Green Building Reach Code Community Workshop

October 16, 2019

City of Cupertino
Sustainability Commission

Agenda

6:00pm	Welcome	**Councilmember Rod Sinks**
6:10pm	Introduction	**Meera Ramanathan & Vignesh Swaminathan**, Reach Code Subcommittee Co-Chairs
6:25pm	Climate Action + Reach Code Background	**Andre Duurvoort**, Sustainability Manager
6:45pm	Green Building + Reach Code Opportunities	**Walker Wells**, Raimi + Associates
7:15pm	Tabletop Discussions + Report Out	
8:00pm	Closing + Next Steps	**Andre Duurvoort**, Sustainability Manager

Welcome!

Considerations for Today

What is important for our environmental and climate action goals?

What are the financial/safety/environmental benefits and who realizes them?

What is the scope and applicability of the reach code?

How does this reach code impact construction and consumer costs?

Climate Action + Background

Why is a reach code right for Cupertino?

CITY OF CUPERTINO

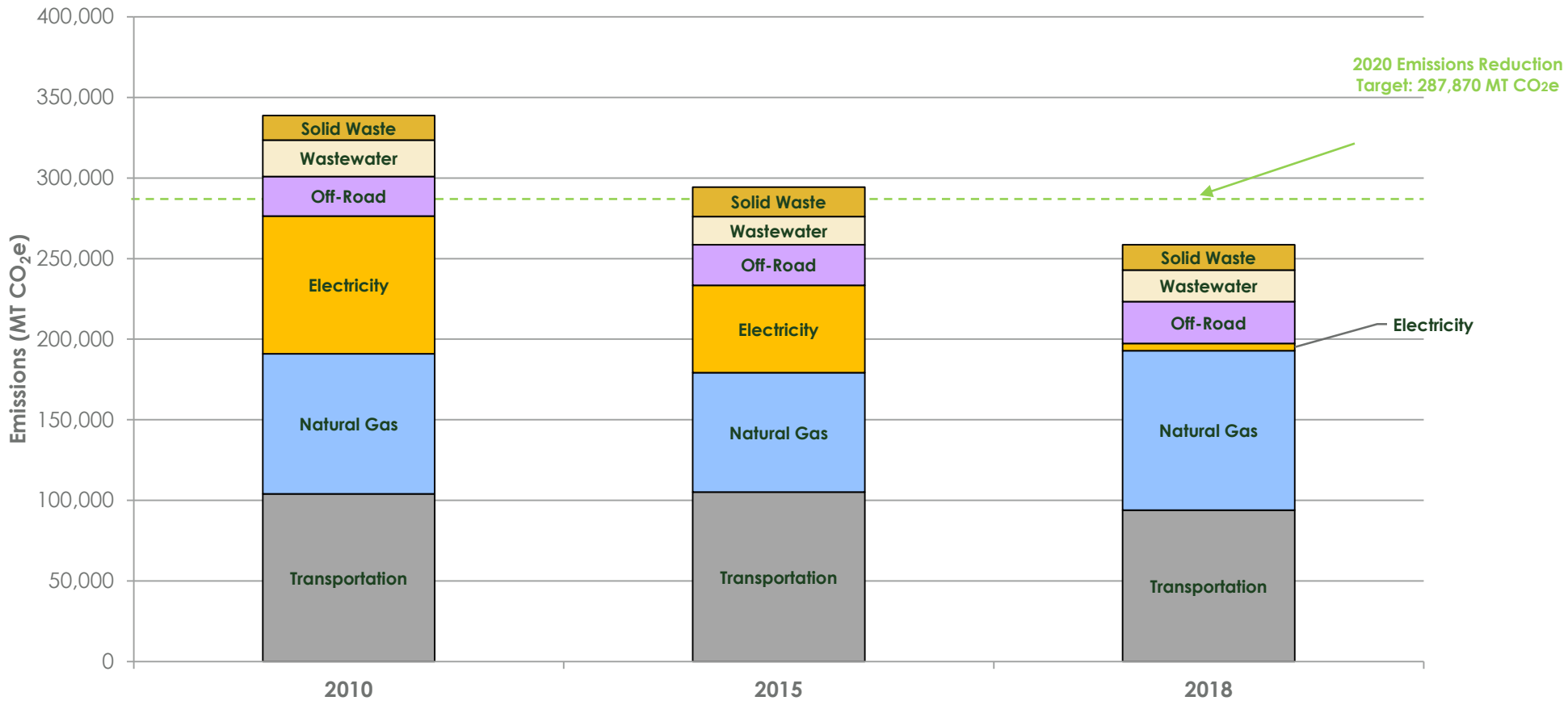
Green/electrification reach codes

- **Why:** Part of the Sustainability Commission work program
- **Scope:** new construction at time of building permit application
- **Questions:**
  - How can the reach code best support the Climate Action Plan?
  - How to best mitigate climate impact of development for next 3 years

What is a local reach code?

