

**From:** [Gary Latshaw](#)  
**To:** [Andre Duurvoort](#); [Gilee Corral](#); [Victoria Morin](#)  
**Subject:** Submittal of Comments on the Climate Action Plan  
**Date:** Sunday, May 15, 2022 8:53:58 PM  
**Attachments:** [Gary's comments as Submitted on May 15, 2022.pdf](#)

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Andre, Gilee, and Victoria - Please consider this attachment my comments. Also, please distribute the comments to the Sustainability Commissioners.

Thanks, Gary

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Fight for Renewable Energies! Save the global ecology; create jobs; eliminate dependence on foreign oil; reduce military requirements

Gary Latshaw, Ph.D.  
408-499-3006

Comments on Draft Climate Action Plan (CAP, April 2022)

by Gary Latshaw, Cupertino Resident

May 15 2022

The current version of the Draft CAP is an outstanding survey of current conditions and an excellent set of wide-ranging measures to reduce GHG<sup>1</sup> emissions. These comments are intended to improve upon it – particularly regarding natural gas consumption and the need to replace or retrofit Municipal buildings and equipments.

Cupertino is positioned, by virtue of being wealthy and by having the most educated population<sup>2</sup> in the Country, to lead in elimination of greenhouse gas emissions. The CAP should identify very specific measures that must be met to curb GHG emissions quickly and decisively in the short term (2030) including a total ban of natural gas (which is primarily methane) by 2040. In 2019 the City of Ithaca, NY<sup>3</sup>, Half Moon Bay 2045,<sup>4</sup> and Los Altos Hills (October of 2021 – CAP)<sup>5</sup> committed to decarbonize all their single buildings.

The highly regarded science writer Bill McKibben has put it succinctly: **“Going slowly is losing.”**

The City has control over the use of natural gas, which is a highly potent climate pollutant. Because of its high potency, the inevitable leakage in using it greatly increases its climate impact. As the Appendix explains, the GHG emission factor for methane should be multiplied by a factor of 2.41 to account for the effects of leakage. Methane has a global warming potential 86, over a 20-years period, times that of carbon dioxide. So even a minor leak in the extraction, processing, transporting, and combustion can result in a very harmful effect on the environment. The statement that any use of natural gas can be assigned an emission factor of zero is ludicrous, which has been done in the draft. The emission factors are developed from highly stylized and incomplete portrayals of reality. If we curtail methane emissions, atmospheric concentrations of methane will decline rapidly. The decline is much more rapid than curtailing carbon dioxide.

To demonstrate the influence of methane leakage, I have re-calculated Figure ES 1.

Cupertino Greenhouse Gas Emissions by Sector, 2018 from the CAP\_2.0\_Draft\_April\_2022.

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<sup>1</sup> GHG is a widely used abbreviation for Greenhouse Gases. These are gases in the atmosphere that cause warming above pre-industrial times.

<sup>2</sup> *Cupertino California is Now the #1 Most Educated Population in America, according to a 2022 Nationwide study*, Dwellics, March 16, 2022 (<https://www.prnewswire.com/news-releases/cupertino-california-is-now-the-1-most-educated-population-in-america-according-to-a-2022-nationwide-study-301496621.html>)

<sup>3</sup> Rooot, Tim, This U.S. city just voted to decarbonize every single building, Washington Post, Nov. 3, 2021

<sup>4</sup> Hal Moon Bay website captured on May 15<sup>th</sup>, (<https://www.half-moon-bay.ca.us/851/ARCHIVE>)

