Attachment A

Memo

December 14, 2024

To: Victoria Morin, Ursula Syrova, and Sean Hatch, City of Cupertino

From: Walker Wells and Sami Taylor, Raimi + Associates

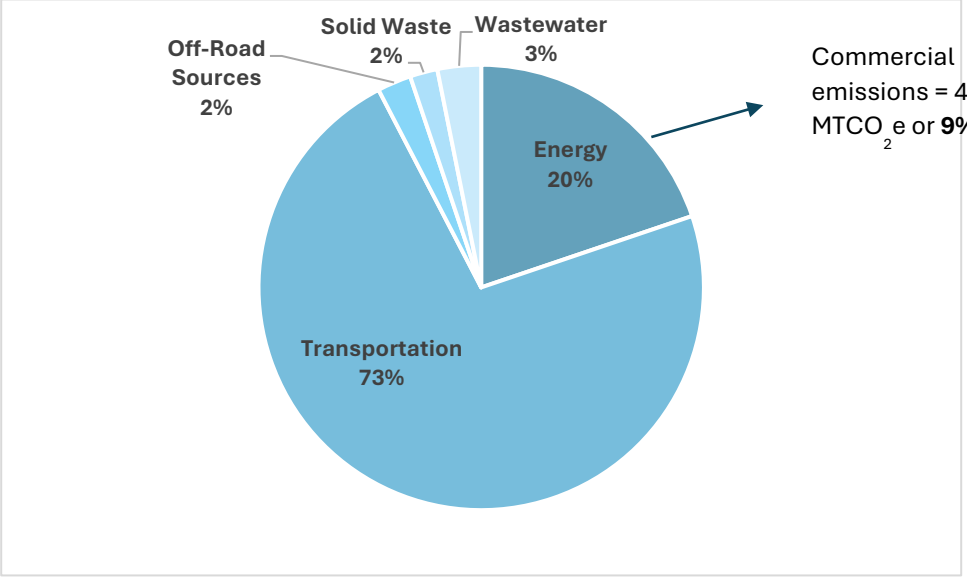
Subject: Cupertino Commercial Building Decarbonization Strategy Options

Background

This memo provides an analysis of policy strategies that could be used to promote the decarbonization of existing commercial buildings in the City of Cupertino.

Cupertino has adopted the ambitious climate goals of a 50% reduction in greenhouse gas (GHG) emissions by 2030 and carbon neutrality by 2040. To achieve these targets, each sector will need to substantially reduce emissions, eventually to zero. According to the greenhouse gas inventory used in preparing the City's Climate Action Plan (CAP) 2.0, building related energy use is the source of 25% of communitywide GHG emissions, with commercial buildings accounting for 9% (see Figure 1).

Figure 1: City of Cupertino 2021 Communitywide Emissions (437,190 $MTCO_2e$)



To achieve carbon neutrality, fossil fuel systems in buildings, including gas-powered water heaters, furnaces, clothes dryers, and stoves, must be replaced with zero-emission alternatives. While some transition will occur through the natural cycle of equipment upgrades and replacement, regulatory and programmatic interventions can accelerate the decarbonization of buildings in the city.

Alignment with City Plan and Policies

Cupertino's 2022 CAP 2.0[1] outlines several building-related strategies to reduce GHG emissions:

- **BE 1.3** Establish an energy benchmarking program in Cupertino that requires large commercial entities (over 10,000 square feet) to report their energy usage and energy procurement details.
- **BE 3.2** Develop a commercial building electrification strategy (CBES), building on the existing Baseline Buildings Study from SVCE (2020).
- **BE 3.3** Conduct engagement for the commercial sector to understand potential concerns and barriers to commercial electrification.
- **BE 3.5** Adopt an electrification ordinance for existing commercial buildings, which bans expansion of natural gas infrastructure, requires electrification of natural gas appliances at time of major renovation and time of replacement.
- **BE 3.7** Conduct engagement efforts for the commercial sector to identify ways the City can support commercial battery storage installations and improve local grid resiliency.[2]