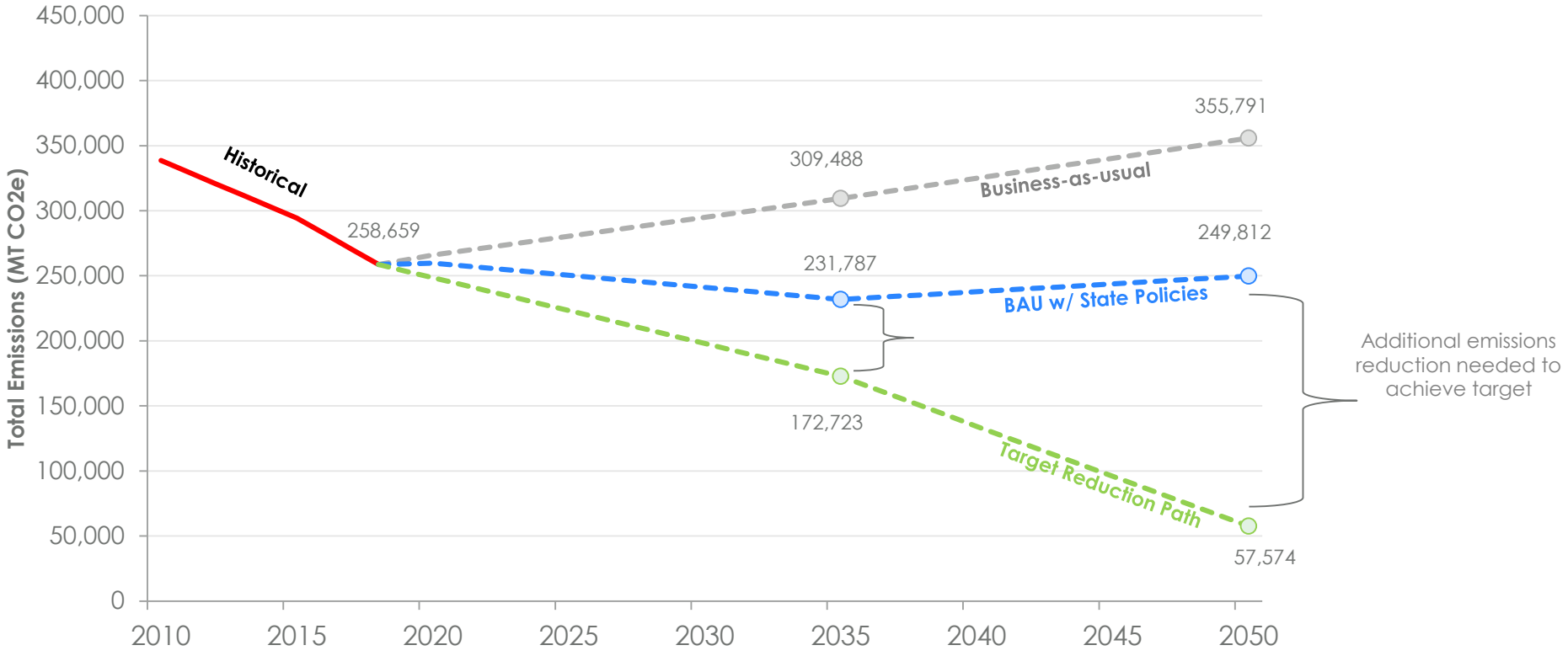
- "Reach" beyond the base building code
- Support community priorities (CAP)
- Includes additional requirements, such as:
  - Energy/water efficiency
  - Electric vs. fossil fuels
  - EV charging infrastructure
  - Solar PV
  - Construction waste management

Cupertino community emissions rate (draft)



- Total emissions decreased 24% since 2010
- Electricity emissions decreased 95% since 2010
- Natural gas and transportation growing as percentage of total emissions

Cupertino community emissions forecast



- As of 2018, emissions are 24% below 2010 levels and the 2020 target has been achieved
- Emissions with State policies are projected to be 32% / 26% below 2010 by 2035/2050
- **Additional emissions reductions will be needed to achieve Cupertino's 2035 and 2050 targets** (49% / 83% below 2010)

