SUSTAINABILITY DIVISION

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SUSTAINABILITY COMMISSION STAFF REPORT
Meeting: June 18, 2020

Subject

Subcommittee report and staff presentation on study of Green Building Codes and consideration of CALGreen Tier 1 and 2 options.

Recommended Action

Discuss policy options and recommend that City Council maintain existing Cupertino Green Building Ordinance.

Background

In 2015, the City Council adopted the City's Climate Action Plan (CAP)[1] to put Cupertino on the path to achieve a 15% reduction in carbon emissions by the year 2020, 49% reduction by 2035, and 83% by 2050. The first goals of the CAP are to increase energy efficiency in homes and buildings, and to increase the use of carbon-free energy communitywide.

Related Climate Action Plan measures include:
- C-E-1 building energy usage.
- C-E-5 solar development.
- C-T-7 EV infrastructure.
- C-W-1 water conservation.
- C-SW-3 construction & demolition diversion.
- C-G-1 urban forest and cool roofs.

California Green Building Standards Code (CALGreen)

Since the mid 2000s, numerous local governments in California have implemented green building ordinances. In 2007, the California Building Standards Commission (CBSC) began developing a statewide green building code to meet the goals of California's AB32 initiative, which established a comprehensive program of cost-effective reductions of greenhouse gas emissions (GHG). The result is the first-in-the-nation Green Building Standards Code contained in Part 11 of the California Building Standards Code. This code section is often referred to as CALGreen. The goals of CALGreen are (1) reducing GHG

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[1] https://www.cupertino.org/our-city/departments/environment-sustainability/climate-action

from buildings; (2) promoting environmentally responsible, cost-effective, healthier places to live and work; (3) reducing energy and water consumption; and (4) responding to the environmental directives of the California Governor's Office.

The first edition of CALGreen contained only voluntary measures and was effective statewide beginning in 2009. Mandatory measures were then required beginning in 2011. As is common with other sections of the California Building Standards Code, CALGreen is updated on a three-year code cycle to adopt emerging and established construction best practices.

Later editions of CALGreen also include additional measures that are voluntary state-wide but provided for local agencies to consider adopting as might benefit their local conditions. These voluntary measures are known as CALGreen Tier 1 and Tier 2, indicating their relative aggressiveness compared to the mandatory measures. These voluntary tiers are the subject of the study requested by the Sustainability Commission and City Council.

Cupertino's Green Building Ordinance – History and Features
Cupertino's local green building ordinance went into effect in 2013. The ordinance provides rules for mixed-use developments, non-residential renovations, new non-residential construction, major multi-family residential renovations greater than 35,000 square feet, and single-family residential construction of more than nine homes. The ordinance guides the design, construction, retrofit, operation and demolition of properties in Cupertino, and was intended to go above and beyond the statewide CALGreen mandatory measures. This was accomplished by aligning the standards to third-party rating systems developed and maintained by the US Green Building Council and Build It Green, otherwise known as the Leadership in Energy and Environmental Design (LEED) and GreenPoint Rated (GPR) rating systems. A summary of Cupertino's green building ordinance is below.

Renovations and Additions

Project Type	Minimum Green Building Requirement	Required Verification
Residential		
Single Family	CALGreen Building Code in accordance with CALGreen's minimum thresholds	City Review
Multi-Family (minor)	CALGreen Building Code in accordance with CALGreen's minimum thresholds	City Review
Multi-Family (major): Renovations and/or additions with a FAR increase of ≥ 50% and at least 35,000 SF, and that replace or substantially alter the HVAC systems and at least two of the following: building envelope, hot water system, lighting system.	• GPR certified at min. 50 pts or • LEED Certified or • LEED EBOM Certified or • Alternate Reference Standard per Section 101.10.2	• Third Party GPR or LEED certification as applicable • Alternate Reference Standard
Nonresidential		
Minor: Renovations and/or additions that do not meet the higher thresholds for "major" renovations and additions outlined below.	CALGreen Building Code	City Review
Major: Renovations and/or additions with a FAR increase of ≥ 50% and at least 35,000 SF, and that substantially alter the HVAC systems and at least two of the following: building envelope, hot water system, lighting system.	• LEED Certified applicable only to area of renovation/addition or • LEED EBOM Certified or • Alternate Reference Standard per Section 101.10.2	• Third Party GPR or LEED certification as applicable • Alternate Reference Standard