The above strategies direct the City to adopt policies and establish programs that will decarbonize residential and commercial buildings by switching to electric appliances and building systems. Strategy BE 3.7 related to battery storage is considered as part of this effort because installing on-site renewables and storage is a potential compliance pathway for the proposed policies. Electric building systems and appliances can capture the greatest environmental benefits by operating on the clean power supplied to the City by Silicon Valley Clean Energy (SVCE).[3]

BE 3.5 which bans natural gas is no longer feasible because of the "Berkeley Ruling." As such, local jurisdictions are pivoting from electric mandates and gas bans to other policies such as creating public health standards like the BAAQMD rules related to combustion appliances, discussed below, or establishing performance standards for carbon. These approaches can result in building owners choosing to electrify their properties, while meeting EPCA's preemption exceptions.[4]

Alignment with Regional and State Policy and Incentives

Cupertino's CAP 2.0 strategies align with State and regional efforts to decarbonize buildings (Figure 2). These trends include the following:

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[1] The City of Cupertino's Climate Action Plan 2.0 is available on the city website here: https://www.cupertino.org/our-city/departments/environment-sustainability/climate-action.

[2] More specific information about each measure can be found in the City's CAP 2.0. Available here: https://www.cupertino.org/our-city/departments/environment-sustainability/climate-action.

[3] SVCE supplies 100% carbon neutral energy to customers. More information about electric sources and carbon intensity can be found in the 2022 Power Content Label available here: https://svcleanenergy.org/wp-content/uploads/PCL-Commercial_ADA.pdf.

[4] The Berkeley Ruling refers to the Ninth Circuit decision in California Restaurant Association v. City of Berkeley which holds that Berkeley's gas ban violates the U.S. Energy Policy & Conservation Act (EPCA). The Ninth Circuit broadly interpreted EPCA preemption clause to prohibit state and local standards that interfere with "the end user's ability to *use* installed covered products at their intended final destinations" (Turner, Amy. 2023. "Ninth Circuit Holds Berkeley's Gas Ban Preempted by U.S. Energy Policy & Conservation Act." Columbia Law School Sabin Center for Climate Change Law. https://blogs.law.columbia.edu/climatechange/2023/04/18/ninth-circuit-holds-berkeleys-gas-ban-preempted-by-u-s-energy-policy-conservation-act/).

- **Bay Area Air Quality Management District (BAAQMD) Rules 9-4 and 9-6:** Starting in 2027, only zero NOx **(**non-combustion) water heaters may be sold and installed, and in 2029, only zero NOx HVAC systems may be sold and installed within the district, using a phased approach.[5]
- **Building Code Update Cycle:** California Building Standards Code (Title 24) and the associated Energy Code (Title 24, Part 6) and CalGreen Standard (Part 11) are updated every three years. The next update, which goes into effect on January 1, 2026, includes electric heat pumps as the standard for operational efficiency.[6]
- **Regional Coordination on Reach Codes:** Silicon Valley Clean Energy (SVCE) is coordinating with multiple cities to develop, revise, or replace electrification reach codes for new construction and existing buildings in order to comply with the federal Energy Policy Conservation Act (EPCA) and meet California Energy Commission (CEC) cost-effectiveness criteria. These actions are largely in response to the "Berkeley Ruling" which ruled that all-electric requirements were in conflict EPCA.
- **Incentives:** Utilities, BayREN, and SVCE are encouraging voluntary electrification through financial incentives and rebates.
- **Assembly Bill 802:** AB 802 is California's Building Energy Benchmarking Requirement adopted in 2015. It requires all buildings 50,000 square feet and larger to report building energy and water use to the State.[7]

Figure 2: Regional and State Context for Building Electrification

[5] BAAQMD. 2023. Rules 9-4 and 9-6 Building Appliances. https://www.baaqmd.gov/rules-and-compliance/rule-development/building-appliances. Accessed September 25, 2024.

