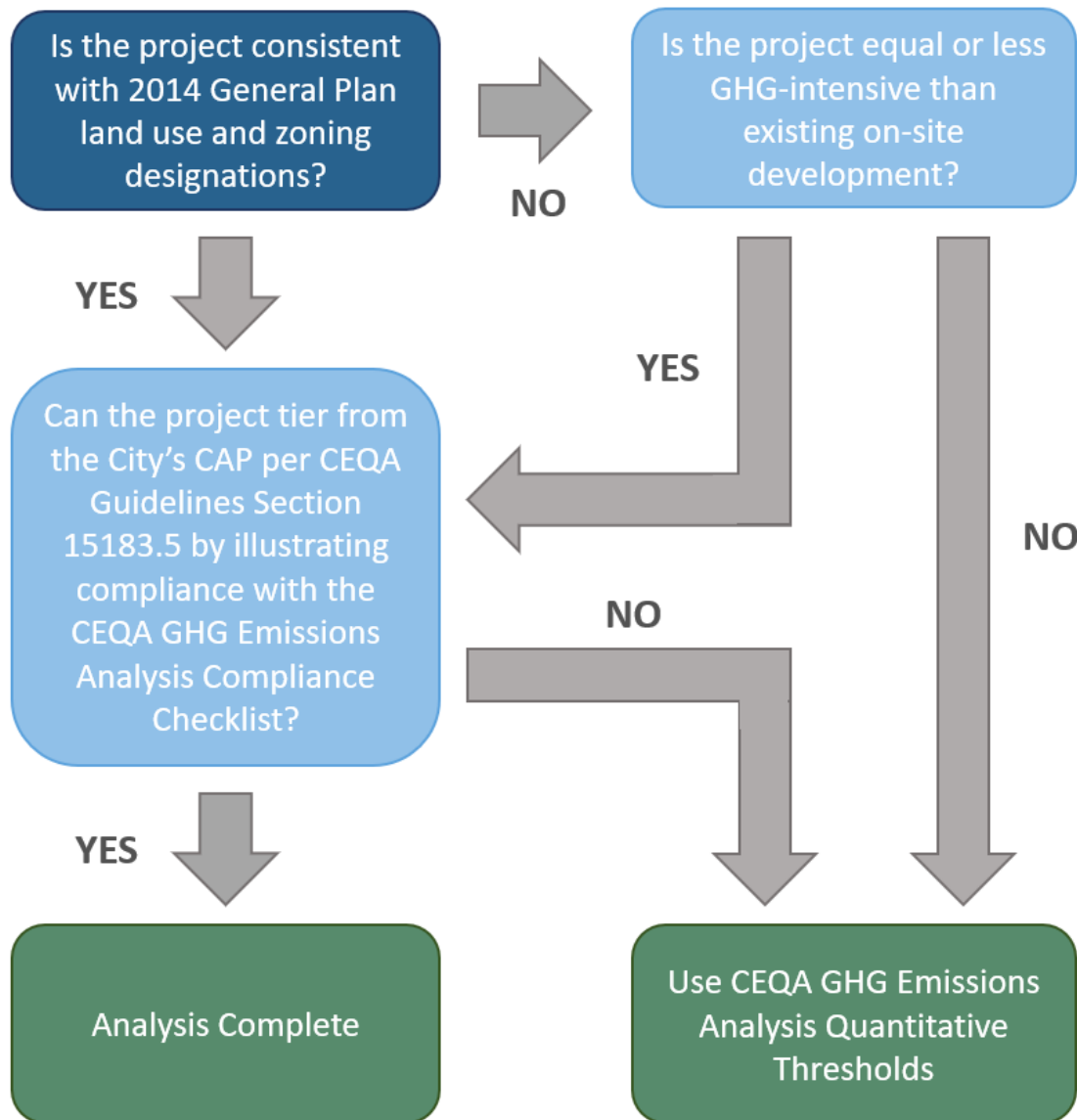
The Fourth District Court of Appeal decision in the *Golden Door Properties, LLC v. County of San Diego* case (published on September 28, 2018) evaluated the County of San Diego's 2016 Guidance Document's GHG efficiency metric, which establishes a generally applicable threshold of significance for proposed projects. The Court held that the County of San Diego is barred from using its 2016 Guidance Document's threshold of significance of 4.9 MT of CO₂e per service person per year for GHG analysis. The Court stated that the document violated CEQA because it was not adopted formally by ordinance, rule, resolution, or regulation through a public review process per CEQA Guidelines Section 15064.7(b). The Court also found that the threshold was not supported by substantial evidence that adequately explained how a service population threshold derived from Statewide data could constitute an appropriate GHG metric to be used for all projects in unincorporated San Diego County. Nevertheless, lead agencies may make plan- or project-specific GHG emissions threshold determinations.

4 Determining Consistency with the City's Climate Action Plan

As discussed in Chapter 2, *Climate Action Plan Summary*, upon public adoption of the CAP IS-ND and approval of the CAP by City Council, the City's CAP will be a qualified GHG emission reduction plan per the requirements of CEQA Guidelines Section 15183.5 for year 2030 and can, therefore, be utilized to streamline the GHG emissions analysis for plans and projects with buildout years through 2030.²⁰ Projects that are consistent with the demographic forecasts and land use assumptions used in the CAP can utilize the City's CEQA GHG Emissions Analysis Compliance Checklist to demonstrate consistency with the CAP's GHG emissions reduction strategy, and if consistent, can tier from the existing programmatic environmental review contained in the adopted IS-ND for the CAP. In doing so, these projects would result in less-than-significant GHG emissions and would not result in a cumulatively considerable impact related to GHG emissions and climate change. The following process, illustrated in Figure 3, explains how to demonstrate a plan/project's consistency with the CAP's GHG emissions reduction strategy and, thereby, tier from the adopted IS-ND for the CAP. This approach is consistent with the recommendations of the AEP Climate Change Committee (2016) for tiering from qualified GHG reduction plans that demonstrate substantial progress toward meeting the next milestone Statewide planning reduction target (i.e., a 40 percent reduction below 1990 levels by 2030 as set forth by SB 32).

