DATE: November 5, 2019

AGENDA ITEM #3

TO: Environmental Commission

FROM: Callie Niday, Staff Liaison

SUBJECT: Silicon Valley Clean Energy Authority (SVCEA) 2019 Building Electrification and Electric Vehicle Infrastructure Reach Code Initiative

RECOMMENDATION:

Discuss proposed electrification Reach Codes for 2019 Energy Code and make a recommendation to City Council

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BACKGROUND

Silicon Valley Clean Energy (SVCE), along with Peninsula Clean Energy (PCE) and the San Mateo County Office of Sustainability, are supporting their municipalities to adopt building codes that will result in safer and more comfortable buildings, increase their electric vehicle charging infrastructure, and reduce their carbon footprint.

In support of municipalities and counties in SVCE and PCE service territory, SVCE and PCE are providing extensive technical assistance plus a $10,000 incentive to each city that brings reach codes to their councils.

Reach Code Adoption Process

Every three years, the State of California adopts new building standards that are organized in Title 24 of the California Code of Regulations, referred to as the California Building Standards Code. This regular update is referred to as a "code cycle." The last code cycle was adopted in 2016 and was effective as of live on January 1, 2017. The next code cycle will be adopted in 2019 and will be effective January 1, 2020. Cities and counties can adopt reach codes that require items that are above and minimum state code requirements. However, these reach codes must be filed with the State.

In addition, the California Energy Commission (CEC) requires that a cost-effectiveness study be conducted and filed in the case of local amendments to the Energy Code (Title 24, Part 6). It is required that the City demonstrate to the CEC, using a cost-effectiveness study, that the amendments to the code are financially responsible and do not represent an unreasonable burden to the non-residential and residential applicants. A cost-effectiveness study is not required for amendments to the Green Building Code (Title 24, Part 11).

Statewide Cost-Effectiveness Study for Energy Code Reach Codes

Funded by the California investor-owned utilities, the California Statewide Codes and Standards Program (Statewide Program) led the development of a cost-effectiveness study for Energy Code reach codes that examined different performance-based approaches for new construction of specific

building types. There are two kinds of reach code approaches: performance-based ordinances and prescriptive ordinances. Performance-based ordinances mandate an increase in the overall energy efficiency required but leave flexibility for the builder on how to achieve this goal. In contrast, prescriptive ordinances mandate implementation of a specific measure (such as solar panels or cool roofs). The Statewide Program's analysis focused on performance-based ordinances but some conclusions about prescriptive measures can be made from the results.

Prescriptive Codes: Require one or more specific energy efficiency measures.
Performance Codes: Require a building to perform more efficiently based on accepted computer modeling and allow trade-offs between energy efficiency measures.

Why Establish Reach Codes?
The benefits of greenhouse gas (GHG) free electricity can best be realized by electrification of new and existing buildings and transportation vehicles. Electrifying buildings and vehicles transition them away from the use of natural gas and gasoline to clean energy provided by SVCE. By developing electrification reach codes, cities can save energy and reduce GHG emissions in Santa Clara and San Mateo County. All-electric buildings are safer and healthier to live in along with being cost effective, especially when adopted at the new construction stage. It is most efficient for cities to coordinate adoption of reach codes with the adoption of the new 2019 building code, taking effect January 1, 2020.

Electric Vehicle Charging Infrastructure
Electric Vehicle (EV) charging requirements in California can generally be broken into three categories:

1. EV Charging Installed: all supply equipment is installed at a parking space, such that an EV can charge without additional equipment.
2. EV Ready: Parking space is provided with all power supply and associated outlet, such that a charging station can be plugged in and a vehicle can charge.
3. EV Capable: Conduit is installed to parking space, and building electrical system has ample capacity to serve future load. An electrician would be required to complete the circuit before charging is possible.

EV charging capacity and speed can be summarized as three categories:

1. Level 1: Capable of charging at 120V, 20A. This is a equivalent to a standard home outlet.
2. Level 2: Capable of charging at 240V, 30-40A. This is the service capacity typically used for larger appliance loads in homes
3. Level 3 (DC Fast Charging): Capable of charging at 20-400kW. This is the type of charger used for Tesla Superchargers and DC Fast Chargers at some supermarkets.