[6] The 2025 CALGreen building code efficiency standards are available here: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2025-building-energy-efficiency.

[7] More information about the regulation is available here: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-benchmarking-program.

Community Engagement

The process of evaluating building electrification options is informed by input from the community, specifically commercial property and business owners. The City held a stakeholder roundtable in September 2024 to educate property owners about existing building decarbonization options and solicit feedback on prospective policies and programs. Retail, office, and large multi-family properties were represented, all had a majority positive response to the proposed options. Some of the most common comments are listed below:

- Many property owners are already benchmarking their larger buildings and are familiar with EnergyStar Portfolio Manager.
- Concerns about meeting performance requirements due to bottlenecks for efficiency upgrades such as fixed annual O&M budgets and organizational structure.
- Concerns related to data privacy and anonymity.
- Desire to align Cupertino's program with existing AB 802 reporting timeline.

The City also hosted a small business resource fair in December 2024 to connect small businesses and property owners with resources and incentives for energy efficiency and electrification upgrades. The main takeaways from this event included:

- 64% of attendees were supportive or very supportive of a new annual energy reporting requirement that helps reduce greenhouse gas emissions. The remaining attendees were neutral.
- 57% of attendees are already tracking building energy use.
- 29% of attendees have already made energy efficiency improvements to their buildings.

The City made additional but unsuccessful attempts to reach out to targeted stakeholders including strip mall and shopping center owners and tenants as well as other smaller commercial property owners throughout the city. As a result, additional community outreach should be conducted as part of future building decarbonization policy or program development effort.

Commercial Building Decarbonization Policy Pathways

The City has considered several different policy approaches to encourage and/or require electrification in existing commercial buildings. The two policy options that are the most feasible are described and evaluated below. These are:

- Building Performance Standard (BPS)
- Flex Path reach code

A growing cohort of cities nationally have adopted policies using both these approaches. Several local jurisdictions are also currently considering them through support from SVCE and neighboring Community Choice Aggregation (CCA) programs. These policies are designed to prepare buildings for future electrification upgrades or require electrification of building components at certain "trigger" moments, such as application for a building permit (major renovation).

Evaluation Criteria

Each of the policy options is evaluated using the following criteria:

- Number of buildings covered/impacted
- GHG reduction potential

- Relative cost to property owners
- Equity
- Municipal administrative needs for implementation

The BPS program approach and the Flex Path reach code capture different types, sizes, and numbers of buildings, resulting in different energy use reductions and GHG emission benefits. The number of buildings is a contributing factor to the impact that any existing building decarbonization policy will have.

Cost is considered in two ways in this analysis. The upfront cost to individuals and/or property owners is estimated to convey the financial implications of the policy strategies.[8] The second component is the administrative impact to the City related to implementing the different strategies. The administrative impact of the programs is evaluated in terms of the ability to utilize existing City staff, programs, or processes; the need for additional staff; and the need for additional interdepartmental coordination.

An essential aspect of an effective decarbonization policy or program is to ensure that the policy does not place disproportionate financial or other negative impacts on vulnerable populations and communities. Building electrification almost always has a cost to the property owner. A concern is that these costs could create a significant financial burden on low- or fixed-income property owners. Another concern is that the cost of electrification upgrades could result in unsustainable increases in rent for tenants. Policies should be structured to recognize vulnerable populations and provide protection from regressive economic impacts through the inclusion of green leases, pass-through cost prohibitions, etc.

Access to electrification benefits can be increased by structuring programs and incentives in a way that recognizes the full costs of decarbonization retrofits, which may include upgrades to electrical panels and new wiring in addition to the cost of appliances or equipment. Many property owners have limited capital available for upgrades. Furthermore, the City can practice targeted outreach that connects resources with vulnerable populations, low- or fixed income individuals, and tenants.

