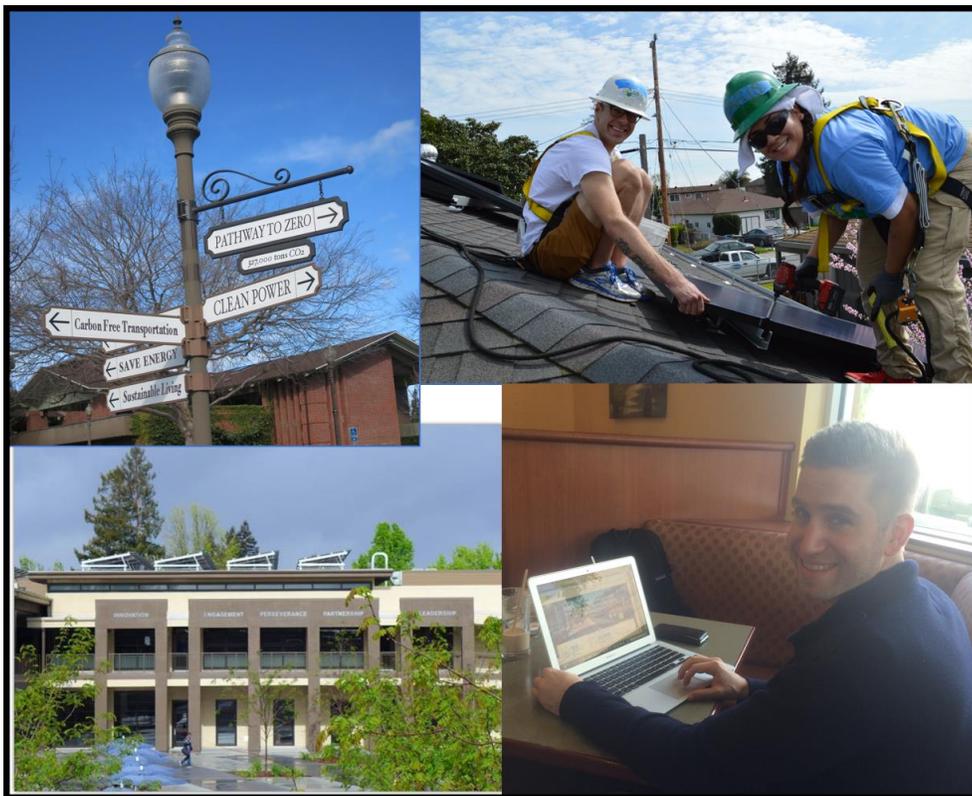


Peninsula Advanced Energy Community (PAEC) Task 2.4: Final Gap Analysis Report



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Climate Neutral for a Healthy, Prosperous Menlo Park

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About the Authors

Menlo Spark

Menlo Spark is a nonprofit initiative that is collaborating with city government, businesses, and residents to achieve a climate-neutral Menlo Park within ten years. By helping to weave together novel energy, transportation, land use and building policies and projects in the city that contribute to sustainability, Menlo Spark is spearheading a unified strategy for progress towards the ultimate goal of carbon neutrality. To learn more about Menlo Spark, visit www.menlospark.org.

About the Clean Coalition

The Clean Coalition is a nonprofit organization whose mission is to accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise.

The Clean Coalition drives policy innovation to remove barriers to procurement and interconnection of distributed energy resources (DER) — such as local renewables, advanced inverters, demand response, and energy storage — and we establish market mechanisms that realize the full potential of integrating these solutions. The Clean Coalition also collaborates with utilities and municipalities to create near-term deployment opportunities that prove the technical and financial viability of local renewables and other DER.

Visit us online at www.clean-coalition.org.

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Legal Disclaimer

This document was prepared as a result of work sponsored by the California Energy Commission. It does not necessarily represent the views of the Energy Commission, its employees, or the State of California. Neither the Commission, the State of California, nor the Commission's employees, contractors, or subcontractors makes any warranty, express or implied, or assumes any legal liability for the information in this document; nor does any party represent that the use of this information will not infringe upon privately owned rights. This document has not been approved or disapproved by the Commission, nor has the Commission passed upon the accuracy of the information in this document.

I. Overview

The following GAP analysis covers the most current relevant practices for increasing and supporting local renewable energy (RE), energy efficiency (EE), zero net energy (ZNE) building policy, electric vehicle charging and infrastructure (EVCI), and related policies within the jurisdictions of Atherton, East Palo Alto, Menlo Park, Redwood City and San Mateo County (unincorporated areas). These practices include “reach” codes, green building codes, mandates and permitting processes, as well as any other relevant policies and programs. This report also contains recommendations for each jurisdiction to update or introduce new policies and programs to advance towards the best practices identified in the related report of PAEC Task 2.1.

Many San Mateo County cities have clean energy programs in place as a result of state programs. In 2006, the California state Assembly Bill 32 and California’s Global Warming Solutions Act of 2006 was signed into law. Assembly Bill 32 committed the state to reduce its greenhouse gas emissions (GHGs) to 1990 levels by 2020, with 15 percent below 2005 levels by 2020 to be considered an equivalent goal.¹ In 2016, Senate Bill 32 extended the state’s targets for reducing GHGs from 2020 to 2030. Under SB 32, the state will reduce greenhouse gas emissions 40 percent below 1990 levels by 2030, with 49 percent below 2005 levels by 2030 as an equivalent goal.

San Mateo County together with its cities have recognized the potential issues associated with climate change, and partnered with the Bay Area Air Quality Management District (BAAQMD), the Local Governments for Sustainability (formerly known as ICLEI), the City and County Association of Governments (C/CAG) of San Mateo County, and San Mateo County Energy Watch to develop clean energy measures and Climate Action Plans with the following objectives:

- Demonstrate environmental leadership;
- Promote energy and water efficiency;
- Promote creativity and innovation in pursuit of state environmental initiatives;
- Promote sustainable development and activities;
- Create programs and incentives to help educate and foster these goals; and
- Build resiliency to help prepare communities for extreme weather events.