Mixed Use
For new and renovation/addition projects with residential and non-residential components, the use shall comply by either:
1. Meeting the applicable requirements for each use; or
2. Meeting the applicable requirements for the use that comprises the majority of the project's square footage where uses are attached and/or combined in a building.

New Construction

Project Type	Minimum Green Building Requirement
Residential	
Single Family and Multi-family homes equal to or less than 9 homes	CALGreen Building Code minimum
Single Family and Multi-family homes equal to or greater than 9 homes	• GreenPoint Rated or • LEED Silver
Nonresidential	
Small: less than 25,000 SF	CALGreen Building Code minimum
Mid-size: 25,000-50,000 SF	• LEED Certified
Large: greater than 50,000 SF	• LEED Silver

Even though there have been different versions throughout the years, the basis of LEED is a point system where building projects are required to fulfill all prerequisites and minimum program requirements, while additional measures are combined across sustainability categories to earn points. These categories are similar to the CALGreen categories of Planning and Design, Energy Efficiency, Water Efficiency and Conservation, Material Conservation and Resource Efficiency, and Environmental Quality. There are four different certification levels: Certified, Silver, Gold, and Platinum. When a project applicant proves it meets the prerequisites in each category, and a certain number of points, the USGBC will issue a LEED certificate for the achieved level of environmental performance. In Cupertino, a mid-sized new development must earn a minimum of 40 points for Certified, and a larger project must earn 50 points for Silver. A project must receive third-party verification and the certificate within 18 months of project completion to be compliant with Cupertino's ordinance.

No major changes have been made to Cupertino's green building ordinance since its adoption. However, by aligning with the LEED and GPR rating systems, the measures have been updated on average every 3 years, with the intent to both reflect advances in the construction industry and to promote emerging commercially available technology and practices.

A developer or property owner planning a project must show compliance with the Cupertino Green Building Ordinance, in addition to the CALGreen mandatory measures. This is described in the Cupertino Municipal Code, Title 16, section 58.250 (Verification) and requires that the project is registered with a third-party rating system and obtains official certification.

Consideration of CALGreen Tier 1 and Tier 2 Measures
In August of 2019, the Sustainability Commission, Sustainability Division, and Building Division were tasked to study updates to the Green Building Ordinance and to consider a decarbonization building code that takes advantage of the carbon-free electricity source from Silicon Valley Clean Energy (SVCE). The Commission suggested that staff consider building electrification and additional infrastructure for electric vehicle (EV) charging. Commissioners expressed preference for more aggressive all electric measures, but with consideration of the implications for home renovation and housing affordability.

The Commission also provided feedback to staff to consider adopting CALGreen Tier 1 or Tier 2, or some combination of both. Staff studied the CALGreen Tier 1 and Tier 2 voluntary measures for further environmental performance beyond the existing standards. A discussion of that study follows.

It was found that the existing Cupertino green building ordinance, which requires third-party green building certification (LEED or GreenPoint Rated) for new construction is already quite robust. The Sustainability Commission affirmed that the existing green building code was stronger than CALGreen and met the goals of the CAP, without

requiring any changes. While this was expressed at the November 19, 2019 Council study session, on December 17, 2019 Council requested that the green building code be revisited with a comparison to other cities.

Discussion

To demonstrate how the current Green Building Ordinance compares to the CALGreen Tiers, the following table shows a comparison between a recently completed project in Cupertino with the current standards.