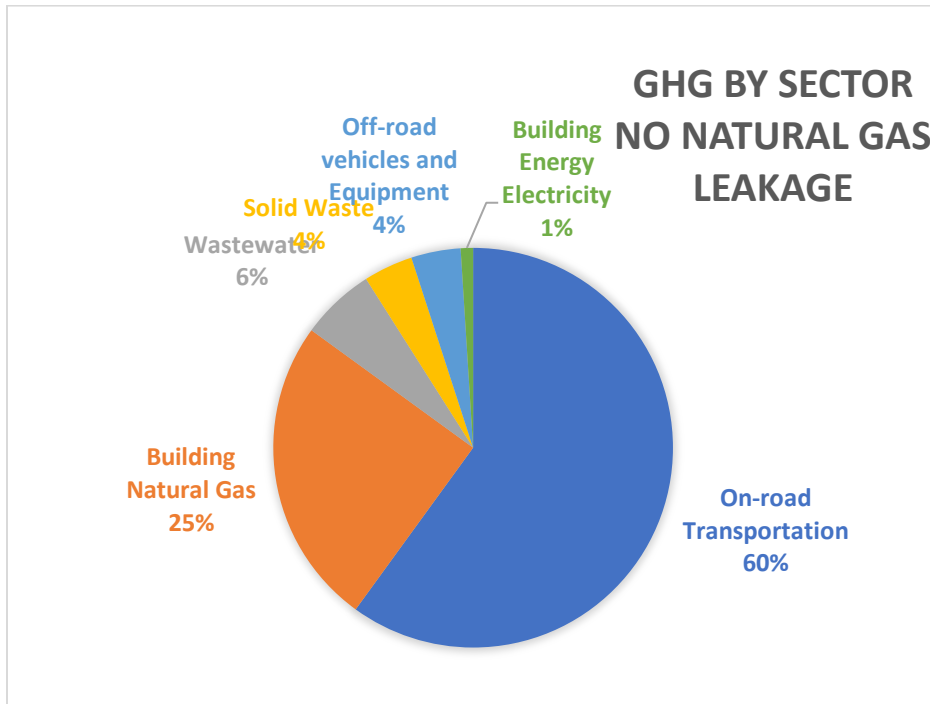
<sup>5</sup> Slides presented in October 2021 on CAP

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As following figures show, with this correction, that building-associated emissions are essentially equal to that from transportation. Appendix A has the detailed calculations.



Reproduction of Figure ES 1 (different colors)

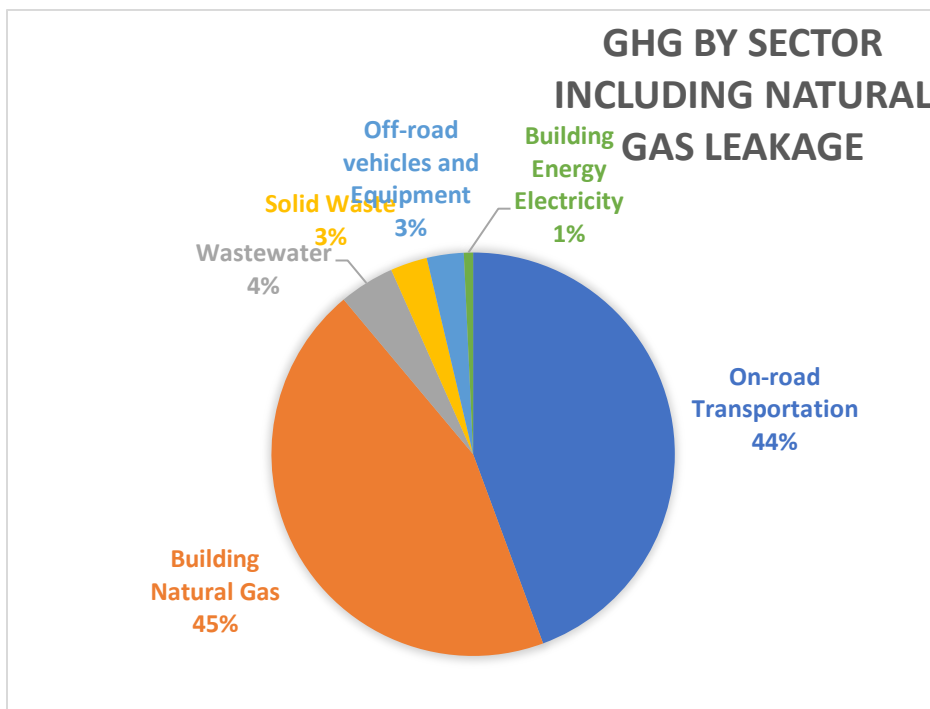


Figure 1 Calculation of Sector Emissions including the effects of Natural Gas Leakage

Comments on Draft Climate Action Plan (CAP, April 2022)  
by Gary Latshaw, Cupertino Resident  
May 15 2022

Specific Comments:

1. Elimination of Natural Gas Consumption in the City Boundaries – **End of Gas Flow**
  - a. The City shall pass an **ordinance** specifying when there will be NO natural gas available within the City Boundaries by 2040. This is commonly referred to as “**End of Gas Flow.**” Los Altos Hills, Half Moon Bay, and Ithaca, NY have adopted this approach.
  - b. The climate impact differences between the use of biogas and natural gas is uncertain. To error on the side of public safety, biogas consumption should be considered equal to natural gas consumption. As has been pointed out leakage causes the methane to be ranked as a very dangerous greenhouse pollutant. This is valid whether the source of methane is from fossil fuels or methane bio-generator. This will require revising the emissions associated with Apple’s natural gas consumption for their Bloom cells. It is currently rated as zero.
2. Municipal Buildings, Vehicles, and Equipment
  - a. A schedule shall be developed that identifies ALL the municipal buildings and the date by which they are either replaced or retrofitted to operate strictly on electricity, which can be obtained from carbon-free sources.
  - b. A schedule shall be developed that identifies all vehicles and motorized equipment and the date by which they will be replaced by electric vehicles or equipments.
  - c. All suitable municipal building rooftops must have solar panels by 2027.
3. Residences, Commercial and Industrial Buildings
  - a. The City shall require by **ordinance** that upon transfer of ownership, the building must be converted to all-electric. The **ordinance** would require that water heating, air heating, cooling, and cooking heating be powered by electricity. Additionally, the electrical system of the building should have the capacity to support electric charging. This is obviously a major step and I have elaborated on this point in Appendix B.
  - b. The City shall require by **ordinance** that upon transfer of ownership, the building must be equipped with solar panels commensurate to the practical limitation of its

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size and solar access. This regulation will require extensive research to ensure that no one in the City is seriously affected by the **End of Gas Flow** requirement.

- c. The City shall work with buildings not in compliance with the all-electric requirement by 2035 to ensure that the **End of Gas Flow** objective can be met.

This regulation will require extensive research to ensure that no one in the City is seriously affected by the **End of Gas Flow** requirement.

- 4. The City shall provide the funding and **ordinances** to ensure that condominiums and apartment buildings have Charging Stations for at least half the parking spaces by 2030. The charging station electric conduits should be capable of providing one megawatt of power. Currently, the cars that can charge fast – such as a Porsche – can utilize several hundred-kilowatt connections, but future improvements will need to be accommodated.
- 5. Adaptation –The accumulated greenhouse gases in the atmosphere have caused serious changes in the climate already. Although the CAP does call for some measures to address this, I believe a special facility that can accommodate thousand might be needed. Also, extreme heatwaves can be expected along with high levels of particulates due to wildfires. To protect its residents must invest in facilities to address extreme climate events. This should include:
  - a. Construct a special facility to address extreme heat waves. This is particularly relevant to the environmental justice community. This could be addressed by examining and perhaps modifying existing facilities. The facilities should provide for cooling, water, and perhaps shelter during the night. The facilities might be temporary shelters that could be setup during an intense heatwave. Climate-change induced heating produces warm nights making the need for air conditioning more pronounced.
  - b. Actions to address long-term particulate pollution from forest fires should be developed. Perhaps the facilities for heat waves could be double-purposed. The two threats (heat and pollution) are likely to occur together.
  - c. Medical emergency facilities should have plans to address those affected by heat and polluted air.
  - d. Water shortages are also a likely result of climate change. For example, the Lake Mead is lower than it has been in nearly a century. The Federal Government has

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reduced water supplies to several states. Phoenix has been in drought conditions since 1994. Emergency measures should be developed to reduce water demands.

6. The City must provide a statement to the public on its progress in making the goals identified above. Such a statement should specify:
  - a. Natural Gas consumption
  - b. Status of Electrification of Municipal Buildings, Vehicles, and Equipment
  - c. Status of any properties that have had new ownership during the past year.
  - d. Natural Gas Consumption in the City broken down by segments (residential, commercial, industrial, and municipal)
7. The CAP should also specify the near-term tangible benefits.
  - a. Indoor use of natural gas has been linked to causing asthma and other respiratory illnesses. So discontinuing natural gas cooking will lead to improved health.
  - b. Electrified buildings, particularly those with solar panels, have lower operational costs.
  - c. Assuming our neighboring communities also convert to electric vehicles, the air quality (exclusive of wildfire pollution) will improve remarkably as half the smog is due to vehicular emissions. The leaking methane, which will be eliminated, also contributes to the formation of ozone. As noted in the CAP, Cupertino has experienced many days when the ozone or particulate standard were exceeded.