II. San Mateo County

San Mateo County has demonstrated a strong commitment to clean energy, climate, and sustainability by establishing an Office of Sustainability in July 2014. The County strives to improve the sustainability of its operations and the greater community through work in

¹ <https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

areas of renewable energy and energy efficiency; resource conservation; alternative transportation; and greenhouse gas emission reductions.

The San Mateo County Climate Action Plan identifies a GHG emissions reduction target of 17% below baseline levels by 2020 for the County, which goes beyond the 15% required by the state by 2020. To achieve this, numerous energy, land use, waste and water strategies must be developed and adopted.² In 2012, the county added an energy and climate-change element to its climate action plan, zoning and building codes in response to AB 32, the California Global Warming Solutions Act. This Act requires the state to reduce its GHG emissions to 1990 levels by 2020. The county-level equivalent of that effort is to achieve a 15 percent reduction from current emission levels by 2020.³

The Climate Action Plan (CAP) also includes a section on the factors making San Mateo County vulnerable to global warming and how it can adapt. Coastal areas of the County are facing sea level rise and continued sea cliff erosion.⁴

A. GHG Emission Reduction Update

Emissions from San Mateo County totaled almost 6 million tons of GHGs when last measured in 2010.⁵ The energy sector was the largest contributor of GHGs in 2010.⁶ The commercial and industrial energy sectors contributed approximately 1,147,489 tons of GHGs, while residential energy use contributed 1,025,513 metric tons.⁷

The National Cool County declaration in 2007 committed the County to assessing GHG emissions every five years. The County also is committed to current actions to reduce emissions and to develop a plan to reduce the 2005 emissions by 80% by 2050 with an intermediate goal of flat emissions by 2010.⁸

Through the Regional Integrated Climate Action Planning Suite (RICAPS) every city in San Mateo County has the opportunity to develop its own CAP using tools developed by City/County Association of Government (C/CAG) in conjunction with DNV GL.⁹ CAPs developed

² "PMC." <http://pmcworld.com>- *Energy Efficiency Climate Action Plan, General Plan Amendments, Energy and Climate Change Element*, a. Bay Area Climate & Energy Resilience Project (BACERP), Mar. 2014. Web. 23 July 2016.

³ "San Mateo County Board of Supervisors Vote to Fund Study to Establish a Local Renewable Energy Agency."

[Http://green.smcgov.org](http://green.smcgov.org). San Mateo County Office of Sustainability 21, n.d. Web. 21 July 2016.

⁴ Scott, Julia. "San Mateo County Gets to Work on Energy-efficiency Plan." [Http://www.mercurynews.com](http://www.mercurynews.com). N.p., 8 Oct. 2011. Web. 20 July 2016.

⁵ "Open San Mateo County." Data.smcgov.org. San Mateo County, n.d. Web. 28 July 2016.

⁶ (n.d.): n. pag. "County of San Mateo GHG Inventory". <http://www.sustainablesanmateo.org> San Mateo County, Dec. 2010. Web. 20 July 2016.

⁷ San Mateo County, Dec. 2010.

⁸ "Climate Change." [Http://green.smcgov.org](http://green.smcgov.org). San Mateo County, n.d. Web. 21 July 2016. Note that the 2010 goal was very close to being achieved, but emissions did not meet or dip below 2005 levels until 2012 – just a few years later. See, for example: <https://performance.smcgov.org/stories/s/Unincorporated-San-Mateo-County-Climate-Planning/ugat-433i>

⁹ This project was funded by grants from the Bay Area Air Quality Management District (BAAQMD) and PG&E.

from these tools will meet BAAQMD's California Environmental Quality Act (CEQA) guidelines for a Qualified GHG Reduction Strategy.¹⁰

B. Local Government Planning and Permitting

Advanced Energy Communities include a wide variety and number of components. Most of these – local renewable energy (RE), energy efficiency (EE), zero net energy (ZNE), and electric vehicle charging and infrastructure (EVCI) projects – require approval by one or more local permitting agencies. Within the PAEC, the agencies responsible for approval are the local municipal building and planning departments (Atherton, East Palo Alto, Menlo Park, and Redwood City), San Mateo County's Planning and Building Department for unincorporated parts of the County, and the Menlo Park Fire Protection District, which covers Atherton, East Palo Alto, Menlo Park, and the surrounding unincorporated areas. The municipalities and the County also have Planning Commissions that are tasked with reviewing and approving projects within their jurisdictions. There is obvious overlap, particularly with the Menlo Park Fire Protection District, which reviews building plans for compliance with the California Fire Code.

Current permitting procedures are often immature with respect to AEC projects. Permitting and approval can take too long, cost too much, and require complex coordination across multiple departments/agencies that are often unfamiliar with the technology and associated regulations.

C. Energy Efficiency

The County's Energy Efficiency Climate Action Plan (EECAP) identifies San Mateo's long-term vision to reduce GHG emissions and adapt to climate change impacts.¹¹ The EECAP supports for the state's GHG reduction targets, through reduced utility power use by 25 percent below 2005 levels through conservation, efficiency and increased local production of clean energy. This Plan achieves the intent of the EECBG Program by creating a strategy to reduce community-wide energy use, reduce fuel combustion through more efficient transportation and land use patterns, and spurring growth in local energy efficiency industries.¹²

San Mateo County's Office of Sustainability promotes energy efficiency through its work with the Bay Area Regional Energy Network (Bay REN) to implement effective energy savings programs on a regional level.¹³ Bay REN offers four different programs to help

¹⁰ "RICAPS." [Http://smcenergywatch.com](http://smcenergywatch.com). N.p., n.d. Web. 23 July 2016.