²⁰ Projects that are statutorily or categorically exempt from CEQA compliance would not need to perform an analysis of GHG emissions or tier from the City's CAP.

Figure 3 Determining Consistency with the City’s Climate Action Plan



Step 1: Consistency with the Demographic Forecasts and Land Use Assumptions

The demographic forecasts and land use assumptions of the CAP are based on the Land Use and Circulation Elements of the City’s 2014 General Plan.²¹ If a plan/project is consistent with the existing (2014) General Plan land use and zoning designation(s) of the plan area/project site as identified in the City’s General Plan Land Use and Circulation Elements adopted in 2014, then the plan/project is consistent with the demographic forecasts and land use assumptions of the CAP and can move on to Step 2. In this case, the plan/project’s associated GHG emissions were accounted for

²¹ San Luis Obispo, City of. 2014. City of San Luis Obispo General Plan. Adopted December 9, 2014. <https://www.slocity.org/government/department-directory/community-development/planning-zoning/general-plan> (accessed January 2020).

in the GHG emissions forecasts included in the CAP and are within the scope of this plan's analysis of communitywide GHG emissions. Accordingly, the analysis of the plan/project's GHG emissions in its CEQA document should include a reference to the plan/project's consistency with the existing (2014) General Plan land use and zoning designation(s) of the plan area/project site and should explain the aforementioned connection between the existing (2014) General Plan land use and zoning designation(s) and the GHG emissions forecasts in the CAP. Then, proceed to Step 2.

If a plan/project is not consistent with the existing (2014) General Plan land use and zoning designation(s) of the plan area/project site but would result in equivalent or fewer GHG emissions as compared to existing on-site development, then the plan/project would still be within the demographic forecasts and land use assumptions of the CAP and can move on to Step 2. To provide substantial evidence for this determination, GHG emissions generated under existing conditions and the proposed project need to be quantified and included in the CEQA analysis. See Chapter 6, *Quantifying GHG Emissions*, for guidance on quantifying GHG emissions for existing conditions and the proposed plan/project. In this case, the analysis of the plan/project's GHG emissions in its CEQA document should include a quantitative comparison of the proposed plan/project's GHG emissions and GHG emissions generated by existing on-site development. The analysis should clearly explain how the plan/project's emissions are equivalent or less than those generated by existing on-site development. Then, proceed to Step 2.

If a plan/project is not consistent with the existing (2014) General Plan land use and zoning designation(s) of the plan area/project site and would result in either new development of undeveloped land or redevelopment with higher GHG emissions than existing on-site development, the plan/project cannot use the CEQA GHG Emissions Analysis Compliance Checklist to tier from the adopted IS-ND for the CAP. Instead, the plan/project's GHG emissions can be evaluated using the quantitative GHG thresholds described in Chapter 5, *Utilizing Quantitative CEQA GHG Thresholds*, to evaluate the significance of the plan/project's GHG emissions. This method can also be utilized for projects with a post-2030 buildout year.

Step 2: Consistency with CEQA GHG Emissions Analysis Compliance Checklist

The City has prepared the CEQA GHG Emissions Analysis Compliance Checklist for plans and projects to ensure that they are consistent with the measures of the CAP (Appendix B). A project applicant can utilize the checklist to show that the plan/project includes all applicable measures of the CAP. Projects that use the CEQA GHG Emissions Analysis Compliance Checklist are not required to quantify reductions from the measures included on the checklist because the reductions from applicable measures have already been quantified at a programmatic level in the CAP. If a plan/project is consistent with the applicable measures on the CEQA GHG Emissions Analysis Compliance Checklist, then the plan/project can tier from the programmatic environmental review included in the adopted IS-ND for the CAP pursuant to CEQA Guidelines Section 15183.5(b). A plan/project that is consistent with all applicable measures of the CEQA GHG Emissions Analysis Compliance Checklist would result in less-than-significant GHG emissions and would not result in a cumulatively considerable impact related to GHG emissions and climate change. In this case, the analysis of a plan or project's GHG emissions in its respective CEQA review document should include a summary of the plan/project's consistency with applicable measures of the CEQA GHG Emissions Analysis Compliance Checklist and an explanation with substantial evidence of why any measures in the checklist are not applicable to the plan/project.

5 Utilizing Quantitative CEQA GHG Thresholds

As discussed in Chapter 4, *Determining Consistency with the City's C*, if a plan/project is not consistent with the existing (2014) General Plan land use and zoning designation(s) of the plan area/project site or has a post-2030 buildout year, then the plan/project cannot use the CEQA GHG Emissions Analysis Compliance Checklist to tier from the adopted IS-ND for the CAP. Instead, the significance of the plan/project's GHG emissions can be evaluated using quantitative GHG thresholds derived from the assumptions of the CAP. If the plan/project's emissions are at or below the applicable threshold, the plan/project can tier from the existing programmatic environmental review contained in the adopted IS-ND for the CAP if it has a pre-2030 buildout year. In doing so, these plans/projects would result in less-than-significant GHG emissions and would not result in a cumulatively considerable impact related to GHG emissions and climate change. For plans/projects with post-2030 buildout years, emissions at or below the thresholds for 2035, which equate to 0 MT of CO₂e per year, would be considered less-than-significant, and these plans/projects would not result in a cumulatively considerable impact related to GHG emissions. The following sections provide an explanation of the methodology used to calculate the thresholds, guidance on how to utilize the thresholds, and justification for use of these thresholds.

5.1 GHG Emissions Calculation Methodology

CEQA Guidelines Section 15064.4 does not establish a specific quantitative threshold of significance for evaluating GHG emissions associated with a proposed plan or project. Lead agencies have the discretion to establish significance thresholds for their respective jurisdictions, and in establishing those thresholds, a lead agency may appropriately look to thresholds developed by other public agencies, or suggested by other experts, as long as the threshold chosen is supported by substantial evidence (CEQA Guidelines Section 15064.7[c]). The following methodology is consistent with guidance provided by the AEP Climate Change Committee in 2016 for establishing GHG emissions efficiency thresholds using the local jurisdictional GHG inventory and demographic forecasts.²²

An efficiency threshold is a threshold expressed as a per-person metric (e.g., per resident, per employee, or per service person). Efficiency thresholds are calculated by dividing the allowable GHG emissions inventory in a selected calendar year by the resident, employee, or service population in that year.²³ The efficiency threshold identifies the quantity of GHG emissions that can be generated on a per-person basis without significantly impacting the environment.