The 2019 California Green Building Code Update (Title 24, Part 11) increases requirements for electric vehicle charging infrastructure in new construction; including:

1. New one- and two-family dwellings and townhouses with attached private garages: must be Level 2 EV-capable
2. Multi-family dwellings: 10% of parking spaces must be Level 2 EV-capable
3. Non-residential: 6% of parking spaces must be Level 2 EV-capable

Building Appliance Electrification

For multiple reasons including health, safety economics and environmental benefits, there is considerable interest in mandating all-electric new construction, or "building electrification," which means that the buildings would not have any fossil fuel services. All-electric buildings have electric appliances for space heating, water heating, clothes-drying, and cooking. The interest in building electrification stems from the fact that SVCE is providing 100% carbon-free electricity and eliminating the use of natural gas can greatly reduce greenhouse gas emissions from the building sector. To date, the City does not often see all-electric buildings constructed. Mandating that all new construction be all-electric through the building reach code process has not been chosen as the appropriate path because of legal implications in proving cost-effectiveness of this approach to the CEC. The leading approach is to encourage electrification by giving builders the choice of two options:

1. achieving a higher energy efficiency level than the Energy Code using mixed fuels (natural gas and electricity); or
2. building an all-electric building at the minimum efficiency as required in the Energy Code. The Statewide Program's study analyzed this approach.

Electric Vehicle Charging Infrastructure

Local residents are showing a significant interest in electric vehicles. For example, the number of registered plug-in vehicles in Santa Clara county increased by 31% in 2018. By comparison, registrations for vehicles powered by fossil fuels shrank in 2018. It is widely known that availability of EV charging infrastructure is a critical component to EV adoption. Meanwhile, it is significantly more expensive to install charging infrastructure as a retrofit than it is during new construction. As such, ensuring that newly constructed residential and non-residential parking has ample EV charging capability will reduce long-term costs of EV infrastructure installation, while helping to increase EV adoption and decrease transportation-related greenhouse gas emissions. While California's new minimum requirements are a step forward, it is unlikely that the requirements for multi-family dwellings and non-residential buildings are enough to keep pace with expected EV growth looking towards 2030. The Statewide Program's team reviewed approaches to increase the amount of EV infrastructure in new construction buildings, while keeping construction costs as low as possible.

For more information on the Reach Code initiative, please visit:
https://www.svcleanenergy.org/reach-codes/

DISCUSSION

Staff attends monthly Member Agency Working Group (MAWG) meetings with SVCEA. The monthly updates can be found below.

SVCEA MAWG Updates (January 2019 – August 2019):

The MAWG did not meet in December 2018. City staff attended the SVCE County-wide Reach Code Working Group Launch on January 15, 2019 to learn more about the Reach Code project described above. Members of the City Manager's Office and Community Development Department attended as well.

At the January 24, 2019 MAWG meeting, the group discussed the potential for SVCEA to form a joint funding mechanism with BAAQMD and other agencies to fund EV infrastructure. SVCEA staff is currently developing an RFP and scope of work to secure a consultant to explore the EVSE market

and identify barriers, forecast infrastructure needs, and establish a mechanism to pursue grant funding. SVCEA also updated the group on youth focused programs like the Bike to the Future event, which took place in April 2019 and the creation of a student ambassador program, focused on educating students and schools about ways to reduce GHG emissions.

On March 20, 2019, SVCEA hosted a workshop on the Reach Code project to the appropriate City Staff, the Building/Developer Community and interested stakeholders. The Reach Code project is currently underway, the consultant completed the cost effectiveness study, and the initial draft of the reach codes was released in March.

At the April 25, 2019 MAWG meeting, the group discussed the release of the new PG&E rates for 2019. Sunnyvale gave a presentation on their Climate Action Playbook. The group received an update from Aimee Bailey, Director of Decarbonization and Grid Innovation, on SVCE Innovation Onramp which went live April 3, 2019. The Heat Pump Technology Days: Water Heating Meeting was held on May 9, 2019 in San Francisco. SVCEA also informed the group that the results of the cost effectiveness study for the Reach Codes project are available. SVCE is looking for input from cities and stakeholders; May 15, 2019 is the deadline to provide input before the reach code language is drafted. In May 2019, SVCEA launched a showcase design grant focused on all-electric projects within the service territory; the new all-electric Los Altos Community Center may be eligible. Also, the group announced that PG&E has delivered gas data for the Climate Action Plan.