¹¹ "PMC." - *Energy Efficiency Climate Action Plan, General Plan Amendments, Energy and Climate Change Element, a*. Bay Area Climate & Energy Resilience Project (BACERP), Mar. 2014. Web. 23 July 2016.

¹² County, San Mateo. "Energy Efficiency Climate Action Plan of San Mateo County." (n.d.): n. pag. [Http://green.smcgov.org](http://green.smcgov.org). San Mateo County, June 2013. Web. 26 July 2016.

¹³ <http://green.smcgov.org/changing-future-energy-san-mateo-county>

County residents, business owners, and contractors reduce their energy consumption, while saving money. The County also helps staff the Energy Watch program, which assists local governments, small businesses, schools, farms, non-profit organizations, and some low-income residences.¹⁴ In addition to providing no-cost energy audits, special incentives, and benchmarking services, SMC Energy Watch assists cities with climate action planning and GHG inventoring. SMC Energy Watch also hosts classes and trainings about energy efficiency.

D. Zero Net Energy Buildings

Statistics show that buildings are the primary energy consumer in the U.S.¹⁵ This fact underscores the importance of targeting building energy use as a key to decreasing the nation's energy consumption. The building sector can significantly reduce energy use by incorporating energy-efficient strategies, construction and undertaking retrofits to improve the efficiency of existing buildings.

In 2008, the California Public Utilities Commission (CPUC) adopted California's first Long Term Energy Efficiency Strategic Plan, presenting a single roadmap to achieve maximum energy savings across all major sectors in California. This plan, along with the 2007 Integrated Energy Policy Report, adopted zero net energy goals for new construction in California. These goals are as follows: 1) All new residential construction will be ZNE in 2020 and 2) All new commercial buildings will be ZNE in 2030.¹⁶

San Mateo County plans to address GHGs from the county's building infrastructure through a Zero Energy (ZE) Strategic Plan. This strategic plan will support ZE policy development and implementation of ZE projects in San Mateo County. The Strategic Plan will outline how to provide technical support and resources to Cities, and facilitate workforce development surrounding ZE construction.¹⁷ SMCEW ZNE will be customizing ZE Action Plan Template to fit each city. In order to make participation from cities as easy as possible, ZE Action Template that will have customizable measures like: 1) Commitment to ZE for all new or majorly remodeled municipal facilities, 2) Commitment to implement ZE building incentives and to provide education to building applicants in their city, 3) Commitment to consider developing ZE reach codes or other ZE building ordinances, and 4) Promote and encourage ZE professional development through workforce trainings and resources.¹⁸

¹⁴ <http://www.smcenergywatch.com/about-us/background>

¹⁵ "What Are the Major Sources and Users of Energy in the United States?" *EIA.GOV*. Energy Information Administration, 29 Dec. 2015. Web. 17 June 2016.

¹⁶ San Mateo County Zero Energy Strategic Plan Draft, Dec. 2015.

¹⁷ Building'S, A., and Energy Usage At Each Moment. These Buildings Are Still Connected To The Utility Gr. *Zero Energy Strategic Plan Draft By San Mateo County Energy Watch December 2015* (n.d.): n. pag. [Http://www.smcenergywatch.com](http://www.smcenergywatch.com). San Mateo County, Dec. 2015. Web. 27 July 2016.

¹⁸ The reach codes mentioned above are from Title 24, also known as the California Building Standards Code. These codes are intended to have a direct influence on hot water insulation, seals on doors and windows to help improve home heating and cooling efficiency.

San Mateo County Zero Energy Strategic Plan Draft, Dec. 2015.

San Mateo County aims to have 50% of all new buildings built with ZE in 2025. The County will also provide trainings for building professionals, real estate professionals and homeowners in an effort to have prepared the California workforce for when ZE becomes code in 2020.¹⁹

San Mateo County adopted LEED Silver building policy for all County Buildings. There has been longstanding support for sustainable building policies covering energy, water, waste and transportation.

E. EV Charging Infrastructure

Electric vehicle charging stations are an important way to incentivize a transition to vehicles that minimize GHG emissions, and for the cities to lead by example. The county of San Mateo currently has over 50 EV charging stations according to the EV Charging map. By 2020 the county would like to have 100 Neighborhood Electric Vehicles and installation of 200 EV charging stations in the county. The county would like to increase the number of Neighborhood Electric Vehicles to 300 and installation of 500 EV charging stations by 2035.²⁰ In November 2016, *EV Charge Up!* The County's Electric Vehicle Charging Program was released.²¹

F. Resilient, Sustainable Communities and Recommendations

Pacific Municipal Consultants, Inc. (PMC) partnered with ICLEI Local Governments for Sustainability USA to develop a vulnerability assessment for unincorporated San Mateo County.²² PMC also prepared an adaptation strategy - one of the first in the Bay Area to respond to the 2012 California Adaptation Planning Guide.²³

The 2012 San Mateo Energy Strategy is a comprehensive and collaborative effort addressing: 1) the increasing financial costs of energy in the Bay Area, 2) Climate & Energy Resilience Project, 3) the impact of energy infrastructure on local communities, and 4) increasing concerns about climate change and its effects.²⁴

San Mateo County has teed up many effective clean energy programs, not only for the unincorporated areas under County authority but offering services and resources to the

¹⁹ San Mateo County Zero Energy Strategic Plan Draft, Dec. 2015.

²⁰ County, San Mateo. CAP June 2013.

²¹ <http://green.smcgov.org/electricvehiclecharging>

²² PMC is a privately owned California corporation with a mission to provide planning, environmental and municipal services to public agencies, special districts, and public-oriented organizations.