Locally appropriate, plan- and project-specific GHG emissions efficiency thresholds were derived from the GHG emissions forecasts calculated for the CAP. These thresholds were created to comply with CEQA and the CEQA Guidelines and interpretive GHG emissions analysis case law, which are summarized in Chapter 3, *Regulatory and Legal Setting*. The City of San Luis Obispo GHG emissions efficiency thresholds were calculated using the emissions forecasts with all emissions sectors included, because plans and projects would generate vehicle trips, consume energy, and produce

²² AEP. 2016. Final White Paper Beyond 2020 and Newhall: A Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California. https://califaep.org/docs/AEP-2016_Final_White_Paper.pdf (accessed January 2020).

²³ Per the method used by the San Luis Obispo Community Development Department, the service population is equal to the residential population plus half the number of jobs.

solid waste, thereby generating emissions in all categories. Efficiency thresholds were calculated for year 2030 to provide GHG emissions thresholds for new development in line with the State’s next milestone target for year 2030.

GHG emissions efficiency thresholds would be used during the CEQA review process for new residential, non-residential, and mixed-use plans and projects. Therefore, forecasted GHG emissions in the CAP were disaggregated into existing development and new development for each threshold year. Furthermore, forecasted GHG emissions for new development were further disaggregated into residential and non-residential development for each threshold year for the purpose of calculating thresholds specific to residential, non-residential, and mixed-use projects. The results of the disaggregation of the GHG emissions forecast are presented in Figure 4 and Table 5, which summarizes the total amount of GHG emissions expected to be generated by existing, new residential, and new non-residential development for threshold year 2030.

Figure 4 Allowable GHG Emissions from Existing and New Development in Year 2030

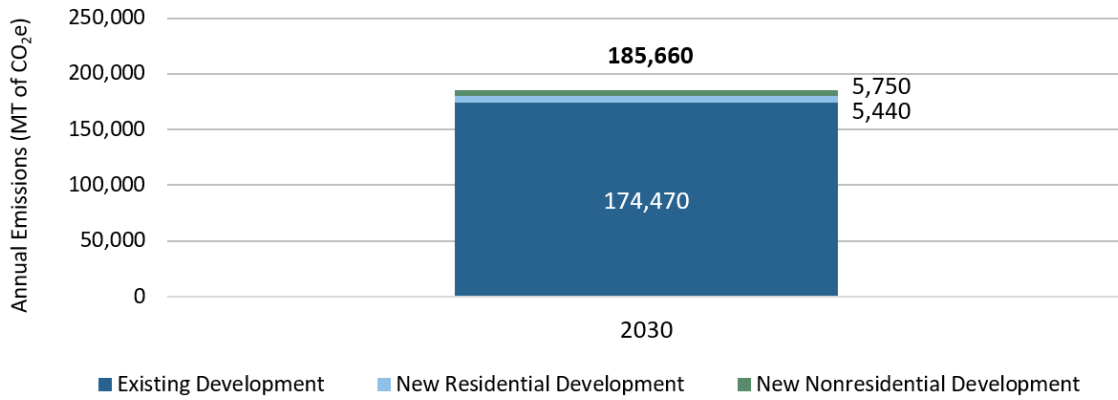


Table 5 GHG Emissions Forecast for Year 2030 by Type of Development (MT of CO₂e)

Source	2030		
	Existing Development	New Development	
		Residential	Non-Residential
Baseline GHG Emissions	339,290	24,750	17,930
State Laws/Programs	(62,620)	(8,560)	(4,220)
CAP Pillar 2: Clean Energy Systems	(23,170)	n/a	(2,880)
CAP Pillar 3: Green Buildings	(8,180)	(3,020)	(760)
CAP Pillar 4: Connected Community	(38,660)	(4,220)	(2,360)
CAP Pillar 5: Circular Economy	(31,970)	(3,490)	(1,950)
CAP Pillar 6: Natural Solutions ¹	(220)	(20)	(10)
Remaining Total GHG Emissions	174,470	5,440	5,750

() denotes a negative number; n/a = not applicable

Note: GHG emissions reductions achieved by Pillar 1: Lead by Example are not included because implementation of the foundational actions associated with this pillar would serve only to reduce municipal, rather than communitywide, emissions.

¹ Only includes reductions from Natural Solutions Measure 2 (Tree Planting) because implementation of Natural Solutions Measure 1 (Carbon Farming) is not the responsibility of existing and new development.

See Appendix C for calculations.

Table 6 summarizes the demographic projections for the City of San Luis Obispo that were used in calculating GHG efficiency thresholds for year 2030. As shown in Table 6, the numbers of residents, employees, and service persons are all anticipated to increase between 2016 and 2030.

Table 6 City of San Luis Obispo Demographic Projections

Metric	2016 Estimate	2030 Forecast	Net Increase from New Development (2016-2030)
Residents	46,117	53,934	7,817
Employees	50,985	59,723	8,738
Service Population ¹	71,610	83,796	12,186

¹ Per the method used by the City of San Luis Obispo Community Development Department, the service population is equal to the residential population plus half the number of employees.

Source: San Luis Obispo, City of. 2019. *Community Greenhouse Gas Emissions Inventory and Forecast*.