At the May 23, 2019 MAWG meeting, SVCE presented the heat pump water heater program, which launched in June 2019. This program is offering funding for 100 residential projects including incentives for new heat pump water heaters and new solar panels. The group received an update on the showcase of all-electric design awards, which also launched in June 2019. The awards are going to be available for all-electric buildings that are already built, rather than future projects. The goal is to showcase the participating projects in SVCE's resource center. SVCE also gave an update on the jurisdictions that have sent in a letter of intent for the reach codes – including Cupertino, Milpitas, Morgan Hill, Mountain View, Campbell, Los Altos, and Sunnyvale. On May 29, 2019, the building model reach code language was shared and on June 6, 2019, the electric vehicle model reach code was discussed.

At the June 27, 2019 MAWG meeting, the group discussed the reach codes initiative with the building officials from various jurisdictions. The building officials from the City of Sunnyvale, City of Milpitas, and the City of Cupertino attended this meeting. As previously discussed, the overall goal of adopting a reach code is to increase the electrification of buildings and decrease buildings overall carbon emissions. Additional benefits of constructing a home that is all-electric is that they are the healthier, cleaner, safer, and more cost-effective option than building a home that has mixed-fuel (electricity and natural gas). Three pathways were presented at the meeting, including: pathway 1 (all-electric), pathway 2 (mixed fuel), and pathway 3 (mixed-fuel with no space and water heating). Pathway 3 would cut the carbon emissions by 80% and would still offer people the option to have comfort appliances (i.e. gas stove top and gas fire pit). In addition, the group received an update that the all-electric showcase awards are now live; applications will be accepted until July 26, 2019. SVCE will showcase the customers who have successfully constructed an all-electric home and will showcase the design elements to help support the reach code effort. The FutureFit Heat Pump Water Heater program launched on June 28, 2019 and about 115 people have already shown their interest. The Heat Pump Cost Effectiveness webinar was given on July 3, 2019.

At the July 25, 2019 MAWG meeting, Aimee Bailey introduced a new program focused on grid integration called the Virtual Power Plant (VPP) initiative. To better understand VPP functions and values, SVCE and Gridworks are releasing the Silicon Valley Clean Energy Virtual Power Plant Options Analysis Discussion Draft to generate thoughts, ideas, and feedback on possible solutions and the path to achieving those solutions in Silicon Valley. Other programs discussed at the MAWG meeting include the Innovation Onramp Program, the All-Electric Showcase Awards, and FutureFit – the heat pump water heater program. The Heat Pump Water Heater Buyers Guide can be found in Attachment A. It was announced that the City of Berkeley unanimously voted to ban natural gas for new low-rise residential buildings starting January 1, 2020. PG&E has offered to attend council meetings in support of building electrification. There is a Building Decarb Coalition webinar on August 29, 2019 called "Is a Gas Moratorium Right for You?" In addition, SVCE announced that there are existing tools on their website to help support the reach code effort, including the Model Staff Report Letter Template and informational flyers (found in Attachment B). Additional tools are currently under development, including a general slide deck for City staff use, building department checklists, a cost effectiveness informational chart, an electric vehicle cost effectiveness analysis, and an informational video. An update was given to the group that the 2018 GHG inventory is almost completed. Lastly, the Draft EV Infrastructure Joint Action Plan was discussed.

At the August 22, 2019 MAWG meeting, Don Eckert, the Director of Finance of SVCE, gave a presentation on the proposed 2019-2020 operating budget. A status update of the following programs was given: all-electric showcase awards, heat pumps, reach codes, and VPP. In addition, an announcement was made about the California Electric Vehicle Infrastructure Project (CALeVIP): SVCE formed a regional coalition with other Community Choice Aggregations and municipal utilities to try to interest the CEC in partnering on a CALeVIP program in our area. The CEC announced earlier this month that they have chosen SVCE for a CALeVIP launch in 2020, with a combined funding of $60 million! As SVCE's territory will have $12 million dedicated to it (with half coming from the CEC and half from SVCE), this program will lead to substantially more charging infrastructure installed throughout SVCE territory.