## Appendix A – Explanation of Methane Leakage Calculations

The GHG emission factors used do not account for the serious leakage of natural gas associated with natural gas combustion. The emission factors used in the CAP appear to be based on the simple assumption that each molecule of methane (the primary component of natural gas) combusts and forms one molecule of carbon dioxide and two molecules of water. Under based on the simple assumptions.

Unfortunately, there is substantial leakage associated with the use of natural gas and that leakage has not been accounted for in the emission factor used in the Draft CAP. The various sources of leakage are shown in the Figure 2 below.

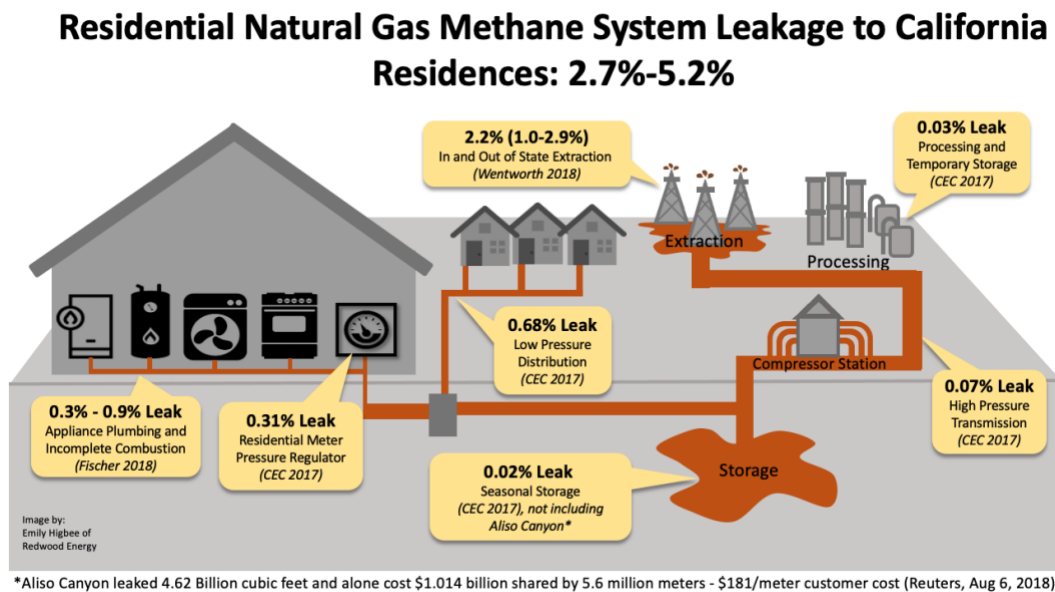


Figure 2 – Diagram of leakage from various sources in a building and exterior to the building from the supply and processing infrastructure. <sup>6</sup> The origin of the values are from Navigant, Redwood Energy, CPUC, PG&E, CED, Wintworth, and CEC.

<sup>6</sup> Slides produced by Redwood Energy

## Appendix A – Explanation of Methane Leakage Calculations

The San Francisco produced a study<sup>7</sup> of natural gas leakage in 2017. Here is a table from that report:

**TABLE 1: LITERATURE REVIEW ON METHANE LEAKS FROM NATURAL GAS SYSTEMS**

Study	Percent Leak	Min Leak	Max Leak	Production Type	Analysis Type	Year
EPA GHGI* <sup>i</sup>	1.37%	1.11%	1.78%	All production	Bottom-Up	2014
Brandt* <sup>ii</sup>	2.35%	1.96%	2.75%	All production	Top-Down	2014
Miller* <sup>iii</sup>	3.57%	2.74%	4.40%	All production	Top-Down	2013
Caulton et al <sup>iv</sup>	7.00%	2.30%	11.70%	All production	Lit Review	2014
Burnham <sup>v</sup>	2.75%	0.97%	5.47%	Conventional	Lit Review	2011
Howarth <sup>vi</sup>	3.80%	1.70%	6.00%	Conventional	Lit Review	2011
Burnham <sup>vii</sup>	2.01%	0.71%	5.23%	Shale	Lit Review	2011
Howarth <sup>viii</sup>	5.80%	3.60%	7.90%	Shale	Lit Review	2011
Howarth <sup>ix</sup>	12.00%	4.30%*	19.70%*	Shale	Lit Review	2015
<b>Averages</b>	<b>4.52%</b>	<b>2.15%</b>	<b>7.21%</b>			