The subject of the study is the 148-room, 5-story Hyatt House Hotel adjacent to the intersection of North Wolfe Road and Interstate 280. This project was awarded LEED gold certification in February 2020. The finding is that the project met most of the measures of CALGreen voluntary tiers, and in some categories went beyond CALGreen. This ability for a developer to be recognized for going beyond the mandatory measures is unique to third-party rating systems. In this regard, the LEED rating system rewarded additional environmental measures where the CALGreen Tier 1 or Tier 2 prescriptive measures would not. The project's complete LEED certificate and scorecard can be viewed at the USGBC website[2].

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[2] https://www.usgbc.org/projects/hyatt-house-cupertino

Recently Completed LEED Project in Cupertino and Comparisons to CALGreen Tiers
Green highlights indicate where the Tier 1 or Tier 2 measure was achieved with a comparable LEED point.

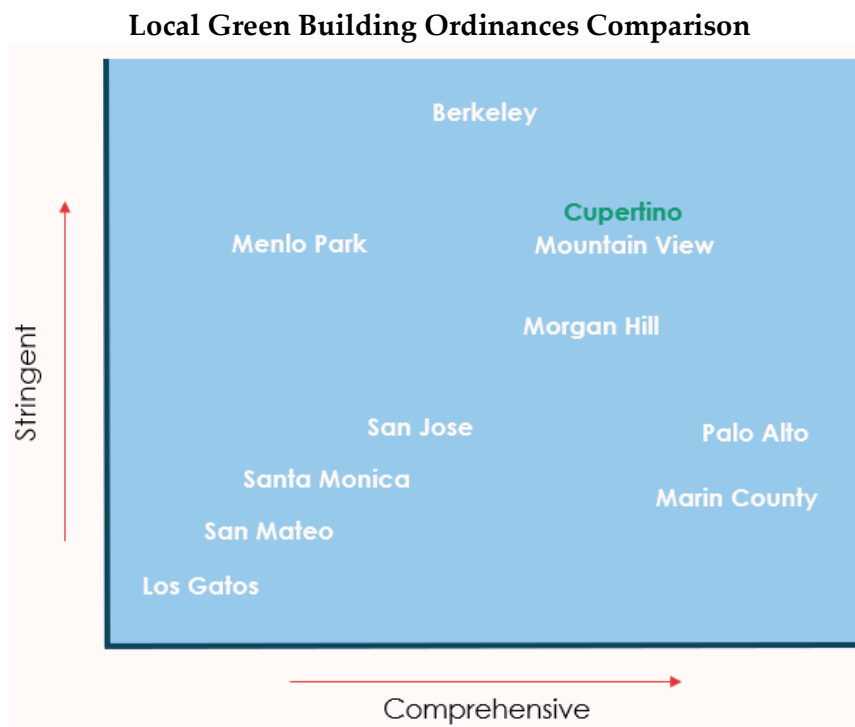| CALGreen Category	Environmental Performance Goal	Tier 1	Tier 2
Planning and Design	Designated Parking for Fuel Efficient Vehicles	10% of total spaces * Cupertino's recently enacted reach code would have required at least 10% of total parking spaces.	12% of total spaces
	Electric Vehicle Charging	8% of total spaces	10% of total spaces* * Cupertino's recently enacted electric building reach code requires Tier-2 level of electric vehicle charging stations.
	Cool Roof	Solar Reflective Index of 75/16	Solar Reflective Index of 82/27
		1 additional elective	3 additional electives
Energy Efficiency	Energy Performance	Outdoor Lighting 90%	Outdoor Lighting 90%
		Solar water-heating system if applicable	Solar water-heating system if applicable
		Day lighting	Day lighting
		Energy budget of 95%/90%	Energy budget of 90% or 85%
	Indoor Water Use	12% savings	20% savings
Water Efficiency and Conservation		1 additional elective	3 additional electives
	Construction Waste Reduction	At least 65% reduction	At least 80% reduction
Material Conservation and Resource Efficiency	Recycled Content	10% recycled content	15% recycled content
		1 additional elective	3 additional electives
	Low-VOC Resilient Flooring	90%	100%
Environmental Quality	Low-VOC Thermal Insulation	Comply with VOC limits	Install no-added formaldehyde insulation
		1 additional elective	3 additional electives
		1 additional elective from any category	3 additional electives from any category

Electric Vehicle Requirements and CALGreen Amendments
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. Since 2016, the number of electric vehicles registered in Cupertino more than doubled. As of October 2018, Cupertino's electric vehicle ownership rate of 6% is higher than the County's overall rate of 4%.