At the September 26, 2019 meeting, the group introduced the new SVCE staff members and announced the new open positions. The group discussed a status update on the current SVCE programs. A presentation on the Climate Youth Ambassador Program was given which focuses on bringing environmental awareness to elementary, middle, and high school students. To date, the group has engaged in 11 community outreach events and have talked to over 600 kids. The group intends to expand the climate youth ambassador team so they can continue to spread awareness of the climate crisis.

At the October 24, 2019 meeting, an announcement was made regarding the Energy Atlas tool for local governments. The group discussed the SVCE program updates including: reach codes, FutureFit heat pump water heater program, EV priority zones for DC fast charging, VPP, EBCE resiliency RFP, and the customer resource center. In addition, Don Bray lead a discussion on local regulatory opportunities.

Attachments:
A. Draft Reach Code Presentation
B. Draft Reach Code Agenda Report

Good Evening Council Members,

I am Laura Teksler, member of the Environmental Commission and chair of its Green Building subcommittee and I'm here with Don Weiden, Chair of the Commission. The Environmental Commission is pleased tonight to present our recommendation for Building and Electric Vehicle Reach Codes. I will begin our presentation tonight by providing some background on the Commission's work on Green Building, then John Supp from Silicon Valley Clean Energy will provide an overview of reach codes and I will finish with the Commission's recommendations.

The Commission first began working on Green Building recommendations more than two years ago, producing our Green Building subcommittee report in June 2017. In that report two of our primary recommendations were to encourage 100% Electric Buildings, as well as electric vehicle charging infrastructure. Our subcommittee focused on these items because they had the most potential for carbon reduction in our city. The subcommittee then began to work with City staff to try to identify appropriate incentives to encourage these voluntary green building measures. Additionally, City staff shared the Commission's report with the Member Agency Working Group (MAWG) of Silicon Valley Clean Energy. In 2018 that working group identified Reach Codes as one of the top ranked priorities for SVCE to pursue and they began to develop model building and electric vehicle codes for cities to adopt in conjunction with the new 2019 building code.

I'd now like to introduce John Supp, Account Services Manager at SVCE who will talk about reach codes and the process used to develop them.

John's Presentation

As Mr. Supp detailed, the SVCE / PCE developed Building Reach Codes offer municipalities implementation options; providing codes that allow for exclusively all-electric building, both mixed fuel and all-electric buildings, or electrically heated mixed fuel buildings. After careful evaluation, the Environmental Commission recommends that Los Altos adopt the all-electric and electrically heated mixed fuel building pathways for both residential and commercial buildings. Additionally, the Commission recommends the adoption of the Electric Vehicle Infrastructure Reach Codes. The Environmental Commission recommends the Council introduce and waive further reading of these codes.

This table details the proposed codes.

Proposed Reach Code
All New Buildings

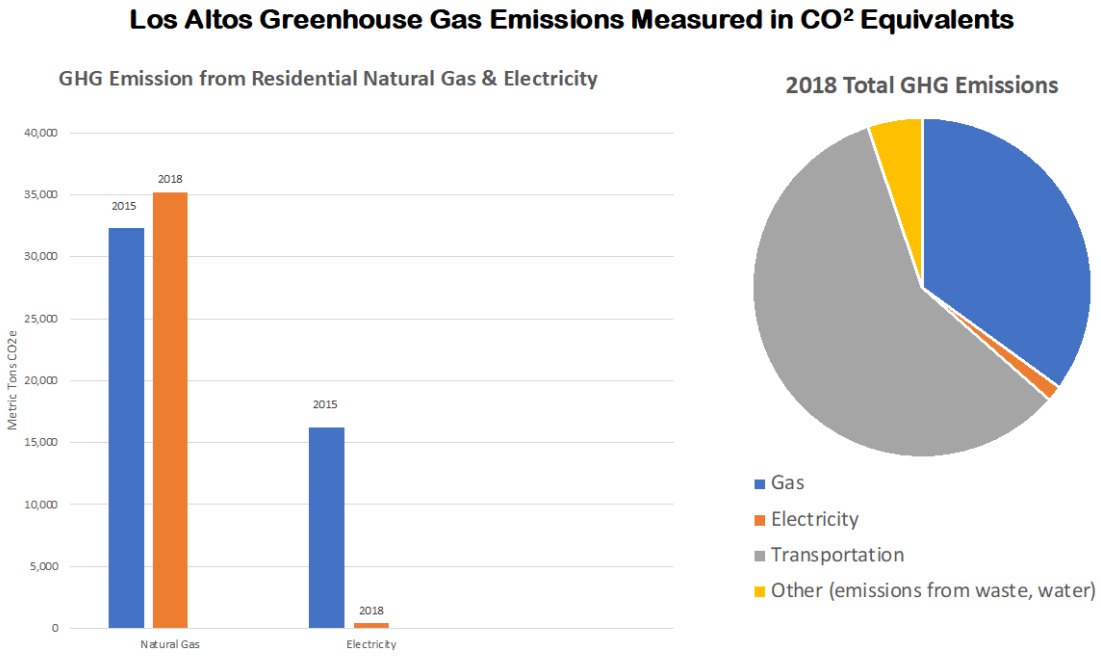
1. **Require electric fuel source for space heating, water heading and clothes drying**
2. **Natural gas can be used for cooking stoves, fireplaces and other "comfort" appliances. Prewiring for electric appliances required where natural gas appliances are used. Mixed-fuel buildings must have a higher efficiency rating**