Building Performance Standard

Program Description

Building Performance Standards (BPS) are policies that require commercial and multifamily buildings over a specified size to meet certain established performance levels for energy use intensity (EUI) or greenhouse gas emissions intensity ($kgCO_2e$) per square foot. Components include: 1. Annual Benchmarking of energy and water consumption with EnergyStar Portfolio Manager, 2. Reporting results to the City/State, and 3. Buildings need to meet an established performance standard over time.

BPS can be designed to allow for compliance through multiple pathways such as energy efficiency, behavior change, or electrification. Performance thresholds could be reduced in future compliance

[8] Studies related to existing building electrification cost effectiveness can be accessed here: https://localenergycodes.com/content/resources/?q=efficiency%20and%20electrification%20for%20additions%20and%20alterations.

phases (years) to levels that would require either fuel switching, carbon capture and removal, or the purchase of certified carbon offsets to achieve building decarbonization.

The greater the number of buildings included in the program, the greater the GHG emissions reductions. A building performance standard may produce only modest GHG reductions per building in each compliance period but apply to a larger number of buildings and thus result in a greater overall emissions reduction potential. Table 1 shows the number of buildings in Cupertino that could be impacted by a BPS.

Table 1: Total Buildings in Cupertino Impacted by BPS

Building Size	Total Number of Commercial/ Multifamily Buildings reporting	Comments
Above 50,000 sq ft	127	Currently reporting to state
Above 20,000 sq ft	314	
Above 15,000 sq ft	504	
Above 10,000 sq ft	923	Threshold that is indicated in CAP 2.0
Total commercial buildings	3,280	Total excludes schools, parking lots, playgrounds, multifamily with < 5 units, and public facilities

There are three types of BPS: Benchmarking Plus, Energy Use Intensity, and Emissions Intensity. Beyond Benchmarking programs build on benchmarking programs and require improvements over time if buildings do not meet the performance threshold. Many cities have included multiple compliance pathways including administrative (e.g. energy audit or systems retrocommissioning), prescriptive (e.g. a list of improvement measures), or performance (e.g. already meets performance requirements).[9] Cities that have adopted this type of BPS include San José, CA and Brisbane, CA among others. An Energy Use Intensity (EUI) BPS requires that covered buildings benchmark, report, and meet increasingly stringent energy use per square foot over each compliance period (kBtu/sf/year). An Emissions Intensity BPS requires that covered buildings benchmark, report, and meet increasingly stringent energy use per square foot ($kgCO_2e$/sf/year) over each compliance period.

For each type of BPS, the City can set the standard based on the average energy use or emissions of a building or occupancy type or relative to each individual building's performance. For example, Denver, CO, and New York City, NY, established targets based on data for each Portfolio Manager building type and Cambridge, MA established thresholds relative to individual building baselines (see Figure 3). [10]

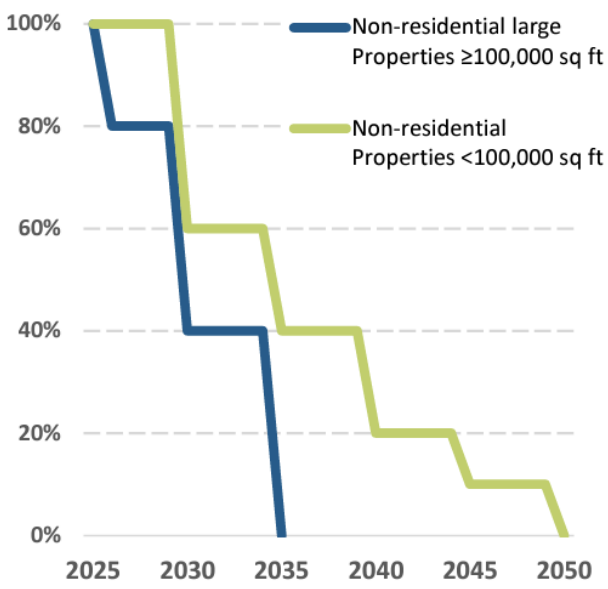
[9] The City of Brisbane, CA provides an example of Beyond Benchmarking requirements: https://www.brisbaneca.org/bbep.