\*Additional data points were estimated by the San Francisco Department of the Environment

Figure 3 – Screen Grab from referenced study

As seen in the table, the leakage estimates, and measurements vary substantially among the various investigations. For further calculations, we will use the average value of 4.52%.

Incorporating the consequences of leakage into the CAP building GHG emissions causes the amount originally associated with the emissions to increase by a factor of 2.41. Although the percent of leakage is 4.52%, methane has a very large global warming potential of 86 over a 20-year period according to the IPCC Third Assessment Report. Since we are dealing with an even shorter period ~ 10 years, this value is reasonable. Incorporating the effects of leakage result in the charts<sup>8</sup> in Figure 1.

<sup>7</sup> Wentworth, Naomi, et al, *Methane Math: How Cities can Rethink Emissions from Natural Gas*, Prepared by San Francisco Department of the Environment, November 2017

<sup>8</sup> If we assume that 4.52% of the natural gas in one therm leaks, this will imply that a multiplier must be incorporated in the GFG emission factor

1. Mass of CO<sub>2</sub> from combusting 100cf (2.83X10<sup>3</sup> liters) is 126 moles. One therm is about 100cf. The atomic weight of CO<sub>2</sub> is 44.01. Multiply 44.01 by the number of moles is 5.54x10<sup>3</sup> grams.

2. GWP = 5.54X10<sup>3</sup> X 1 = 5.54X10<sup>3</sup>. The Greenhouse Warming Potential of CO<sub>2</sub> is 1.

3. If 4.52% leak is associated with this therm of CH<sub>4</sub>, then 4.52% of the methane will be released: 0.0452 x 126x16 = 9.11x10<sup>1</sup>grams. The atomic weight of CH<sub>4</sub> is 16.



## Appendix A – Explanation of Methane Leakage Calculations

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4. From Google/IPCC: Methane has a potential of 25 over 100 years ( $\text{GWP}_{100} = 25$ ) but 86 over 20 years ( **$\text{GWP}_{20} = 86$** ); (IPCC Third Assessment Report). So the GWP is

$$9.11 \times 10^1 \times 86 = 7.83 \times 10^3$$

**$7.83 \times 10^3 / 5.54 \times 10^3 = 1.41$  or  $2.41$  times the warming impact of the combusted CH<sub>4</sub>.**

## **Appendix B – End of Gas Flow**

End of Flow requirements are clearly difficult to implement. Unfortunately, the physics and science of climate change requires that we do so to transition to a planet that can maintain a substantial population of people. Too much of this dangerous climate pollutant, methane, escapes into the atmosphere that we can ignore the existential threat to humanity by continuing to use it in such large quantities.

The City shall form a special task force to examine this issue and recommend to the City Council in 2023 an action plan. The effort should incorporate representatives from the community, academia, and firms dedicated to the objective of decarbonization.

**From:** [Dashiell Leeds](#)  
**To:** [Andre Duurvoort](#); [Victoria Morin](#); [Gilee Corral](#)  
**Cc:** [City Clerk](#); [Cupertino City Manager's Office](#); [Katja Irvin](#); [Kristel Wickham](#); [James Eggers](#); [Barbara Kelsey](#)  
**Subject:** SCLP letter to Cupertino regarding the CAP update  
**Date:** Sunday, May 15, 2022 12:49:52 PM  
**Attachments:** [SCLP Letter To Cupertino regarding CAP update 2022.05.15.pdf](#)

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Dear Cupertino City Staff and Consultants,

The Sierra Club Loma Prieta Chapter is in strong support of Cupertino's Climate Action Plan Update. We support the strong building electrification measures contained in the CAP and the equity and outreach-based approach. We also support the City's emphasis on natural infrastructure solutions to mitigate the impacts of climate change to the community.