5.2 GHG Thresholds and Use

The GHG efficiency thresholds for residential, non-residential, and mixed-use projects built prior to December 31, 2030 are presented in Figure 5 and Table 7. If a plan or project’s emissions do not exceed the applicable threshold, then it is consistent with the City’s CAP and its GHG emissions impacts (both project- and cumulative-level) would not result in a cumulatively considerable impact related to GHG emissions and climate change and would, therefore, be less than significant. If a plan or project’s emissions exceed the applicable threshold, then mitigation measures must be identified and respective GHG emissions reduction calculations included within the respective CEQA review document in order to reduce plan or project GHG emissions to at or below the applicable threshold

level. These thresholds are applicable to the following plan and project types as identified in Title 17 (Zoning Regulations) Table 2-1 and defined in San Luis Obispo Municipal Code Section 17.156:

- **Residential.** Single-family dwellings, multi-family dwellings, boarding house, caretaker quarters, fraternities and sororities, high-occupancy residential uses, continuing care communities, mobile-home parks, or any combination of these uses.
- **Non-residential.** All Commercial uses (including office and retail uses), all Lodging uses, all Public and Quasi-Public uses, elderly and long term care, hospice in-patient facilities, family day cares, residential care facilities, supportive and/or transitional housing, sports and entertainment assembly facilities, all Industry, Manufacturing & Processing, and Wholesaling uses that are not subject to San Luis Obispo County Air Pollution Control District (SLOAPCD) stationary source permitting or the State cap-and-trade program, or any combination of these uses.
- **Mixed-use.** A combination of at least one residential and at least one non-residential land use specified above.

Figure 5 City of San Luis Obispo GHG Efficiency Thresholds

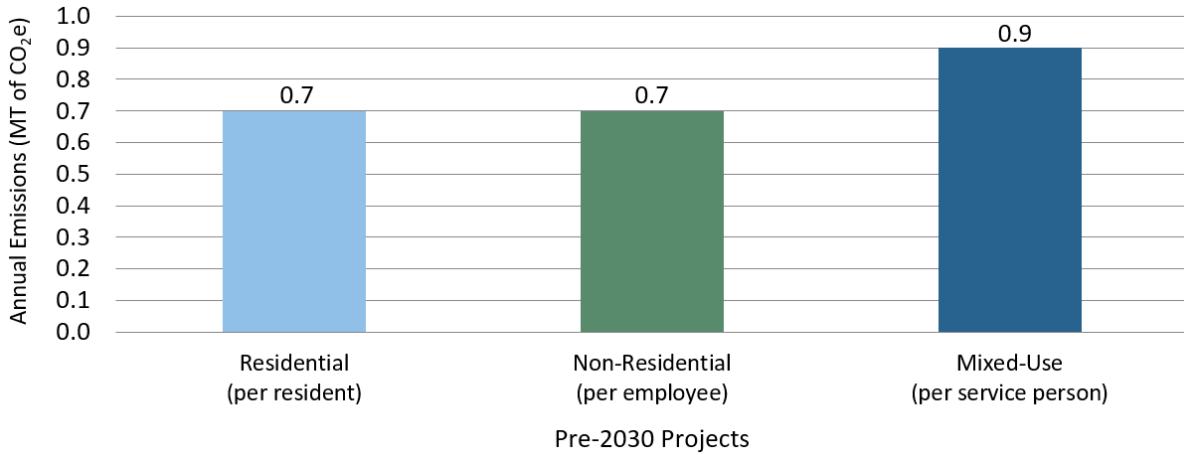


Table 7 City of San Luis Obispo Locally Applicable Plan- or Project-Specific CEQA GHG Emissions Thresholds

	2030 (New Development)		
	Residential	Non-Residential	Mixed-Use
GHG Emissions Forecast (MT of CO ₂ e per year) ¹	5,440	5,750	11,190
Demographic Metric ²	7,817 residents	8,738 employees	12,186 service persons
GHG Efficiency Threshold (MT of CO ₂ e per year)	0.7 per resident	0.7 per employee	0.9 per service person

MT = metric tons; CO₂e = carbon dioxide equivalents

¹ See Table 5.

² Demographic estimates are for new plans or projects only and were calculated using the forecasts in Table 6.

5.3 Justification for Thresholds

Per CEQA Guidelines Section 15064(b)(1), “the determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data.” In addition, CEQA Guidelines Section 15064(b)(2) states, “When using a threshold, the lead agency should briefly explain how compliance with the threshold means that the project’s impacts are less than significant.” Furthermore, CEQA Guidelines Section 15064.7(b) states “Thresholds of significance to be adopted for general use as part of the lead agency’s environmental review process must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence.” Therefore, the key considerations when developing thresholds of significance are 1) the thresholds’ basis on scientific and factual data; 2) demonstration of how compliance with the thresholds reduces project impacts to a less-than-significant level; 3) support of the thresholds by substantial evidence; and 4) adoption of the thresholds by ordinance, resolution, rule, or regulation, and developed through a public review process. The following subsections address these four key considerations.

Basis on Scientific and Factual Data

As discussed in Section 5.1, *Calculation Methodology*, the quantitative thresholds were developed using data from the City’s 2005 and 2016 communitywide GHG inventories and the GHG emissions forecasts for year 2030. These inventories and forecasts were developed by the City in compliance with all relevant protocols and guidance documents, including the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Local Government Operations Protocol, the Global Protocol for Community Scale GHG Emissions, and the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National GHG Inventories. Furthermore, the inventories and forecasts are based on locally appropriate data for the San Luis Obispo jurisdiction provided by Pacific Gas & Electric (PG&E), Southern California Gas Company, the City of San Luis Obispo Public Works and Utilities Departments, San Luis Obispo Air Pollution Control District (SLOAPCD), CARB, and Cold Canyon Landfill (City of San Luis Obispo 2019b).²⁴ Therefore, the emission inventory and forecast data underlying the thresholds is both scientific and factual.