²³ "PMC." - *Energy Efficiency Climate Action Plan, General Plan Amendments, Energy and Climate Change Element*, <https://green.smcgov.org>. a. Bay Area Climate & Energy Resilience Project (BACERP), Mar. 2014. Web. 23 July 2016.

²⁴ San Mateo County Climate Adaptation/Resilience Snapshot. Mar. 2014.

cities. The County is collaborating with many stakeholders on a number of new model ordinances and policies to promote Advanced Energy communities.

III. Town of Atherton

The Town of Atherton has a number of clean energy programs and an active Environmental Program Committee (EPC). Notably, a very sustainable civic center building project is underway, which is entirely covered by a separate PAEC product deliverable.

The Town of Atherton, along with the other cities within San Mateo County, have been working with San Mateo County Energy Watch and the energy-consulting firm DNV GL to complete a Climate Action Plan (CAP). City staff and the EPC have worked with DNV GL since 2014 to develop specific GHG reduction measures, and draft the CAP. In November 2015, following into February and March 2016, the City Council conducted study sessions to discuss and consider draft GHG reduction measures, and a draft CAP as recommended by the EPC.²⁵ The City Council adopted a Final Climate Action Plan for the Town on October 19, 2016.²⁶

A. GHG Emission Reduction Update

The Town of Atherton has a goal of reducing GHGs 17% by 2020 from 2005 levels. GHGs totaled approximately 72,731 metric tons of CO₂e in the base year of 2005. The Town of Atherton has also completed an inventory for 2010, showing a modest one percent reduction in emissions. Electricity and natural gas consumption by all community sectors (residential, commercial, and municipal activities) accounts for 54% percent of total GHG emissions in the Town of Atherton; with natural gas contributing two thirds of GHGs within the energy sector. Transportation is the second largest contributor to GHGs.

The Climate Action Plan is designed to place the Town of Atherton on a path to achieve at least a 17% reduction in emissions below 2005 levels by 2020. While the Climate Action Plan in its current form does not put The Town of Atherton on course to achieve a 49% reduction in emissions below 2005 levels by 2030 in accordance with the State's goal, the Town of Atherton will continue to explore new measures over the coming years that work towards achieving this ultimate goal.

B. Local Renewable Energy

The Town of Atherton, along with the 19 other San Mateo county cities, joined Peninsula Clean Energy in 2016.²⁷ This Community Choice Aggregation (CCA) Program, enabled by California legislation (AB117), allows local governments to purchase and generate power to sell

²⁵ Sanders, Lisa Costa. "CITY COUNCIL STAFF REPORT – STUDY SESSION." <http://ca-atherton.civicplus.com/DocumentCenter/View/2820>. City of Atherton, 2 Mar. 2016. Web. 29 July 2016. Pg:97

²⁶ <http://www.ci.atherton.ca.us/DocumentCenter/View/3535>

²⁷ "Peninsula Clean Energy Community Choice Aggregation." www.ci-atherton.ca.us. City of Atherton, n.d. Web. 2 Aug. 2016.

to residential and business customers. The Town of Atherton has opted for the ECO100 option (100% renewable energy) for all Town facilities. In the future there may be interest in a rooftop solar ordinance.²⁸

The Town of Atherton has a new renewable energy policy as part of the recently adopted CAP. The Town of Atherton will review and consider installation of solar or other renewable energy projects at Town facilities, where practical and financially feasible. The Town of Atherton will also conduct an initial feasibility study to set a goal for on-site renewable projects.

C. Energy Efficiency

Majority of the Town of Atherton's existing homes were built prior to the adoption of the California Title 24 Energy Code, and these homes have significant potential to increase energy efficiency. The Town of Atherton's buildings in an average year generate 41,019 mtCO₂. Most of the gas use in the Town of Atherton is residential 87% and 75% of all electricity use is residential.²⁹

The California Public Utility Commission's (CPUC) 2008 Strategic Plan, updated in 2011, calls for new net zero energy homes and a 40% improvement of the existing home stock by 2020. The household energy use per capita in The Town of Atherton is approximately three times higher than the average energy use per household in San Mateo County. Typically, homes (that have not yet taken any steps towards efficiency) can increase energy efficiency 30% to 40%, with comprehensive energy efficiency upgrades.

Energy efficiency measures that have been adopted by The Town of Atherton through its recent Climate Action Plan are to consider a green building ordinance, promote PG&E commercial and industrial energy efficiency/demand response programs, replace all public lighting with LED bulbs, increase shade trees, and promote energy efficiency in municipal buildings, including:

- Consideration of a voluntary residential green building ordinance for new construction that would encourage achievement of CALGreen Tier 2 energy performance and planting of shade trees for new construction with eastern, southern or western exposure, when feasible.
- Incorporation of available residential Energy Upgrade programs and similar rebates to increase energy efficiency and water conservation through professional home energy audits. The Program may include recognition awards, a Residential Energy and Water Efficiency Checklist, public outreach, and expanded promotion of

²⁸ Personal communication with Town Council Members, Rick DeGolia and Elizabeth Lewis, 2/13/17.

²⁹ San Mateo County Energy Watch. *Buildings in an Average Year Atherton*: (n.d.): n. pag. [Http://smcenergywatch.com](http://smcenergywatch.com). San Mateo Energy Watch. Web. 30 July 2016.

rebates/programs funded through PG&E and other organizations among other features.