Please read the attached letter for our full list of recommendations.

Sincerely,

Katja Irvin  
Co-Chair, Water Committee  
Sierra Club Loma Prieta Chapter

Kristel Wickham  
Co-Chair, Climate Action Leadership Team  
Sierra Club Loma Prieta Chapter

Dashiell Leeds  
Conservation Organizer  
Sierra Club Loma Prieta Chapter



# SIERRA CLUB

## LOMA PRIETA CHAPTER

SAN MATEO, SANTA CLARA & SAN BENITO COUNTIES

May 15<sup>th</sup>, 2022

Cupertino City Hall  
10300 Torre Ave,  
Cupertino, CA 95014

RE: Draft Climate Action Plan Update

Dear Cupertino Staff and Consultants working on the Climate Action Plan Update,

The Sierra Club Loma Prieta Chapter is in strong support of Cupertino's Climate Action Plan Update. The ICLEI numbers are likely underestimating the amount of fugitive emissions, making the decarbonization of buildings even more important than the figures imply. We support the strong building electrification measures contained in the CAP and the equity and outreach-based approach. We also support the City's emphasis on natural infrastructure solutions to mitigate the impacts of climate change to the community. We hope that you consider the following suggestions while making revisions to the Draft Climate Action Plan.

### **Please Update BE-4 to include a standalone municipal ordinance**

As Cupertino updates its Reach Code, it should consider transitioning these requirements into a standalone municipal ordinance existing outside of Title 24, as cities like San Jose and Morgan Hill have done. These requirements would exist outside of the 3-year code cycle and would not need to be re-evaluated during each adoption of the building code.

### **Increase Measure WW-1 target to 20%**

The CAP includes measure WW-1 to "Reduce per capita water consumption 15% compared to 2019 levels by 2030 and maintain through 2040." This is now the immediate goal under a water shortage emergency declared by Valley Water in June 2021. Therefore, it seems this goal can be increased, perhaps to 20%.

### **Develop Annual Water Conservation Performance Indicators**

The water conservation and local supply measures in the CAP are mostly actions being led by Valley Water and it's unclear what Cupertino is planning to do to expedite these actions (installation of conservation devices, brackish water desalination, etc.). At least, the CAP should include an additional measure to develop performance indicators and evaluate progress towards reaching those performance goals on an annual basis, with commitment to ramp up efforts if goals are not met.

### **Change action WW1.2 to include updating the ordinance code to implement Valley Water's Model Water Efficient New Development Ordinance (MWENDO). The following elements of MWENDO should be considered immediately:**

- for single family development, require compact hot water distribution systems with volume limit,
- Graywater Dual Drainage Plumbing with valves and stub-outs near landscaping; this action is already in the CAP but should be moved to Phase 1 rather than Phase 2,

- require homeowner's associations that manage shared landscaping to use purple pipe water if available within 200 feet; it must be purple pipe ready if recycled water is planned to be available in the next 10 years,
- require pool covers,
- for multi-family and nonresidential uses, require faucet locks for publicly accessible exterior faucets and hose bibs,
- require submeters for any unit projected to consume more than 100 gal/day,
- for larger buildings, require dual plumbing systems to facilitate and maximize the use of Alternate Water Sources,
- require manually operated toilets and faucets (except in hospitals), and
- Cupertino should follow San Jose and update the Water Efficient Landscape Ordinance to ban non-functional turf; please note that this element was not included in the MWENDO but jurisdictions throughout the western states are adopting this restriction.

As an alternative to MWENDO, require new development to be water neutral. The most important part of this action would be to work with Valley Water and other local jurisdictions to develop a program for water offsets for new development within Santa Clara County.

**We encourage the following additional measures or actions to reduce energy use and associated emissions by reducing water use and increasing local water supplies:**

- increase use of recycled water, either by connection to purple pipes or through a program to encourage on-site or district scale recycling and stormwater capture (water micro-grids),
- along with action WW 1.4 to "Work with schools to educate youth about water conservation," include an action to work with schools to convert non-functional turf to native pollinator gardens. Youth could get involved in hands-on projects as part of this effort, and
- elevate the priority to install advanced metering infrastructure; action WW 1.6 to "Work with Santa Clara Valley Water and Cupertino's water retailers to provide Wi-Fi connected meters that citizens can check on phones and computers" is currently a Phase 3 action; this is one of the more innovative water conservation actions included in the CAP so we recommend this be a Phase 1 or Phase 2 action.