As discussed in Section 2.3, *GHG Emissions Forecast*, implementation of the City’s CAP will achieve a 45 percent reduction in 1990 emissions levels by 2030. Therefore, this local target is more stringent than the State targets of a 40 percent emission reduction in 1990 levels by 2030 and makes substantial progress toward achieving the State’s long-term goal of carbon neutrality by 2045. The quantitative thresholds are tied directly to the level of GHG emissions anticipated for new development in the CAP for year 2030. As a result, because the CAP is consistent with the State’s 2030 GHG emission target, the quantitative thresholds are also consistent with the next State milestone GHG emission reduction target for 2030 and the State’s long-term goal of carbon neutrality by 2045. The State’s GHG emission reduction targets for 2030 and 2045 are set at the levels scientists say are necessary to meet the Paris Agreement goals to reduce GHG emissions and limit global temperature rise below two degrees Celsius by 2100 in order to avoid dangerous climate change (CARB 2017; EO B-55-18). Therefore, the City’s emission reduction targets that inform the CAP and the associated quantitative thresholds are based on scientific and factual data on the level

²⁴ San Luis Obispo, City of. 2019. Community Greenhouse Gas Emissions Inventory and Forecast.

of emissions reductions necessary to ensure the City does not have a cumulatively considerable contribution to the cumulative impact of climate change.

Reduction of Plan or Project Impacts to a Less-than-Significant Level

As shown in Table 5 in Section 5.1, *Calculation Methodology*, implementation of the City's CAP would reduce communitywide emissions by 45 percent by 2030. The quantitative thresholds are tied directly to the level of GHG emissions anticipated for new development in the CAP for year 2030. Therefore, the thresholds are consistent with the City's local emission reduction target, which is consistent with the State's GHG emission reduction targets. As mentioned in the preceding subsection, the State's GHG emission reduction targets for 2030 and 2045 are set at the levels scientists say are necessary to meet the Paris Agreement goals to reduce GHG emissions and limit global temperature rise below two degrees Celsius by 2100 in order to avoid dangerous climate change (CARB 2017; EO B-55-18). Therefore, the quantitative thresholds are set at the level necessary to ensure the City does not have a cumulatively considerable contribution to the cumulative impact of climate change. As a result, projects with GHG emissions at or below the quantitative thresholds would also not have a cumulatively considerable contribution to the cumulative impacts of climate change, and project impacts would be less than significant.

Support of Substantial Evidence

Substantial evidence regarding the calculation of the quantitative GHG emissions thresholds is provided in Section 5.1, *Calculation Methodology*. The following subsections provide additional evidence of how the GHG emissions thresholds are locally appropriate and plan- or project-specific; how the thresholds distinguish between existing and new development; and why interim year thresholds were developed.

Use of Local Data

The quantitative thresholds were developed using the City's communitywide GHG emissions forecasts for year 2030 and are therefore specific to the City of San Luis Obispo. The thresholds are directly tied to the population and employment growth anticipated by the City's (2014) General Plan Land Use and Circulation Elements as well as to the City-specific GHG emission reduction measures (i.e., pillars, measures, and foundational actions) that the City has proposed to reduce communitywide emissions. In addition, the magnitude of local GHG emission reductions achieved by State legislation/policies (i.e., vehicle fuel efficiency standards, the RPS, and Title 24) was estimated based on City-specific growth and vehicle miles travelled (VMT) forecasts. As a result, these locally appropriate thresholds directly address the concerns raised in the *Golden Door Properties, LLC v. County of San Diego/Sierra Club, LLC v. County of San Diego* (2018) case because they are based on local GHG emissions data rather than Statewide GHG emissions data.

Disaggregation of Existing versus New Development

The quantitative thresholds were developed by disaggregating the City's business-as-usual GHG emissions forecasts for year 2030 into emissions forecasts for existing and new development, which are shown in Table 5 in Section 5.1, *Calculation Methodology*. The emissions reductions specific to new development achieved by State legislation/policies and the CAP were then subtracted from the business-as-usual forecast to determine emissions "caps" of emissions from new residential and new non-residential development for year 2030. These "caps" were then divided by the numbers of residents, employees, and service persons forecasts for new development to determine efficiency

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thresholds for residential, non-residential, and mixed-use development, respectively. Therefore, these thresholds directly address the concerns raised in the *Center for Biological Diversity v. California Department of Fish and Wildlife (2015)* case regarding the different rates of GHG emissions reductions anticipated for new development as compared to existing development in order to meet the specified GHG reduction target.

Selection of Sector-Specific Thresholds

The quantitative thresholds are separated into three categories – residential, non-residential, and mixed-use – which are intended to apply to the three main types of development projects in San Luis Obispo. These thresholds were calculated by disaggregating the City’s business-as-usual GHG emissions forecasts for new development in year 2030 into emissions forecasts for new residential and new non-residential development, which are shown in Table 5 in Section 5.1, *Calculation Methodology*. The emissions reductions specific to new residential and new non-residential development achieved by State legislation/policies and the CAP were then subtracted from the business-as-usual forecast to determine “caps” of emissions for new residential and new non-residential development for year 2030. These emissions “caps” were then divided by the numbers of residents and employees forecast for new development in year 2030 to determine efficiency thresholds for residential and non-residential projects, respectively. For mixed-use development, the residential and non-residential emissions “caps” were summed, then divided by the service population forecast for new development in year 2030 to determine an efficiency threshold for mixed-use projects. As a result, these project-specific thresholds directly address the concerns raised in the *Center for Biological Diversity v. California Department of Fish and Wildlife (2015)* case because they are specific to each development project type.

Adoption via Public Review Process

In compliance with CEQA Guidelines Section 15064.7(b), this guidance document and the quantitative thresholds contained herein will be presented to the City Council for formal adoption via resolution through a public review process, which will include an opportunity for public input. The public review process for these City of San Luis Obispo CEQA GHG Thresholds and Guidance will specifically occur via public review of and comment on a joint CAP and CEQA GHG Thresholds and Guidance Draft IS-ND. The opportunity for public comment will also be available at a public hearing (i.e., City Council meeting) considering adoption of the CAP and CEQA GHG Thresholds and Guidance. This process directly addresses the concerns raised in the *Golden Door Properties, LLC v. County of San Diego/Sierra Club, LLC v. County of San Diego (2018)* case regarding formal adoption of new CEQA thresholds and how lead agencies should afford the opportunity for public review and input prior to adoption and use.