Given this data and support from City Council, Cupertino adopted an increased level of electric vehicle charging infrastructure for all newly constructed buildings as part of the all-electric reach code. These levels correspond to those required by Tier 2 of CALGreen.

Comparison to Other Cities
As part of public outreach and study, Cupertino's consultant prepared a comparison table of the existing green building ordinance with other agencies in California that have a comparable local green building ordinance. The study compared local green building ordinances in terms of both stringency and applicability which is summarized in the following tables. For example, Palo Alto requires new construction to be built to CALGreen Tier 2 standards, which is very comprehensive but only requires energy efficiency, not electrification. On the other hand, Menlo Park requires all-electric and solar, which is stringent but not comprehensive in terms of the sustainability measures or level of verification.

Local Green Building Ordinances Comparison

		Local Green Building Ordinances in California with Features Comparable to Cupertino				
	Type	**All-Electric**	**Electric- Preferred**	**Third Party Certification**	**Solar**	**EV**
San Mateo	CALGreen Minimum		All-electric or more energy efficiency measures			
Palo Alto	CALGreen Tier 2 for all new construction	Starting April 2020				
Marin County	CALGreen 2019 Tier 1 for all new construction		All-electric or CALGreen Tier 1			X
Santa Monica	CALGreen Minimum		All-electric or CALGreen Tier 1		X	
San Jose	CALGreen Minimum	SFR ADU	All-electric or more energy efficiency features			X
Menlo Park	CALGreen Minimum	NonRes, MFR, SFR for space, water heating, clothes drying			X	
Morgan Hill	CALGreen Minimum	NonRes, MFR, and SFR new construction		LEED or GreenPoint Rated certificate		
Cupertino	CALGreen Minimum	NonRes, MFR, and SFR/ADU new construction		LEED Silver or GreenPoint Rated certificate		X
Mountain View	CALGreen Minimum	NonRes, MFR, and SFR new construction		LEED "intent" but no certificate required	X	X
Berkeley	CALGreen Minimum	Natural gas infrastructure ban	All-electric or more energy efficiency features		X	X
Los Gatos	CALGreen Minimum					

Abbreviations key

SFR: Single family residential; **ADU**: Accessory dwelling unit; **NonRes**: non-residential building; **Solar**: Local ordinance requires higher level of solar energy than State minimum; **EV**: Local ordinance requires more electric vehicle charging ports than State minimum

The finding from the policy comparisons is that the existing Cupertino green building ordinance, which requires third-party green building certification (LEED or GreenPoint Rated) for new construction is already generating environmental performance outcomes comparable to CALGreen Tier 2. The findings from the comparison to other cities are that the only neighboring agency to have green building requirements similar in terms of comprehensiveness and stringency is Mountain View which requires LEED Gold compared to Cupertino's LEED Silver. However, it is worth noting that the City of Mountain View does not require third-party certification but rather depends on City staff to review a checklist.

By studying a recently completed project, it was found that similar or better environmental measures were put into place compared to the CALGreen Tier 1 or Tier 2. Another finding is that the developer in this case was motivated to seek higher levels of environmental performance, and thus the recognition of a Gold or Platinum certification.[3] This market-based recognition is one significant benefit of aligning with a third-party system such as LEED, as the prescriptive nature of CALGreen does not allow for this type of motivation.

Staff also found that the public comments received during the public outreach period focused largely on the benefits of all-electric reach code, which was adopted by Council and began enforcement for new developments seeking permits after January 2020. The all-electric reach code achieves a major reduction in GHG from new development in Cupertino.