Proposed EV Infrastructure Reach Code

	Level 2 EV Installed	Plug & Play Level 2 EV Circuit	Capable Level 2 EV Circuit	Plug & Play Level 1 EV Circuit
Single Family		1	1 (if >1 parking space)	
Multi- family < 20		1 per unit		
Multi- family >20			25%	75%
Non-Residential	10%		30%	10%
Non-Residential, Non-office	6%			5%

Fuel switching from natural gas to electricity offers Los Altos an opportunity for significant GHG emission reductions. In 2018 residential gas use in Los Altos accounted for over 35,000 metric tons of CO2 equivalent and the trend is that emissions from this sector are on the rise. From 2015 to 2018 natural gas emissions increased approximately 3,000 MT whereas electricity emissions dropped dramatically during that time period (from over 16,000 Metric tons to 436 MT) thanks mostly to the carbon-free electricity provided by SVCE. Carbon emissions from non-residential gas and electric use have followed the same trends. Ensuring that future buildings are fully, or nearly, 100% electric provides the City with an opportunity to reduce emissions immediately and over the lifetime of those buildings. Buildings that continue to use natural gas for cooking and comfort devices, such as fireplaces, will need to perform at a higher efficiency standard. Note the Reach Codes apply to the interior of the building, so gas can continue to be used outside the home. Electric buildings are cheaper to build and operate.

Emissions from Vehicle Miles Traveled represent the largest single contributor to Los Altos' GHG emissions. Despite increased miles traveled, these emissions have declined slightly over the three-year period, from over 78,000 MT to 71,500 MT, thanks to the increase in electric and low-emission vehicles. The potential GHG reduction Los Altos could realize through building and EV reach codes is substantial and will help the City address the largest remaining sources of carbon emissions.



Our neighboring communities are also in the process of adopting reach codes and here is a current look at what other communities are considering. As shown in the table, our proposal is similar to what Mountain View and Los Altos Hills are evaluating, as well as what Menlo Park and San Jose have approved.

That concludes the Commission's presentation and we are happy to answer any questions.

Reach Code Update

Mountain View Oct 22, 5-0
Morgan Hill Oct 23, 4-1

City	Status	**Encourage** Gas Reduction: High Reach + Electric Heat	**Encourage** Gas Reduction: High Reach Only	**Require** Gas Reduction: Limited Gas Usage	**Require** Gas Reduction: Ban Natural Gas
Mountain View	1st Reading			→	X
Morgan Hill	1st Reading				X
Los Altos	Evaluating			X	
Los Altos Hills	Evaluating			X	
Saratoga	Evaluating	→	→	X	
Cupertino	Evaluating		→	X	
Sunnyvale	Briefing		X		
Campbell	Evaluating	X			
Gilroy	Evaluating	X			
Milpitas	Evaluating	X			
Los Gatos	Briefing	X			
County of Santa Clara	Briefing	X			
Monte Sereno	Evaluating	X ←			

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_____ **CALENDAR**

Agenda Item # ___

AGENDA REPORT SUMMARY

Meeting Date: November 12, 2019

Subject: Building Electrification and Electric Vehicle Infrastructure Reach Codes – Proposed Reach Codes for 2019 Energy Code

Prepared by: Environmental Commission
Reviewed by: Jon Biggs, Community Development Director
Approved by: Chris Jordan, City Manager