6 Quantifying GHG Emissions

There are a variety of analytical tools available to estimate project-level GHG emissions, including the California Emissions Estimator Model (CalEEMod),²⁵ which is a free, publicly available computer model developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with various air quality districts throughout the State. Alternative tools may be used to quantify emissions if they can be substantiated. In general, the most current version of CalEEMod should be used to calculate total emissions for discretionary development projects. The analysis should focus on carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) because these are the GHGs that most development projects would generate in the largest quantities. Fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluorides, should also be considered for the analysis. Emissions of all GHGs should be converted into their equivalent global warming potential in terms of CO₂ (CO₂e). Calculations should be based on the methodologies recommended by the CAPCOA and the SLOAPCD and include the use of guidance published by CARB.^{26, 27, 28}

6.1 Construction GHG Emissions

Construction activities emit GHGs primarily through combustion of fuels (mostly diesel) in the engines of off-road construction equipment and in on-road construction vehicles and in the commute vehicles of the construction workers. Smaller amounts of GHGs are emitted indirectly through the energy required for water used for fugitive dust control and lighting for the construction activity. Every phase of the construction process, including demolition, grading, paving, and building, emits GHG emissions in volumes proportional to the quantity and type of construction equipment used. Heavier equipment typically emits more GHGs per hour than lighter equipment because of its engine design and greater fuel consumption.

The SLOAPCD recommends amortizing construction-related GHG emissions over the life of the plan/project and adding amortized construction emissions to annual operational emissions for the purpose of providing a mechanism for the plan/project to mitigate these impacts alongside operational impacts. The SLOAPCD recommends an amortization period of 50 years for residential projects and 25 years for commercial projects.²⁹ The SLOAPCD does not provide a recommended amortization period for mixed-use projects; however, these projects should use a conservative amortization period of 30 years, which is consistent with the recommendations of the South Coast Air Quality Management District.³⁰

²⁵ The most current available version of CalEEMod should be used. As of January 2020, CalEEMod version 2016.3.2 is the most current version and should be used to quantify project-level emissions.

²⁶ California Air Pollution Control Officers Association. 2008. *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA)*. January 2008.

²⁷ SLOAPCD. 2012. CEQA Air Quality Handbook. April 2012. <https://www.slocleanair.org/rules-regulations/land-use-ceqa.php> (accessed January 2020).

²⁸ CARB. 2018. EMFAC2017 Volume III – Technical Documentation v.1.0.2. July 20, 2018. <https://ww3.arb.ca.gov/msei/downloads/emfac2017-volume-iii-technical-documentation.pdf> (accessed January 2020).

²⁹ SLOAPCD. 2012. CEQA Air Quality Handbook. April 2012. <https://www.slocleanair.org/rules-regulations/land-use-ceqa.php> (accessed January 2020).

³⁰ South Coast Air Quality Management District. 2008. Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold. October 2008. [http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-\(ghg\)-ceqa-significance-thresholds/ghgattachmente.pdf](http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf) (accessed February 2020).

CalEEMod generates a default construction schedule and equipment list based on the plan-/project-specific information, including land use, project size, location, and construction timeline.³¹ In general, if specific applicant-provided information is unknown, the default construction equipment list and phase lengths are the most appropriate inputs. However, if more detailed site-specific equipment and phase information (i.e., data from the project applicant) is available, the model's default values can (and should) be overridden.³²

6.2 Operational GHG Emissions

CalEEMod estimates operational emissions of CO₂, N₂O, and CH₄ generated by area sources, energy use, waste generation, and water use and conveyance as well as CO₂ and CH₄ generated by project-generated vehicle trips (i.e., mobile sources). Operational emissions should be calculated for year 2030, rather than the plan/project buildout year, in order to provide an appropriate comparison of project emissions to the year 2030 threshold.

Area Source Emissions

Area sources include GHG emissions that would occur from the use of landscaping equipment, hearths, and woodstoves, which emit GHGs associated with the equipment's fuel combustion. The landscaping equipment emission values in CalEEMod are derived from the 2011 Off-Road Equipment Inventory Model.³³ Emission rates for combustion of wood and natural gas for wood stoves and fireplaces are based on those published by the U.S. EPA in Chapter 1.9 of AP-42. Typically, no adjustments to landscaping equipment inputs are necessary. The number of hearths and woodstoves should be adjusted to reflect the project design.

Energy Use Emissions

GHGs are emitted on-site during the combustion of natural gas for cooking, space and water heating, and decorative uses and off-site during the generation of electricity from fossil fuels in power plants. CalEEMod estimates GHG emissions from energy use by multiplying average rates of residential and non-residential energy consumption by the quantities of residential units and non-residential square footage entered in the land use module to obtain total projected energy use. This value is then multiplied by electricity and natural gas GHG emission factors applicable to the plan/project location and utility provider. Building energy use is typically divided into energy consumed by the built environment and energy consumed by uses that are independent of the building, such as plug-in appliances. Non-building energy use, or "plug-in energy use," can be further subdivided by specific end-use (refrigeration, cooking, office equipment, etc.). In California, Title 24 governs energy consumed by the built environment, mechanical systems, and some types of fixed lighting.

Electricity emissions are calculated by multiplying the energy use by the carbon intensity of the utility district per kilowatt hour.³⁴ Projects would be served either by Monterey Bay Community Power or by PG&E. The specific energy intensity factors (i.e., the amount of CO₂, CH₄, and N₂O per

³¹CAPCOA. 2017. California Emissions Estimator Model User Guide: Version 2016.3.2. Prepared by BREEZE Software, A Division of Trinity Consultants in collaboration with South Coast Air Quality Management District and the California Air Districts. <http://www.aqmd.gov/caleemod/user's-guide> (accessed January 2020).

³²Ibid.

³³Ibid.

³⁴Ibid.

kilowatt-hour) for the applicable utility should be used in the calculations of GHG emissions. CalEEMod does not include Monterey Bay Community Power as a utility company choice; therefore, users must select “User Defined” and manually enter energy intensity factors. Users should contact the City's Community Development Department for the most recent energy intensity factors for Monterey Bay Community Power's current mix of power. For projects served by PG&E, the energy intensity factors included in CalEEMod are based on 2009 data by default at which time PG&E had only achieved a 14.1 percent procurement of renewable energy.³⁵ Per SB 100, the Statewide Renewable Portfolio Standard (RPS) Program requires electricity providers to increase procurement from eligible renewable energy sources to 33 percent by 2020 and 60 percent by 2030. Users should contact the City's Community Development Department for the most recent energy intensity factors for PG&E.