[10] The City of Denver, CO provides an example of EUI requirements: https://www.denvergov.org/Government/Agencies-Departments-Offices/Agencies-Departments-Offices-Directory/Climate-Action-Sustainability-and-Resiliency/Cutting-Denvers-Carbon-Pollution/High-Performance-Buildings-and-Homes/Energize-Denver-Hub/Buildings-25000-sq-ft-or-Larger/Performance-Requirements.

Figure 3: Examples of Performance Thresholds Relative to Prototype Buildings and Individual Buildings

EPA Portfolio Manager Building Type	2030 EUI Target (kBtu/sf/yr.)
Adult Education	37.2
Ambulatory Surgical Center	60.7
Aquarium	30% EUI Reduction
Automobile Dealership	42.8
Bank Branch	63.6
Bar/Nightclub	86.6
Barracks	46.3
Bowling Alley	50.5
College/University	60.6
Convention Center	30% EUI Reduction
Courthouse	51.2
Distribution Center	25.4
Enclosed Mall	45.6
Fast Food Restaurant	311.3
Financial Office	48.3
Fire Station	45.6
Fitness Center/Health Club/Gym	50.5
Food Sales	144.3
Food Service	76.9
Hospital (General Medical & Surgical)	165.2
Hotel	61.1

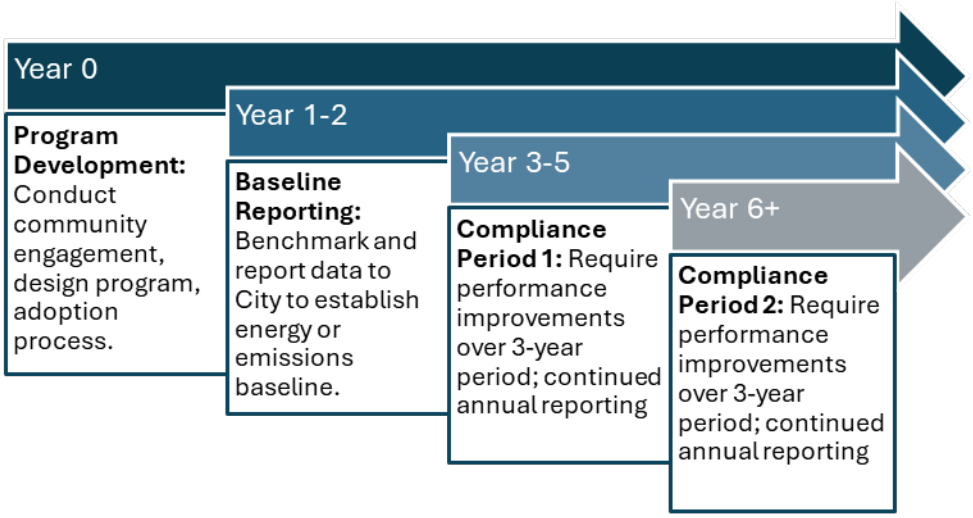
Prototype: Denver, CO (EUI)



Individual: Cambridge, MA (Emissions Intensity)

The BPS program would generally follow a timeline similar to the outline in Figure 4:

Figure 4: BPS Timeline



Administrative Cost

The administrative cost to the City for program implementation is likely the same for each type of BPS. The highest costs are incurred as part of program design, roll-out, and the first phase of implementation. Costs and the level of continuing staff time needed may vary slightly based on the number of buildings covered by the program. For reference, the City of Brisbane (population of 10,000 residents) spent nearly $300,000 on program start-up costs, utilizing grant funding and hiring a consultant for assistance.[11]

Depending on how the program is designed, the City could participate in a supporting role and shift most implementation costs to the property owners who would be responsible for setting up Portfolio Manager[12] (free energy management software provided by EPA), tracking and reporting their energy use, and potentially upgrading their buildings. Benchmarking and reporting would likely cost the property owner less than $1,000 per building per year based on research and quotes from consultants who provide these services.