Attachment:
Ordinance No. 2019-466

Initiated by:
Environmental Commission

Previous Council Consideration:
None

Fiscal Impact:
None anticipated

Environmental Review:
The proposed Ordinance relates to organizational or administrative activities of governments that will not result in direct or indirect physical changes in the environment, and therefore is not a project within the meaning of the California Environmental Quality Act ("CEQA") and the State CEQA Guidelines, sections 15378(b)(5). Alternately, this ordinance is exempt from CEQA pursuant to State CEQA Guidelines, section 15061(b)(3), "the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment" as the Ordinance has no potential to result in a direct, or reasonably foreseeable, indirect impact on the environment.

Policy Question(s) for Council Consideration:
Does the Council wish to adopt Building Electrification and Electric Vehicle Infrastructure Codes containing requirements that limits power sources to principally electric appliances and fixtures?

Summary:
Every three years, the State of California adopts new building standards that are organized in Title 24 of the California Code of Regulations, referred to as the California Building Standards Code. The code must be adopted in 2019 and will be effective January 1, 2020. Cities and counties can adopt

Reviewed By:

City Manager	City Attorney	Finance Director
CJ	CD	SE

amendments to building codes that have requirements that exceed minimum building code requirements. Reach codes provide requirements that exceed the standards for the electrical code and require the installation of electric vehicle infrastructure in new construction.

Recommendation:
The Environmental Commission recommends the City Council adopt building electrification and electric vehicle reach codes, which amend the California Building Standards Code that, if adopted, become effective on January 1, 2020; to help reduce carbon emissions associated with new construction, reduce costs in new construction, improve indoor air quality and safety of our building stock, support affordable housing, and increase adoption of electric vehicles.

Purpose
The ordinance will put into effect requirements that mandate the use of certain electrical appliances and fixtures and the installation electric vehicle infrastructure for new construction.

Background
The City of Los Altos demonstrated leadership in sustainability when the City adopted a Climate Action Plan in December of 2013 and joined the Silicon Valley Clean Energy joint powers authority in March of 2016.

In alignment with the above, the Environmental Commission recommends modifying Part 6 and Part 11 of the California Building Code. This report provides an overview of the Statewide cost-effectiveness study, details findings, and provides language recommended for the associated reach code for the 2019 building cycle.

Reach Code Adoption Process
Every three years, the State of California adopts new building standards that are organized in Title 24 of the California Code of Regulations, referred to as the California Building Standards Code. This regular update is referred to as a "code cycle." The last code cycle was adopted in 2016 and was effective on January 1, 2017. The next code cycle will be adopted in 2019 and will be effective January 1, 2020. Cities and counties can adopt reach codes that require items that are above and minimum state code requirements. However, these reach codes must be filed with the State if adopted by a local agency.

In addition, the California Energy Commission (CEC) requires that a cost-effectiveness study be conducted and filed in the case of local amendments to the Energy Code (Title 24, Part 6). It is required that the City demonstrate to the CEC, using a cost-effectiveness study, that the amendments to the code are financially responsible and do not represent an unreasonable burden to the non-residential and residential applicants. A cost-effectiveness study is not required for amendments to the Green Building Code (Title 24, Part 11).

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Statewide Cost-Effectiveness Study for Energy Code Reach Codes

Funded by the California investor-owned utilities (IOUs), the California Statewide Codes and Standards Program (Statewide Program) led the development of a cost-effectiveness study for Energy Code reach codes that examined different performance-based approaches for new construction of specific building types. There are two kinds of reach code approaches: performance-based ordinances and prescriptive ordinances. Performance-based ordinances mandate an increase in the overall energy efficiency required but leave flexibility for the builder on how to achieve this goal. In contrast, prescriptive ordinances mandate implementation of a specific measure (such as solar panels or cool roofs). The Statewide Program's analysis focused on performance-based ordinances but some conclusions about prescriptive measures can be made from the results.

Building Prototypes

The Statewide Program's analysis estimated cost-effectiveness of several building prototypes including one-story and two-story single-family homes, a two-story multifamily building, a three-story office building, a one-story retail building, and a four-story hotel. The single-family homes, multi-family buildings, and office building prototypes are directly applicable to development in Los Altos. The City has averaged approximately 40 new single-family homes constructed each year over the past five years. Additionally, many approved development projects include mixed-use developments or multi-family developments.