Energy emissions should also be adjusted to account for the effects of new iterations of Title 24. For examples, CalEEMod version 2016.3.2 does not account for the requirements of the 2019 Title 24 standards, which went into effect on January 1, 2020. According to the California Energy Commission, single-family homes and nonresidential buildings built to the 2019 Title 24 standards will use approximately 7 percent and 30 percent less energy, respectively, due to more stringent energy efficiency measures and lighting upgrades. Therefore, energy usage from single-family residential usage should be reduced by 7 percent, and non-residential energy usage should be reduced by 30 percent to account for the requirements of 2019 Title 24 standards.³⁶

In accordance with Section 150.1(b)14 of the 2019 Building Energy Efficiency Standards, all new residential uses three stories or less must install photovoltaic (PV) solar panels that generate an amount of electricity equal to expected electricity usage. The calculation method contained in Section 150.1(b)14 of the 2019 Building Energy Efficiency Standards should be utilized to estimate the number of kilowatts of PV solar panels that would be required for a residential project three stories or less. In addition, modeling should account for local regulations pertaining to mandatory solar provisions.³⁷ Online resources can be used to determine the amount of kilowatt-hours that would be generated per year by the required solar PV system.³⁸ The energy reduction achieved by on-site PV solar panels should be included in CalEEMod.

Mobile Source Emissions

CalEEMod quantifies mobile source emissions of CO₂, and CH₄. If available, project-specific trip generation rates or VMT data should be input in CalEEMod. To calculate mobile source emissions, CalEEMod uses CO₂ emission factors from the EMFAC2014 Emissions Inventory based on the aggregated model year and aggregated speed and CH₄ emission factors provided by CARB for the plan/project's first year of full operations.³⁹ Because CalEEMod does not calculate N₂O emissions

³⁵ California Public Utilities Commission. 2011. Renewables Portfolio Standard Quarterly Report. 1st Quarter 2011. <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=5858> (accessed January 2020).

³⁶ California Energy Commission. 2019. “2019 Building Energy Efficiency Standards.” March 2018. https://ww2.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf (accessed January 2020).

³⁷ In 2020, the City Council will consider adoption of the Clean Energy Choice Program for New Buildings, which may include solar requirements for other types of land uses.

³⁸ Zientara, Ben. 2019. “How much electricity does a solar panel produce?” Last updated: November 6, 2019. <https://www.solarpowerrocks.com/solar-basics/how-much-electricity-does-a-solar-panel-produce/> (accessed March 2020).

³⁹ CAPCOA. 2017. California Emissions Estimator Model User Guide: Version 2016.3.2. Prepared by BREEZE Software, A Division of Trinity Consultants in collaboration with South Coast Air Quality Management District and the California Air Districts. <http://www.aqmd.gov/caleemod/user's-guide> (accessed January 2020).

from mobile sources, N₂O emissions should be quantified using guidance from CARB and the EMFAC2017 Emissions Inventory.^{40, 41}

Water and Wastewater Emissions

The amount of water used, and the amount of wastewater generated by a plan/project generate indirect GHG emissions. These emissions are a result of the energy used to supply, convey, and treat water and wastewater. In addition to the indirect GHG emissions associated with energy use, the wastewater treatment process itself can directly emit both CH₄ and N₂O.

The indoor and outdoor water use consumption data for each land use subtype comes from the Pacific Institute's (2003) *Waste Not, Want Not: The Potential for Urban Water Conservation in California*.⁴² Based on that report, a percentage of total water consumption is dedicated to landscape irrigation, which is used to determine outdoor water use. Wastewater generation is similarly based on a reported percentage of total indoor water use.

New development will be subject to CalGreen, which requires a 20 percent increase in indoor water use efficiency. Thus, in order to account for compliance with CalGreen, a 20 percent reduction in indoor water use should be included in the water consumption calculations for new residential, non-residential, and mixed-use development. In addition to water reductions associated with building code compliance and project design features, the GHG emissions from the energy used to transport the water for development should also account for compliance with the RPS using the guidance provided under "Energy Use Emissions."

Solid Waste Emissions

The disposal of solid waste produces GHG emissions from the transportation of waste, anaerobic decomposition in landfills, and incineration. To calculate the GHG emissions generated by solid waste disposal, the total volume of solid waste is calculated using waste disposal rates identified by the California Department of Resources Recycling and Recovery (CalRecycle). The methods for quantifying GHG emissions from solid waste are based on the IPCC method, using the degradable organic content of waste. Users should contact the City's Community Development Department to obtain the most recent solid rate diversion rate to be included in the calculation of solid waste GHG emissions.

Plan or Project Design Features

Users should use the "Mitigation" tabs to include project design features applicable to the plan/project.⁴³ These features often include increased density, improved destination accessibility, proximity to transit, integration of below market rate housing, unbundling of parking costs, provision of transit subsidies, implementation of alternative work schedules, use of energy- and/or water-efficient appliances, use of reclaimed and/or grey water, and installation of water-efficient irrigation system. Users should consider the applicability of these features to the plan/project and

⁴⁰ CARB. 2018. EMFAC2017 Volume III – Technical Documentation v.1.0.2. July 20, 2018.
<https://ww3.arb.ca.gov/msei/downloads/emfac2017-volume-iii-technical-documentation.pdf> (accessed January 2020).

⁴¹ CARB. 2019. EMFAC2017 Web Database. <https://www.arb.ca.gov/emfac/2017> (accessed January 2020).

⁴² CAPCOA. 2017. California Emissions Estimator Model User Guide: Version 2016.3.2. Prepared by BREEZE Software, A Division of Trinity Consultants in collaboration with South Coast Air Quality Management District and the California Air Districts.
<http://www.aqmd.gov/calemod/user's-guide> (accessed January 2020).