The role of city employees would be to design and administer the program. That role entails establishing performance requirements, tracking, reporting, and performance compliance, and likely some quality control of submitted data. These jobs would likely take 0.5-1 FTE annually, depending on the number of covered buildings, with workload corresponding to the reporting and compliance timing.

Considerations when developing the BPS ordinance after benchmarking has been established:

When developing a BPS, there are many elements to consider, like timing, the reporting process, support available, and enforcement. These questions and options listed below would be addressed in further reports if the City decides to pursue this approach.

How should the City time phasing requirements be for the different building sizes?

> There are several options that other jurisdictions have adopted, and further research is needed before determining the feasibility for Cupertino's buildings.

How should the thresholds be measured?

Option 1: Energy Intensity Units (energy use per square foot)

- Benefit: This is the method used by the state reporting, creating consistency.
- Drawback: It does not consider the whole picture.

Option 2: Greenhouse gas emissions per square foot

- Benefit: This considers the source of energy such as renewable energy or nonrenewable energy sources. It also considers time-of use.
- Drawbacks: It is harder to calculate and is more difficult for the average property owner to understand the details.

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[11] According to a February 2020 City of Brisbane staff report approving the consultant contract for Beyond Benchmarking, the City budgeted $299,000 to adopt the ordinance, begin implementation, and develop user resources and conduct community education. The staff report is available here: https://mccmeetingspublic.blob.core.usgovcloudapi.net/brisbaneca-meet-b70198c62788436e99d306e82009a283/ITEM-Attachment-001-c0a492f2b26c4381bd157ec5d24b6695.pdf. Accessed December 2, 2024.

[12] EnergyStar Portfolio Manager: https://www.energystar.gov/buildings.

How should building performance and progress be measured?

Option 1: City-established performance threshold (targets set by building type and use).

- Benefit: Standardized goals for each building type.
- Drawback: Technical expertise and data are required to establish prototypical building baselines. This expertise would likely exceed city staff capacity.

Option 2: Individual building performance threshold (each building improves on its own score)

- Benefit: Reduced technical expertise burden on city staff; provides option for mixed-use buildings because performance is relative to itself.
- Drawback: Less standardized approach, potential for increased administrative effort by city staff each compliance period.

There are additional questions that would need to be explored further, such as:

- How should the City support property owners in complying (incentives, technical assistance)?
- How would multi-unit properties collaborate with the building owner on reporting?
- Should compliance flexibility be offered for BPS (e.g., offsets, Renewable Energy Credits)?

These questions would be answered if staff is directed to pursue this ordinance.

Flex Path Reach Code

Reach codes can be applied to alterations and additions to existing buildings, in addition to new construction. Flex Path reach codes allow property owners and contractors to select from a weighted menu of measures to achieve compliance. This affords them the opportunity to pick measures that best suit their plans and values. The approach consists of a target score and a menu of individual measures with points weighted by site energy savings. Applicants may select a set of measures that meet or exceed the target. Figure 5 provides an example of options.

The Flex Path generates GHG reductions and meets Federal and State requirements because it is based on energy consumption and does not restrict use of Federally approved appliances. It is also demonstrated to be a cost-effective compliance pathway by the CEC.[13]

Although this reach code is relatively simple to administer as an amendment to the CALGreen building code (Title 24 Part 11) or energy code (Title 24 Part 6), based on review of Cupertino permit data, its efficacy would be limited because very few commercial buildings undertake renovations each year. Permit data shows that **fewer than 100 buildings pull permits for renovations annually**. In 2023 there were 56 permits totaling 173,415 square feet of renovated space. 55% of those permits were less than 1,000 sq feet. and through November 2024 there were 68, all of which were tenant improvements. This limited reach would result in a small GHG reduction potential. A Flex Path reach code that requires upgrades to existing buildings at the time of remodel, may result in significant energy reductions for an individual building, but may only apply to a small number of buildings or appliances each year, resulting in a low overall GHG reduction.