Statewide Reach Codes

San Jose
Electric Preferred

Menlo Park
All-Electric + Solar PV

Berkeley
Natural Gas Ban

Green Building + Reach Code Opportunities

raimi + associates

Walker Wells

Green Building Trends

State Climate Goals

- SB 350 – Double energy efficiency for natural gas and electricity use
- AB 802 – Building energy use benchmarking and disclosure
- AB 3232 – Requires the CEC to create a plan by 2021 to reduce building sector emissions by 40% below 1990 levels by 2030
- Health and equity co-benefits

2019 Reach Code Trends

- Solar installations
- All-electric buildings
- Increased energy and water efficiency

2022 Code Cycle

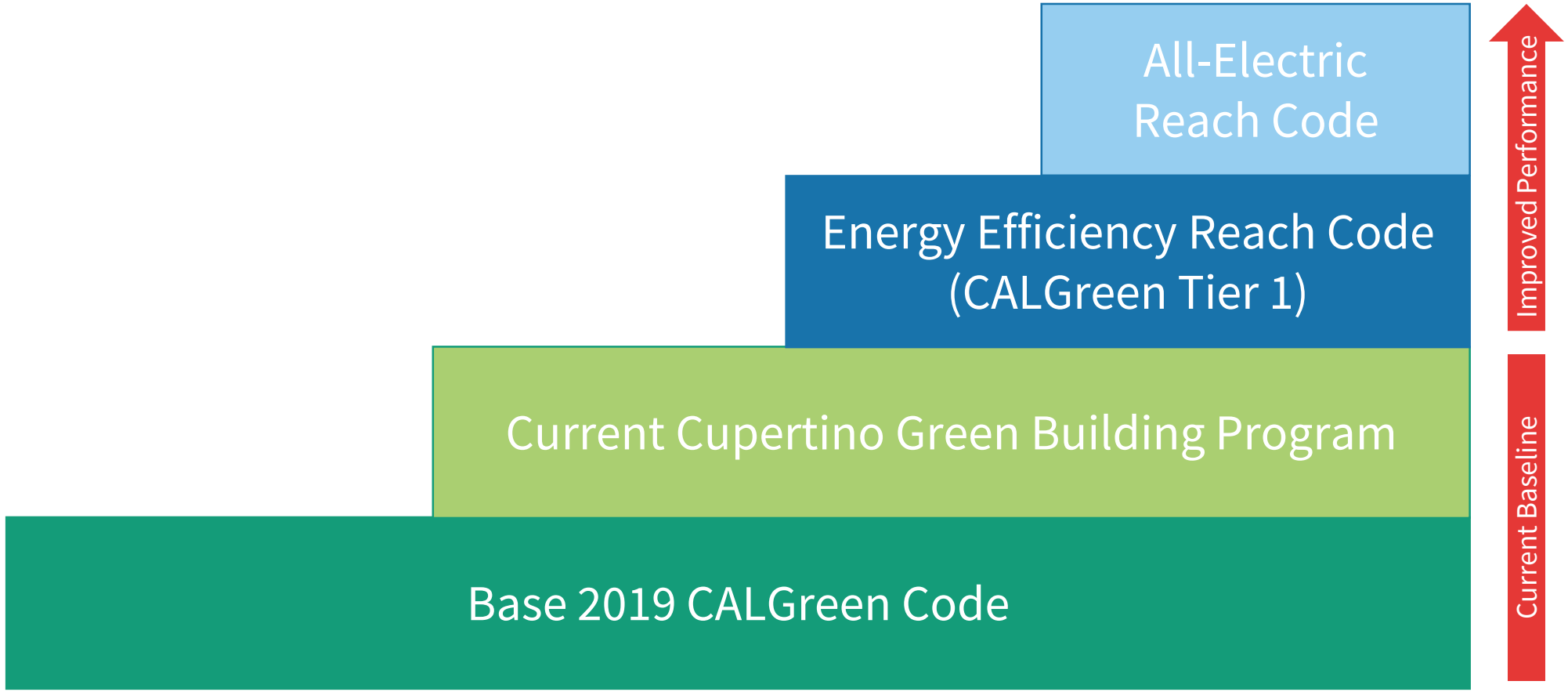
- ZNE standard for buildings
- All-Electric Buildings

2030 Long-Range Goal of Net Zero for all Buildings

California Emissions Reduction Goals
(from 1990 levels)