⁴³ "Mitigation" is a term of art for the modeling input and is not equivalent to mitigation measures that may apply to the CEQA impact analysis.

review the CAPCOA *Quantifying Greenhouse Gas Mitigation Measures* (2010) publication to ensure that the chosen features are relevant and feasible in light of the plan/project.⁴⁴

Residents, Employees, and Service Populations

The quantitative thresholds presented in Chapter 5, *Utilizing Quantitative CEQA GHG Thresholds*, are expressed in terms of per resident for residential projects, per employee for non-residential projects, and per service person for mixed-use projects. Estimates of the resident, employee, or service population for a plan/project should be based on substantial evidence. The City of San Luis Obispo Community Development Department defines service population as defined as the number of residents plus half the number of employees for a given project.⁴⁵ Data provided by the applicant as well as the following resources may be utilized in estimating resident and employee populations:

- **City of San Luis Obispo Community Development Department.** Users should contact the City's Community Development Department for the most recent estimate of persons per household in San Luis Obispo. This estimate can be multiplied by the number of proposed residential units to estimate a plan/project's resident population.
- **Proposed Number of Beds.** For projects such as group homes, assisted living facilities, nursing homes, or similar uses, the number of beds can be used to determine the resident population.
- **United States Green Building Council.** The United States Green Building Council has published a summary of building area per employee by business type. These rates, which are expressed in terms of square feet per employee, can be utilized to estimate the number of employees a plan/project would require. This document is included as Appendix D.

6.3 Modeling GHG Emissions from Existing Land Use

For a plan/project that would result in a change in the plan area/project's site General Plan land use designation, emissions anticipated for the existing (2014) General Plan land use designation must be calculated in conjunction with emissions for the proposed plan/project to demonstrate whether the plan/project would be more or less GHG-intensive than development anticipated for the existing (2014) General Plan land use designation for the site. In this case, GHG emissions should be reported for both the existing and proposed scenarios. Emissions anticipated for the existing land use should be quantified using the methods described in Section 6.1, *Construction Emissions*, and Section 6.2, *Operational Emissions* with consistent assumptions between the two scenarios as applicable. Any emission reduction credits applied to the proposed plan/project scenario that are related to State legislation/policies (e.g., the RPS, vehicle standards, Title 24) or the plan area/project site location (e.g., proximity to transit, destination accessibility, etc.) should also be applied to the existing scenario. Emission reduction credits that are specific to the proposed plan/project (e.g., use of recycled water, increased density, installation of energy and/or water-efficient appliances, integration of below market rate housing, etc.) should only be included for the proposed plan/project scenario. In addition, care should be taken to identify any emission reduction credits that might be unique to the existing land use designation that would not apply to the proposed plan/project. For example, if the existing land use designation allows for single-family residences and the proposed land use designation would allow for only commercial uses, then the existing scenario should include the emission reduction credit associated with the 2019 Building

⁴⁴ CAPCOA. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. August 2010. <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf> (accessed January 2020).

⁴⁵ San Luis Obispo, City of. 2019. *Community Greenhouse Gas Emissions Inventory and Forecast*.

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Energy Efficiency Standards requirements for PV solar panels on residential uses that are three stories or less whereas the proposed plan/project scenario should not include this credit unless PV solar panels are included as a plan/project design feature.

7 Moving into the Future

Full implementation of the City's CAP will reduce communitywide GHG emissions by approximately 66 percent below 1990 levels by 2035, which would leave a gap of approximately 111,030 MT of CO₂e per year that will need to be addressed to achieve carbon neutrality. This gap represents emissions that could be addressed by laws, regulations, policies, programs, and ordinances set forth by the federal and State governments, regional agencies, and local partners. The gap also represents the uncertainty that the City faces in taking a leadership role in addressing a challenge that has not been solved before. The City is committed to embracing that uncertainty, committing to constant learning, engaging in systemic change using the tools and actions that local governments are uniquely suited to carry out, and positioning itself to take full advantage of future innovations, technologies, and policies and legislation that may be undertaken at the State and federal level. Technological innovation, clean-tech innovation, and changes to climate related policy and regulation occur rapidly. Several of the State's most successful environmental policy initiatives, including the RPS, also had a gap between what was known at the time of adoption and eventual successful implementation. By committing to the ambitious target of carbon neutrality by 2035, the City intends to catalyze innovation, invite resources from funding sources and partners, and provide climate leadership.

The CAP acknowledges that additional actions beyond those identified in the plan will be necessary to achieve carbon neutrality and therefore provides a mechanism for updating and adopting a new climate action plan every other financial plan cycle (i.e., in conjunction with the 2023-2025, 2027-2029, and 2031-2033 cycles) in order to incorporate new measures and innovative technologies that will further the City toward meeting its goal of carbon neutrality.⁴⁶ As the CAP is updated, the associated CEQA GHG Emissions Analysis Compliance Checklist will also be updated as needed to incorporate new pillars, measures, and/or foundational actions that discretionary development projects will need to incorporate, as applicable, to demonstrate consistency with the CAP. At the time at which the City identifies measures to achieve its carbon neutrality goal in totality, the City will adopt those measures in a public process following CEQA review, at which time the CAP will become a qualified GHG emission reduction plan for projects with post-2030 buildout years. However, the quantitative thresholds included in this guidance document will not need to be updated because residential, non-residential, and mixed-use projects with post-2030 buildout years will still need to achieve GHG emissions equivalent to 0 MT of CO₂e per year to demonstrate consistency with the City's CAP.

In addition, if future amendments or updates of the City's General Plan Land Use and Circulation Elements occur, then these amendments or updates will be incorporated into future updates of the CAP to ensure that project applicants can continue to utilize the streamlining process, which is partly dependent on a plan/project's consistency with the demographic forecasts and land use assumptions based on the General Plan Land Use and Circulation Elements, to the greatest extent practicable.

⁴⁶ San Luis Obispo, City of. 2019. Carbon Neutrality Vision and Three-Year Strategic Plan Technical Report. November 2019.

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