Electric Vehicle Charging Infrastructure

Electric Vehicle (EV) charging requirements in California can generally be broken into three categories:

1. EV Charging Installed: all supply equipment is installed at a parking space, such that an EV can charge without additional equipment.
2. EV Ready: Parking space is provided with all power supply and associated outlet, such that a charging station can be plugged in and therefore ready to charge a vehicle.
3. EV Capable: Conduit is installed adjacent to a parking space area, and the building electrical system has ample capacity to serve future energy loads. An electrician would be required to install the conductor and associate outlets before charging is possible.

EV charging capacity and speed can be summarized as three categories:

- Level 1: Capable of charging at 120V, 20A. This is equivalent to a standard home outlet.
- Level 2: Capable of charging at 240V, 30-40A. This is the service capacity typically used for larger appliance loads in homes.
- Level 3 (DC Fast Charging): Capable of charging at 20-400kW. This is the type of charger used for Tesla Superchargers and DC Fast Chargers at some public or commercial sites.

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The 2019 California Green Building Code Update (Title 24, Part 11) increases requirements for electric vehicle charging infrastructure in new construction; including:

- New one- and two-family dwellings and townhouses with attached private garages: must be Level 2 EV-capable
- Multi-family dwellings: 10% of parking spaces must be Level 2 EV-capable
- Non-residential: 6% of parking spaces must be Level 2 EV-capable

Discussion/Analysis

Building Appliance Electrification

For multiple reasons including health, safety, economic, and environmental benefits, there is considerable interest in mandating all-electric new construction, or "building electrification," which means that the buildings would not have any fossil fuel services. All-electric buildings have electric appliances for space heating, water heating, clothes-drying, and cooking. The interest in building electrification stems from the fact that Silicon Valley Clean Energy (SVCE) is providing 100% carbon-free electricity and eliminating the use of natural gas can greatly reduce greenhouse gas emissions from the building industry sector. To date, Los Altos does not often see all-electric buildings constructed. Mandating that all new construction be all-electric through the building reach code process has not been chosen as the appropriate path because of legal implications in proving cost-effectiveness of this approach to the CEC. The leading approach is to encourage electrification by giving builders the choice of two options:

1. Achieving a higher energy efficiency level than the Energy Code using mixed fuels (natural gas and electricity); or
2. Building an all-electric building at the minimum efficiency as required in the Energy Code. The Statewide Program's study analyzed this approach.

Electric Vehicle Charging Infrastructure

Local residents are showing a significant interest in electric vehicles. For example, the number of registered plug-in vehicles in Santa Clara county increased by 31% in 2018 and registrations for vehicles powered by fossil fuels shrank in 2018. It is widely known that availability of EV charging infrastructure is a critical component to EV adoption. Meanwhile, it is significantly more expensive to install charging infrastructure as a retrofit than it is during new construction. As such, ensuring that newly constructed residential and non-residential parking has ample EV charging capability will reduce long-term costs of EV infrastructure installation, while helping to increase EV adoption and decrease transportation-related greenhouse gas emissions. While California's new minimum requirements are a step forward, it is unlikely that the requirements for multi-family dwellings and non-residential buildings are enough to keep pace with expected EV growth looking towards 2030.

Subject: Building Electrification and Electric Vehicle Infrastructure Reach Codes – Proposed Reach Codes for 2019 Energy Code

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The Statewide Program's team reviewed approaches to increase the amount of EV infrastructure in new construction buildings, while keeping construction costs as low as possible.

Building Appliance Electrification Reach Codes:
Staff and the Environmental Commission have worked closely with SVCE to interpret the study's results and infer what options may or may not be cost-effective for the building types that are prevalent in Los Altos. Peninsula Clean Energy (PCE) and SVCE have also provided consultant support to assist cities in understanding the cost-effectiveness study results and adopting reach codes. The proposed reach codes meet the requirements of the CEC for cost-effectiveness, and are also a cost-effective approach for constituents, contractors, and developers pursuing new construction with the city limits. In addition, the analysis results show that all-electric buildings are typically less expensive to construct.

The recommended reach code requirements for newly constructed buildings using electrically-heated mixed-fuel are dependent upon the building type per the attached ordinance.