- Implement programs for residential shade trees, including education and outreach to encourage existing homes to plant deciduous shade trees for houses with eastern, western or southern exposures that heat up during the summer and create alternatives as to not conflict with the priority installation of solar panels. The Atherton Tree Committee will be enlisted to assist in planting of trees.
- Promotion of PG&E commercial energy efficiency and demand response programs with marketing and outreach, and leverage existing rebates and new rebates.
- Replace street, signal lights, parks and parking lot lighting with efficient lighting (LEDs, induction, etc.) where feasible.
- Implement a sustainable purchasing policy that emphasizes ENERGY STAR equipment.
- Encourage all new Town of Atherton facilities be built to Net Zero Energy if financially feasible and where practical. Audit older Town facilities for energy efficiency opportunities and implement energy efficient retrofits if financially feasible. Leverage benchmarking through San Mateo County Energy Watch to identify opportunities for EE upgrades and tracking energy performance.
- Implement municipal program for shade trees within public right-of-way and Town facilities with eastern, western or southern exposure that heat up during the summer.

D. Zero Net Energy Buildings

The Town of Atherton supports the upcoming state Zero Net Energy (ZNE) requirements for all new homes to achieve 100% net zero energy by 2020. Although no green building ordinances requiring ZNE are in place, the town encourages use of green building code to achieve higher building performance in new commercial buildings or major additions to commercial buildings; and promotes voluntary building code of zero net energy for new residential buildings. A voluntary commercial green building ordinance for new construction and major additions may be under consideration. The new Town of Atherton Civic Center is designed to be net energy positive.

E. Electric Vehicle Charging Infrastructure (EV)

The Town of Atherton has two public EV charging units located at Menlo College according to Plugshare.com. The recently adopted CAP recommends installation of electric car charging stations at Town facilities and providing plug-in areas, where feasible; and supports voluntary adoption of CALGreen codes, which require pre-wiring for electric vehicle supply equipment.

F. Summary and Recommendations for the Town of Atherton

Policies proposed in The Town of Atherton’s climate action plan strive to maintain a quality of life that is environmentally and economically sustainable. Because the Town of Atherton is currently focused on developing a sustainable, advanced energy model Civic Center that will be designed to be net energy positive, featuring best practices for renewables, energy efficiency, and EV charging infrastructure, we recommend that this remain the central focus. In the future, given that the Town of Atherton is almost entirely residential with little new construction, we recommend a focus on the best energy retrofit programs for homes as envisioned in the Town’s CAP.

IV. East Palo Alto

East Palo Alto is a city of more modest means than its neighbors. It cannot afford to be a progressive leader in renewable energy and technology, because the city struggles with providing the basic core needs.³⁰ However, East Palo Alto residents do have an “entrepreneurial spirit, strong environmental preservation principles, and a drive for innovative creation and natural resources protection.”³¹ The City adopted a Climate Action Plan (CAP) for East Palo Alto in 2011, with suggested policies and programs that aim to reduce emissions, save energy and money, and help East Palo Alto become a beautiful and healthy place to live, work, and play.³²

A. Local Renewable Energy

Similar to Atherton and all San Mateo county cities, East Palo Alto joined Peninsula Clean Energy (PCE) in 2016. PCE serves all residents and businesses with cleaner electricity that is 50 percent renewable and 75 percent carbon free at lower rates than Pacific Gas & Electric (PG&E), which is important in East Palo Alto.³³ The City would like its facilities to have solar, but does not own a lot of rooftops or parking lots for solar carports to make this feasible yet. East Palo Alto is interested in collaborating with PCE to make progress on clean energy.

³⁰ For example, one fifth of residents live below the poverty line and 40% of residents qualify for assistance on PG&E bills, according to Michelle Daher, City of East Palo Alto, personal communication, 7/25/16.

³¹ Introduction by Mayor Carlos Romero, East Palo Alto Climate Action Plan, December 2011, <http://www.ci.east-palo-alto.ca.us/documentcenter/view/748>

³² No formal policies are in place stemming from the CAP. In fact, a recent General Plan update softened language on climate over concern that the City wouldn’t be able to meet the goals.

³³ Golden, Mark. "East Palo Alto Moves to Cleaner, Cheaper Electricity after Stanford Students’ Analysis." <https://energy.stanford.edu>. N.p., 4 Feb. 2016. Web. 24 July 2016.

B. Energy Efficiency

East Palo Alto's energy consumption data includes both PG&E's energy sources and grid-tied solar installations.³⁴ On average, roughly two thirds of building GHG emissions from energy use in East Palo Alto is from gas consumption 63%, and electricity accounts for a little over one third 37%. Home energy use contributes roughly 42,000 metric tons of GHG in an average year.³⁵

Energy efficiency programs are important in East Palo Alto, where the income gap is exacerbated and the median household earned less than \$50,000, with monthly income after taxes of \$3,683. For the average East Palo Alto resident, energy expenditures of 17-23% can cost anywhere between \$625-850 of monthly earnings after taxes, a disproportionate financial burden each month.³⁶ Therefore a focus on energy efficiency programs for existing homes, both single family and multi-family, would be the most beneficial for this community.

C. Zero Net Energy Buildings

California has set targets for zero net energy new buildings, in which efficiency and on-site generation are combined to reduce residential buildings to zero net energy use by 2020 and commercial buildings by 2030.³⁷ Although East Palo Alto does not have specific ZNE policy in place or contemplated, it does have one promising ZNE project at the Romic Property, at 1990 Bay Road. Here the city is trying to do a zero net rebuild, working with Minnerva Ventures to rehabilitate the existing property. East Palo Alto will be working on special financing that will help shift the burden from property owners to future lessees, who will repay the loan through utility bills (not property tax).

D. EV Charging Infrastructure/ Transportation

The City of East Palo Alto does not currently have its own EV Charging policies. However, two chargers are available for public use at IKEA, and seven at the Four Seasons Hotel according to the Plug Share map. The City would like its fleet to be all electric, but no official policies are in place to do this.

³⁴ Sywulka, Benjamin, Todd R. Davies, Randy Saffold, and Roma Jhaveri. "Computers and Community in East Palo Alto: Report on the Survey Conducted Among East Palo Alto Residents Regarding Their Computer Usage and Community Involvement Prior to the Launch of the East Palo Alto Community Network." *SSRN Electronic Journal SSRN Journal* (n.d.): n. pag. [Http://smcenergywatch.com](http://smcenergywatch.com). San Mateo Energy Watch. Web. 24 July 2016.