Cupertino's Green Building Ordinance is designed to automatically evolve with the third-party rating system updates. LEED standards are updated by the US Green Building Council, currently on version 4.1. This alignment ensures the green building ordinance is updated to industry-standard green construction practices while avoiding the need to study and adopt a new ordinance each code cycle. By contrast, cities that adopt the CALGreen voluntary Tiers must consider and adopt these measures every three years. The avoided costs for Cupertino's current practice are estimated at $50,000 - $60,000 each code cycle. These savings are the result of avoiding consultant and legal costs associated with studying and implementing green building measures specifically for Cupertino.

Embedded Carbon
The Sustainability Commission Green Building Sub-Committee expressed interest in exploring the impact of greenhouse gasses that are contained within building materials and the supply chains that provide those materials, commonly referred to as embedded carbon or embodied carbon. The major sources of embodied carbon are in the building structural systems, enclosures, products and materials. The current version of the LEED rating system addresses embodied carbon in credits (not requirements) that reward the following building practices:

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[3] Communication from the project's LEED consultant to the Cupertino Planning Division

- Building reuse
- Whole-building life cycle assessment and environmental product declarations
- Material ingredient reporting
- Responsible sourcing of raw materials
- Waste reduction and management

These practices are incentivized in the current version of LEED and therefore in Cupertino's green building ordinance. However, the Subcommittee has identified at least two agencies that have taken action to require some level of embodied carbon management in two different ways: Palo Alto's deconstruction ordinance (effective July 1, 2020) requires "deconstruction" rather than demolition of entire structures. Marin County's embedded carbon ordinance requires environmental product declarations for low-carbon concrete and steel.

Conclusion

After considering the Tier 1 and Tier 2 green building standards, as well as the all-electric reach code, the Sustainability Commission Green Building Ordinance Subcommittee input and public comments, staff recommends the current green building ordinance remain as is, aligned to third-party rating systems. The current ordinance is stronger than the voluntary CALGreen Tiers in terms of breadth and stringency of measures, third-party verification, and market-based recognition. The LEED rating system requires (as mandatory) some measures across each of the CALGreen categories of environmental performance. The third-party verification is required and mandates that projects include a green building professional from design to final project close-out. The market-based recognition of LEED has an advantage over the prescriptive CALGreen Tiers – specifically, developers are motivated to achieve higher levels of performance under the existing Cupertino Green Building ordinance compared to the prescriptive checklist adopted by some other cities.

Based on the analysis of options available, cost/benefit to the City, and contribution to the Climate Action Plan, it is recommended that the Sustainability Commission recommend that Council make no changes to the City's green building ordinance at this time. Staff will monitor Marin County's implementation of its low carbon concrete code and continue to participate in dialog with other cities exploring embedded carbon policy options.

Next Steps:

1. Green Building Ordinance Subcommittee presents report to the Commission at its June 18, 2020 meeting.
2. Commission makes a recommendation to Council on the City's Green Building Ordinance.
3. Staff submits the analysis of the policy and results of the Commission's and staff's recommendations on the Green Building Ordinance to the City Council in a memo.

Sustainability Impact

As described above, the adopted all-electric buildings reach code makes a significant contribution to achieving the goals it set out in its Climate Action Plan. By virtue of the third-party rating systems, the green building ordinance continues to incorporate the best practices in green construction.

Fiscal Impact

Maintaining the existing Green Building Ordinance is not anticipated to result in additional costs to the City. Building officials are already transitioning to enforcement of the new California Building Standards as occurs normally on a three-year cycle. The new CALGreen code, effective January 2020, has mandatory requirements that continue to push all types of construction projects towards sustainability. Adopting Tier 1 or Tier 2 of CALGreen would require that Cupertino study and adopt these Tiers again every three years, presenting an estimated cost to the city of $50,000 to $60,000 for the required public outreach, consulting, and legal compliance.

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