Electric Vehicle Charging Infrastructure Reach Codes
Unlike amendments to the Energy Code, a cost-effectiveness study is not required for amendments to Title 24, Part 11, or the Green Building Code "CALGreen" which covers items such as electric vehicle (EV) charging infrastructure. However, to evaluate the financial impact on first costs, PCE/SVCE commissioned an analysis of the total cost of implementing various EV infrastructure measures. Staff have worked closely with Peninsula Clean Energy, Silicon Valley Clean Energy, and the Statewide Program's team to establish new construction EV requirements which are more in-line with local EV adoption trends, while providing flexibility for the builder and keeping construction costs as low as possible.

Recommended requirements for EV infrastructure are:

Residential

- Single Family Dwelling: One dedicated "plug and play" Level 2 EV circuit, and if multiple parking spaces are provided for a dwelling unit, one dedicated "plug and play" Level 2 EV circuit and one dedicated "Capable" Level 2 EV circuit.
- Multi-Unit Dwelling, <20 units: Per unit, a single "plug and play" Level 2 EV circuit
- Exception: Not required for units without parking
- Multi-Unit Dwelling, >20 units: 75% of the units, a single "plug and play" Level 1 EV circuit; 25% of the units, a single "plug and play" Level 2 EV circuit
- Exception: Not required for units without parking

"plug and play" is defined as a full circuit installed including capacity to deliver electricity and outlet.

Non-Residential Office

- 10% of the parking spaces, Level 2 EV charging infrastructure installed
- 10% of the parking spaces, "plug and play" Level 1 EV circuits
- 30% of the parking spaces EV capable at the pinch points utilizing at least Level 2-sized conduit with panel capacity for 2kW per EV capable parking space

Non-Residential, Non-Office

- 6% of the parking spaces, Level 2 EV charging infrastructure installed
- 5% of the parking spaces, "plug and play" Level 1 EV circuits
- For parking lots with over 100 spaces, first hundred spaces must adhere to Level 1 & Level 2 requirements, with option to substitute 80kW DC fast charger for subsequent sets of 100 spaces.

Once the reach codes are adopted – they must be submitted to the State of California for review and approval – the draft ordinance has been crafted to reflect that the reach codes go into effect once this approval by the State is granted.

A draft ordinance that amends the Building Code and adopts the Reach Codes is included with the agenda report; however, this is not the final version of the ordinance. The final version of the reach code ordinance can take one of several forms and as of the date of packet publication the Environmental Commission had not finalized its recommendation to the City Council on an appropriate version of these codes. It is anticipated that the Environmental Commission will finalize its recommendation on the Reach Code at its meeting of October 14 and the resulting ordinance will be provided to the City Council before its October 22 meeting, at which the ordinance may be considered for introduction. It is not a requirement that the Reach Codes be adopted at the same time as the new building code updates – they can be introduced/adopted later.

A representative from Silicon Valley Clean Energy (SVCE) will be in attendance at the City Council meeting to provide an overview of the proposed reach codes and electric vehicle infrastructure codes. Should the Environmental Commission not have reached a final version of the ordinance if wants to recommend to the City Council – this place on the agenda will serve as a study session that can assist in introducing these propose code amendments to the Community.

Subject: Building Electrification and Electric Vehicle Infrastructure Reach Codes – Proposed Reach Codes for 2019 Energy Code

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Options

1) Hold only a study session on the reach codes

Advantages: Informative to the City Council and the Community on the proposed amendments and expectations for new construction in the future.

Disadvantages: Will delay, to a small degree, implementation of the proposed code amendments.

2) Introduce and waive further reading of Building Electrification and Electric Vehicle Infrastructure Reach Codes

Advantages: Reduce carbon emissions associated with new construction, improve indoor air quality and building safety, support affordable housing, and increase adoption of electric vehicles.

Disadvantages: None identified.

3) Do not introduce and read Building Electrification and Electric Vehicle Infrastructure Reach Codes

Advantages: None identified.

Disadvantages: Fail to follow PCE and SVCE member agencies that adopt reach codes to reduce carbon emissions associated with new construction, improve indoor air quality and building safety, support affordable housing, and increase adoption of electric vehicles.

Recommendation
The Environmental Commission recommends Option 2, assuming a draft of the appropriate version of the ordinance is finalized.