⁴⁰ Rajput, Katyayani. "Net Positive East Palo Alto: How Low Income Energy Efficiency Can Help a Community - Sustainable Silicon Valley." *Sustainable Silicon Valley*. N.p., 26 Apr. 2016. Web. 24 July 2016.

⁴¹ Rajput, Katyayani. "Net Positive East Palo Alto: How Low Income Energy Efficiency Can Help a Community - Sustainable Silicon Valley." *Sustainable Silicon Valley*. N.p., 26 Apr. 2016. Web. 24 July 2016.

³⁷ Collyer, Breesa. "5 The Pacific Gas and Electric Company." *The Choices of Power Utilities Face the Environmental Challenge* (n.d.): n. pag. [Https://newbuildings.org](https://newbuildings.org). 19 Dec. 2012. Web. 24 July 2016.

E. Summary and Recommendations for East Palo Alto

Sustainability is important in East Palo Alto, a City that is significantly impacted by sea-level rise.³⁸ East Palo Alto is working with Cal-Fire to expand its tree canopy as both a flood protection and a GHG reduction measure.³⁹ Due to the significant income gap in East Palo Alto, we recommend that the City focus most on implementing residential deep energy retrofit programs to help reduce energy bills and energy use at the same time. Once these programs are underway, we recommend that the City select the best clean energy measures of the package of model ordinances under development that can further save money for residents and business, with the greatest emphasis on cost effective measures.

V. Menlo Park

In 2013, the City of Menlo Park adopted a climate goal for GHG reductions of 27% from 2005 levels by 2020.⁴⁰ The city has implemented a number of policies and programs to help achieve this goal, outlined below.⁴¹

A. Local Renewable Energy

Many cities see the development of local energy resources as key to creating sustainable business, advancing social equity, and promoting community resilience. To date, Menlo Park has accomplished the following:

- Menlo Park was an original member of the Regional Renewable Energy Procurement Project (now called Bay Area Sunshares), an effort led by Alameda County involving Menlo Park and 18 other public agencies to boost local renewable energy, this initiative utilized collaborative procurement to purchase renewable energy systems for public agencies throughout Alameda, Contra Costa, San Mateo and Santa Clara Counties.⁴²
- Menlo Park utilized Power Purchase Agreements (PPAs) to install solar panels on roofs and carports at city owned facilities, including its corporation yard, Arrillaga Gymnasium, Arrillaga Gymnastics Center, Onetta Harris Community Center, and the Belle Haven Child Care Center in 2015 to cover 80 percent of the energy needs of

³⁸ "City of East Palo Alto CITY COUNCIL MEETING AGENDA." [Http://www.ci.east-palo-alto.ca.us](http://www.ci.east-palo-alto.ca.us). N.p., 3 Sept. 2013. Web. 24 July 2016.

³⁹ "San Mateo County Climate Adaptation/Resilience Snapshot." Bayarearegionalcollaborative.org. N.p., Mar. 2014. Web. 23 July 2016.

⁴⁰ "Agenda Item I-3." MenloPark.org. City of Menlo Park, 20 Oct. 2015. Web. 18 June 2016.

⁴¹ <http://www.menlopark.org/305/Climate-Action-Plan>

⁴² Eslinger, Bonnie. "Menlo Park Poised to Get Solar Panels, Electric Vehicle Charging Stations." - *San Jose Mercury News*. Daily News, 22 Apr. 2014. Web. 16 June 2016.

those buildings.⁴³ Over a 20-year period, the panels are expected to save about \$461,000 in energy costs and reduce GHG emissions by 419 tons.⁴⁴

- New zoning regulations were adopted in December 2016 that require all new construction to meet 100% of energy demand (electricity and natural gas) through renewable sources including on-site generation, and any combination of the following measures:⁴⁵
 - Purchase of 100% renewable electricity through PCE or PG&E in an amount equal to the annual energy demand of the project;
 - Purchase and installation of local renewable energy generation within the City of Menlo Park in an amount equal to the annual energy demand of the project; or;
 - Purchase of certified renewable energy credits annual in an amount equal to the annual energy demand of the project.
- The new zoning also requires on-site energy generation of 30% of the maximum extent feasible as determined by an On-Site Renewable Energy Feasibility Study, which is required to demonstrate the following cases: 1. Maximum on-site generation potential, 2. Solar feasibility for roof and parking areas (excluding roof mounted HVAC equipment), and 3. Maximum solar generation potential solely on the roof area.
- Similar to Atherton, Menlo Park has opted for PCE's ECO100 option (100% renewable energy) for its city energy use.

B. Energy Efficiency

The City of Menlo Park also supports energy efficiency programs as part of its Climate Action Plan. The City has made numerous improvements to its facilities to save an additional 150 tons of GHG including the following:⁴⁶

- Variable frequency drive pump systems were installed at the Burgess Park and Belle Haven Park pools.
- The City purchased a new Energy Monitoring System for its facilities.
- New chillers and variable frequency drives have been installed.

In addition, the new zoning regulations require new developments to enroll in EPA's Energy Star Building Portfolio Manager to benchmark and monitor building energy performance.

⁴³ Eslinger, Bonnie. "Menlo Park Poised to Get Solar Panels, Electric Vehicle Charging Stations." - *San Jose Mercury News*. Daily News, 22 Apr. 2014. Web. 16 June 2016.

⁴⁴ Bradshaw, Kate. "Today: Menlo Park Celebrates Solar Power Installations." | *Almanac Online* |. The Almanac, 28 Apr. 2016. Web. 20 June 2016.