[13] For more information about the FlexPath code and to review cost-effectiveness studies visit: https://localenergycodes.com/.

Although no local jurisdictions have adopted a Flex Path reach code for existing commercial buildings, many cities have adopted Flex Path reach codes for existing residential buildings including Santa Moncia, CA and Santa Cruz, CA, with additional jurisdictions exploring adoption.

Administrative Cost

Reach codes have a simple administration process that is implemented through the City's existing plan check and permitting processes. Adopting a reach code would not require any additional staffing by the city. The largest cost to the city would be the reach code development process, which includes community engagement, ordinance adoption, and filing with the California Building Standards Commission.

Summary and Recommendation

Table 2: Comparison of Existing Commercial Building Decarbonization Pathways

	Building Performance Standard	Flex Path Reach Code
Number of buildings covered/impacted annually	127-923	<100
GHG reduction potential	High	Low
Cost to property owner	Medium-High	Low-High
Equity considerations	Costs could create a significant financial burden on low- or fixed-income property owners or result in increases in rent for tenants. Policies should be structured to provide protection for vulnerable populations through the inclusion of green leases, pass-through cost prohibitions, etc.	
Municipal administrative impact	High	Low
Code amendment	Municipal Code	Building Code (Title 24 part 11) and/or Energy Code (Title 24 Part 6)
Who has done it?	Brisbane, CA; San Jose, CA; Denver, CO; Cambridge, MA; New York, NY	None for commercial Residential: Santa Cruz, CA; Santa Monica, CA

For the City to meet its long-term climate goal and become carbon neutral by 2040, aggressive policy interventions are needed to capture the city's whole existing commercial building stock.

The City could choose to pursue only a BPS, focusing on larger properties that have higher levels of energy use and thus greater potential for savings, or establish both a BPS and a local energy reach code like Flex Path to capture smaller properties when permits are pulled for renovations.

Establishing a building performance standard is the most effective policy option to address emissions from existing commercial buildings in Cupertino at the magnitude and pace outlined in the Climate Action Plan. Depending on the program threshold, the BPS would apply to 314-923 commercial and large multi-family buildings annually, representing 10%-28% of commercial buildings in the city. A Flex Path approach does not capture enough buildings annually to achieve the CAP 2.0 emissions reductions needed from the building sector. In 2023 only 56 commercial renovation permits were applied for, totaling 173,415 square feet or 2% of commercial buildings.

Additionally, a BPS program potentially has greater longevity than the Flex Path reach code for existing commercial buildings because it is likely that over the next two CALGreen building and energy code cycles (through 2028), many of the menu options will be incorporated into the building code and become required for major remodels.

BPS also offers flexibility in compliance. Similar to New York City's BPS Local Law 97[14] and Denver's BPS, performance compliance could be achieved initially through efficiency upgrades, fuel-switching, or the ability to buy verified carbon credits, renewable energy certificates (RECs), or offsets. The program can be designed to accommodate various building typologies and sizes. For example, prescriptive options could be developed for smaller buildings and allowances or incentives could be included for affordable housing.

Furthermore, the program itself could utilize a phased approach that allows property owners time to prepare. For example, year one could focus on education, year two could focus on reporting accurate data to Portfolio Manager, and year three could include the rollout of the BPS.

However, because the BPS would only cover buildings over a certain size, to achieve full coverage of the existing building stock and achieve its GHG goals, the City will need to consider additional education and outreach as well as incentives programs, including direct-install programs. This effort could be coordinated with SVCE, PG&E, and BayREN. Post-Berkeley ruling, without the ability to directly mandate building electrification, the City needs to be more creative in encouraging buildings to decarbonize. The BPS allows for both efficiency and fuel-switching improvements while providing flexibility to property owners and acknowledging existing high performing buildings.

[14] More information about Local Law 97 can be found here: https://www.nyc.gov/assets/buildings/pdf/presentations/2023bsls/ll97.pdf.