**Add Cupertino's All-Electric Reach Code to the Climate Action History of the City**

Cupertino's reach code is not present in Cupertino's climate action history timeline, and should be added. Cupertino has an excellent reach code that has inspired many cities to take strong action in the 2020 code cycle. Thank you for creating such a strong code, and we hope you celebrate it in this section of the Climate Action Plan.

**Consider setting an end of flow date by 2040 or sooner to correspond with the City's GHG reduction goals**

As Cupertino continues its transition away from fossil fuels, it should consider establishing an end-of-flow date for the citywide retirement of natural gas infrastructure. An end-of-flow date could send a strong market signal to Cupertino residents that gas appliances are on their way out, which could encourage more residents to purchase electric appliances upon replacement. This could reduce the number of future retrofits in Cupertino and encourage other jurisdictions to consider end-of-flow announcements.

### **Seek to Transition Away from Methane Gas Fuel Cells Entirely**

Apple facilities are identified in BE 5.1 as a significant source of energy consumption in the City. We ask that Cupertino help Apple explore solutions to transition away from fuel cells entirely and explore other green energy backup solutions. For future commercial projects, new gas fuel cells should not be permitted to be installed.

### **Pollinator Corridors should be coordinated across relevant measures, such as TR-1, CS1.2, and the Urban Forest Management Plan**

The Urban Forest Management Plan provides an opportunity for Cupertino to coordinate its tree-planting efforts with other planning efforts such as Measure TR-1 (Develop and Implement and Active Transportation Plan). The City's pedestrian and bicycle infrastructure should be designed with canopy cover and habitat linkages in mind. Pollinator corridors can be used to allow habitat connectivity throughout the city. For reference, please see the Green Corridor<sup>1</sup> and Urban Habitat Guidelines<sup>2</sup> created by our Chapter's Sustainable Land Use Committee.

We hope you consider our suggestions. Thank you for your work on this Climate Action Plan Update.

Sincerely,



Katja Irvin  
Chair, Water Committee  
Sierra Club Loma Prieta Chapter



Kristel Wickham  
Co-Chair, Climate Action Leadership Team  
Sierra Club Loma Prieta Chapter



Dashiell Leeds  
Conservation Organizer  
Sierra Club Loma Prieta Chapter

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<sup>1</sup> [Guidelines for Master Planning a Sustainable Green Streets Network](#)

<sup>2</sup> [Checklist For Urban Habitat Guidelines](#)

**From:** [Xinpei Lu](#)  
**To:** [City of Cupertino Sustainability Commission](#)  
**Subject:** Public Comment  
**Date:** Friday, May 20, 2022 3:59:32 AM

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Hello commission, my name is Xinpei Lu, and I am a student from Cupertino High School. For my final Capstone project in Chemistry, I have chosen to speak up about the issues of our current urban planning and what sustainable urban planning could look like and make an impact by speaking to the City of Cupertino about this issue.

I am passionate about this issue because urban planning influences the culture, economy, transportation, demographic, and more of our daily lives, and while efforts have been made to make Cupertino more sustainable, it is still not enough to make this city truly sustainable from an sustainable urban planning perspective. Public transportation is still not accessible and convenient, parts of the bike lanes feel dangerous from my personal experience, there's still a heavy use of cars, sidewalks have cracks or are bent, and accessing services is difficult without cars. I have made a presentation to show the problems with and some potential solutions to our current urban planning. I have also read the Climate Action Plan 2.0, and I have spoken to Mayor Darcy Paul about this issue during the Mayor's Cup Challenge: Plastics and Sustainability. In my opinion, sustainable urban planning must be implemented even more since Cupertino is leading the effort to reduce greenhouse gases emissions and mitigate climate change impacts. If Cupertino can implement sustainable urban planning as much as possible, this will serve as inspiration to other cities across the globe, especially since Cupertino is where the headquarter of Apple is located.

Thank you for your time,  
Xinpei Lu



Urban Planning