⁴⁵ <http://www.menlopark.org/1148/Approved-documents>

⁴⁶ <http://www.menlopark.org/305/Climate-Action-Plan>

<http://www.menlopark.org/ArchiveCenter/ViewFile/Item/4299>

C. Zero Net Energy Buildings

The Environmental Quality Commission has been advising Menlo Park on the development of sustainable building policies, minimum green building standards for new construction and renovation of residential and non-residential structures. Green building policies encourage energy efficiency, water efficiency, water use reduction, material conservation, resource efficiency, indoor air quality and environmental quality.⁴⁷ Menlo Park's new zoning regulations are essentially a stepping stone to the upcoming state ZNE policy, with a zero carbon building approach, including the above discussed renewable energy and efficiency policy, as well as the following sustainable building requirements that have taken effect in 2017:

- Buildings must be LEED Silver for 10,000 to 100,000 square feet, and LEED Gold for over 100,000 square feet. LEED standards will also apply to major renovations.⁴⁸
- After construction, the city of Menlo Park will receive reports on energy use, and if users exceed certain limits they will be required to offset the excess through energy efficiency, reduced consumption, increase energy production, or, paying a fee.

D. EV Charging Infrastructure

Menlo Park has one of the highest rates of new electric car purchases in the nation at 14%.⁴⁹ The city opened four of new EV charging stations to the public in June 2016.⁵⁰ Dozens of EV Charging Stations are also open to the public for use through business and hotels. The new city zoning regulations require new commercial and multi-family buildings to have 5% of parking spaces pre-wired for EV chargers, and 1% of new parking plus 2 additional spaces to have EV chargers installed.

E. Summary and Recommendations for Menlo Park

Menlo Park is projected to grow from 12,432 households in 2010 to over 17,000 households in 2035, with most of the new growth planned for the Belle Haven, Bayfront, and downtown corridor including El Camino Real.⁵¹ The recently updated General Plan and zoning regulations contain many new policies to create a more resilient community

⁴⁷ "Environmental Programs | City of Menlo Park - Official Website." *Environmental Programs | City of Menlo Park - Official Website*. City of Menlo Park, n.d. Web. 13 June 2016.

⁴⁸ Bradshaw, Kate. "Menlo Park Plans Strict Rules on Energy, Water Use for New Development." *Almanac Online* | The Almanac, 20 Jan. 2016. Web. 16 June 2016. Note that this applies to the "M2" area east of the 101, where most development over the next few decades is slated to occur. A separate downtown area specific plan requires new downtown develops (along El Camino Real and Santa Cruz Ave) to meet LEED Silver certification.

⁴⁹ ICCT, Sept 2016 <http://www.theicct.org/ev-markets-calif-cities-sept2016>

⁵⁰ The project was funded by a grant covering the cost of installing charging stations up to \$4,500 per station This requires annual matching of \$4,480 from the City to be applied toward network service fee, software upgrades, programming and 24/7 driver support. <http://www.menlopark.org/calendar.aspx?eid=2368>

⁵¹ "Sustainable Community Strategy: Initial Vision." *MenloPark.org*. City of Menlo Park, n.d. Web. 6 June 2014.

including water conservation and elevation requirements for new buildings in future flood plains impacted by sea level rise. As the standards for new developments now require many advanced energy measures, it will be important for Menlo Park to focus on retrofitting existing homes and businesses to be more sustainable.

VI. Redwood City

Redwood City prepared and adopted a Community Climate Action Plan (CCAP) in 2013 outlining a number of programs and strategies to reduce GHGs. The CCAP included an inventory of GHGs generated in Redwood City by transportation, housing, commercial, industrial activities and waste processing, using the ICLEI protocol.⁵² In the baseline year, 2005, transportation, housing, commercial, industrial activities and waste processing emitted 670,000 metric tons of CO₂e.⁵³ Over 45% of GHG emissions in Redwood City come from energy used by homes and businesses.

A. Local Renewable Energy

Redwood City has been recognized by the SolSmart program, a U.S. Department of Energy SunShot Initiative, as a leader in advancing solar energy.⁵⁴ The City was awarded first a Bronze, then a Gold designation in 2016 for streamlining the solar permitting and inspection process, updating solar codes, providing PACE financing options, and supporting Bay Area Sunshares, our solar group purchase program.⁵⁵ The PACE financing program helps residents cover the upfront costs of home energy projects and installing solar. Through a partnership between HERO home renovation contracting service and Redwood City, residents can set payment plans from 5 to 20-years and pay off projects with money saved by using less energy. Making energy efficient upgrades is more affordable with HERO financing as it offers low-interest alternatives which may be repaid through property taxes.⁵⁶

B. Energy Efficiency

Redwood City helps residents and businesses access a number of energy efficiency programs, including Energy Upgrade California, San Mateo Country Energy Watch programs, PG&E rebates and incentives, and PACE financing for energy efficiency and water conservation projects, EV charging, solar installations, and even seismic upgrades.

⁵² "4.6 Greenhouse Gas Emissions and Energy." *www.Redwoodcity.org*. N.p., Oct. 2015. Web. 11 July 2016.

⁵³ "4.6 Greenhouse Gas Emissions and Energy." *www.Redwoodcity.org*. N.p., Oct. 2015. Web. 11 July 2016.

⁵⁴ <http://www.gosparc.org/>

<http://energy.gov/eere/sunshot/sunshot-initiative>

<http://www.redwoodcity.org/departments/public-works/environmental-initiatives/energy-initiatives>

⁵⁵ <http://www.redwoodcity.org/departments/community-development-department/apply-for-a-permit-status-of-applications>

<http://www.bayareasunshares.org/>

⁵⁶ "Residents, Redwood City California." *Redwood City California*. Verde Redwood City, n.d. Web. 3 July 2016.

Redwood City Step Up and Power Down, a partnership between Redwood City and PG&E promotes events, offers workshops and provides resources to make it easy and rewarding for residents to reduce unnecessary energy use.⁵⁷ *Step Up and Power Down* offers help with energy saving measures such as winterizing windows, timed use of outdoor lights, smart power strips, and tips to wash clothes with cold water. More than 1,000 households took part in this campaign to reduce energy waste, through pledges that participants made to save energy.

C. Zero Net Energy Buildings

Redwood City has staff attending San Mateo County Energy Watch (SMCEW) ZNE policy development events and meetings. City staff have played a helpful role contributing to this county-wide work.

D. EV Charging Infrastructure

Redwood City provides EV charging stations for public use at a number of local facilities including the Jefferson and Marshall Street Garages, the Main Library and Redwood Shores Library as well as the Red Morton Community Center.⁵⁸ Roughly half of the more than twenty public EV Chargers are free.⁵⁹ Redwood City assumed the \$39,000 cost for installation, electricity, station maintenance and an ongoing vendor fee to be included in Charge Point's user network. To date, those costs have added up to \$79,000, with more than 15,000 hours of vehicles plugged into the EV stations, increasing every year.⁶⁰ Redwood City is evaluating these policies.⁶¹

Redwood City recently partnered with Green Charge Networks to bundle energy storage and EV charging.⁶² Installed in 2014, Redwood City has five EV charging station locations combined with energy storage including two DC Fast Charging stations, installed at the Redwood Shores library and at the City's downtown parking garage. Green Charge Networks' intelligent energy storage can shave multiple peaks per day caused by the EV charging stations. The energy storage is expected to save nearly \$7,000 annually in demand charges at the five Redwood City locations alone. The Redwood City energy storage equipment and installation came at no cost to the city, due to a shared savings

⁵⁷ <https://redwoodcity.stepupandpowerdown.com/about/>

⁵⁸ "Smart Builders." *Energy Saving Home Improvements for Redwood City Home Owners*. N.p., n.d. Web. 2 July 2016.

⁵⁹ Eslinger, Bonnie. "Electric Car Drivers May Start Paying to Charge up at Redwood City Stations." *www.mercurynew.com*. Daily News, 3 Sept. 2014. Web. 10 July 2016.

⁶⁰ Eslinger, Bonnie. "Electric Car Drivers May Start Paying to Charge up at Redwood City Stations." *www.mercurynew.com*. Daily News, 3 Sept. 2014. Web. 10 July 2016.

⁶¹ Eslinger, Bonnie. "Electric Car Drivers May Start Paying to Charge up at Redwood City Stations." *www.mercurynew.com*. Daily News, 3 Sept. 2014. Web. 10 July 2016. Redwood City is contemplating a fee of \$1.50 per hour to use existing charging stations and \$4.50 to \$5 per hour to use Fast-Charging stations.

⁶² <http://www.greencharge.net/green-charge-networks-and-chargepoint-partner-to-combine-intelligent-energy-storage-and-ev-charging/>; http://greencharge.net/wp-content/uploads/2016/07/CS_RedwoodCity_1026_D.pdf

agreement on avoided demand charges. Green Charge Networks has other projects that also bundle solar installations with the energy storage and/or EV charging.

E. Summary and Recommendations for Redwood City

Redwood City's environmental programs and Climate Action Plan process are designed to improve sustainability and reduce citywide greenhouse gas emissions, by addressing the major emissions sources of energy, transportation, water, and waste. Redwood City has shown energy innovation through the EV chargers coupled with energy storage, which can serve as a model policy to other communities. Due to the substantial growth in new buildings, Redwood City should focus on ZNE and more sustainable building energy standards reaching ahead of state code requirements.

VII. Conclusion and Findings

The four aforementioned cities discussed above along with the County of San Mateo have clearly made great advances supporting clean energy beyond what is required in California. Each have made a signature advance that serves as a model and each can utilize models from other cities to advance towards the ideal Advanced Energy Community (AEC).

San Mateo County has made tremendous progress supporting renewable energy through PCE, which enables each city to access cost-competitive renewable energy. PCE also creates the local government infrastructure to support, deploy or enable advanced energy measures in each city (*this is discussed in detail in the PAEC Task 2.1 Best Practices report*). San Mateo County also provides significant leadership to the cities through RICAPS, SMCEW, and its Office of Sustainability.

The Town of Atherton provides an excellent example of what an AEC can look like through its future net energy positive Civic Center sustainability features construction project, which will serve as an excellent model for similar developments in other San Mateo County cities. Atherton would benefit most from a focus on energy efficiency retrofits and electrification of existing homes through voluntary assistance programs and mandatory upgrades at the point of sale or during major renovations. East Palo Alto, Menlo Park, Redwood City, and unincorporated San Mateo County would similarly benefit from these types of efficiency and electrification programs for existing buildings including businesses in addition to homes.

East Palo Alto's ZNE project at the Romic Property could become an excellent model of public-private partnerships to support businesses going ZNE. Menlo Park's new green zoning requirements for 100% renewable energy, on-site renewable feasibility studies and development, and building energy monitoring through EPA's Energy Star program serves as a fine example for cities that are updating planning and zoning regulations and expect significant new development. Redwood City's use of a third party to install EV charging



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stations coupled with energy storage to save the city money serves as an excellent example of a cost-effective route to community resilience and support for EVs.

San Mateo County and the cities discussed in this document are already well on their way to becoming model AECs. Through effective collaborations, and with the County of San Mateo taking a leadership role, the PAEC initiative will streamline policies and showcase projects that facilitate local renewables and other advanced energy solutions like energy efficiency, energy storage, and electric vehicle charging infrastructure. The PAEC will create pathways to cost-effective clean local energy and community resilience throughout San Mateo County and the City of Palo Alto; and beyond.