***40%** by 2030*
***80%** by 2050*

Green Building Potential



Cupertino's Green Building Program

New Construction

Project Type	Minimum Green Building Requirement	Required Verification
Residential		
Single Family and Multi-family homes equal to or less than 9 homes	CALGreen Building Code in accordance with CALGreen's minimum thresholds	City Review
Single Family and Multi-family homes equal to or greater than 9 homes	• GPR certified at min. 50 pts or • LEED Silver • Alternate Reference Standard per Section 101.10.2	• Third Party GPR or LEED certification as applicable • Alternate Reference Standard
Nonresidential		
Small: less than 25,000 SF	CALGreen Building Code	City Review
Mid-size: 25,000-50,000 SF	• LEED Certified or • Alternate Reference Standard per Section 101.10.2	• Third Party GPR or LEED certification as applicable • Alternate Reference Standard
Large: greater than 50,000 SF	• LEED Silver or • Alternate Reference Standard per Section 101.10.2	• Third Party GPR or LEED certification as applicable • Alternate Reference Standard

Proposed Reach Code Requirements

Residential New Construction

Energy

Mixed Fuel Buildings

Prepare for future conversion of gas appliances to electric:

1. Electric-Ready Water Heating
2. Electric-Ready Space Heating
3. Electric-Ready Cooktop
4. Electric Ready Clothes Drying

Performance approach compliance:

All-Electric buildings meet code.

1. Energy Efficiency Design Rating of Proposed Design Building is no greater than that of the Standard Design Building
2. Total Energy Design Rating for Proposed Design Building is 10 points less than that of the Standard Design Building
3. Mixed-fuel buildings may not follow the prescriptive compliance approach
4. Certificate of Compliance must be completed by a Certified Energy Analyst (CEA) for all buildings

All-Electric buildings meet code.

CALGreen Tier 2

All Buildings

A4.1 Planning and Design

1. Topsoil protection and reuse (A4.106.2.3)
2. 30% of total parking, walking, or patio surfaces shall be permeable (A4.106.4)
3. Cool Roof (A.106.5)
4. Select **4** Elective Measures

A4.3 Water Efficiency and Conservation

1. Plumbing fixtures and fittings shall comply with (A4.303.1)
2. Metering faucets shall not deliver more than **0.2 gallons per cycle** (A4.303.1.4.3)
3. Developments shall comply with Cupertino's Water Efficient Landscape Ordinance (MWELO)
4. Select **3** Elective Measures

A4.4 Material Conservation and Resource Efficiency

1. **25%** cement foundation mix design reduction (fly ash, slag, etc.) (A4.403.2)
2. **15%** Recycled Content Value (RCV) (A4.405.3)
3. **75%** diversion of C&D debris (A4.408.1)
4. Select **4** Elective Measures

A4.5 Environmental Quality

1. **100%** of resilient flooring shall be low VOC (A4.504.2)
2. Thermal insulation shall be low VOC and have no-added formaldehyde (NAF) (A4.504.3)
3. Select **1** Elective Measure

Proposed Reach Code Requirements

Nonresidential New Construction

Energy

Mixed Fuel Buildings

Prepare for future conversion of gas appliances to electric:

1. Electric-Ready Water Heating
2. Electric-Ready Space Heating
3. Electric-Ready Cooktop
4. Electric Ready Clothes Drying

Performance approach compliance:

1. Energy Compliance Margins:

Occupancy Type	Compliance Margins
Office Building	10%
Retail	10%
Hotel/motel and High-rise Residential	5%
Industrial/Manufacturing	0%
All other Nonresidential Occupancies	5%

2. Mixed-fuel buildings may not follow the prescriptive compliance approach
3. Certificate of Compliance must be completed by a Certified Energy Analyst (CEA) for all buildings

All-Electric buildings meet code.

CALGreen Tier 2

All Buildings

A5.1 Planning and Design

1. **12%** total spaces for fuel-efficient vehicles (A5.106.5)
2. Cool Roof (A.106.5)
3. Select **3** Elective Measures (out of 11)

A5.3 Water Efficiency and Conservation

1. **20%** reduction in baseline water use (A5.303.2.3)
2. Select **3** Elective Measures (out of 10)

A5.4 Material Conservation and Resource Efficiency

1. **15%** Recycled Content Value (RCV) (A5.405.4)
2. **80%** diversion of C&D debris (A5.408.3)
3. Select **3** Elective Measures (out of 14)

A5.5 Environmental Quality

1. **100%** of resilient flooring shall be low VOC and FloorScore or GREENGUARD certified (A5.504.4.7.1)
2. Thermal insulation shall be low VOC and have no-added formaldehyde (NAF) (A5.504.4.8.1)
3. Select **3** Elective Measures (out of 15)

Cost Effectiveness of Increased Energy Efficiency

CEC Cost Effectiveness = Measure pays for itself in savings over the course of its lifetime.

CALGreen Tiers 1 + 2 determined to be cost-effective as part of 2019 California Building Standards Code adoption process.

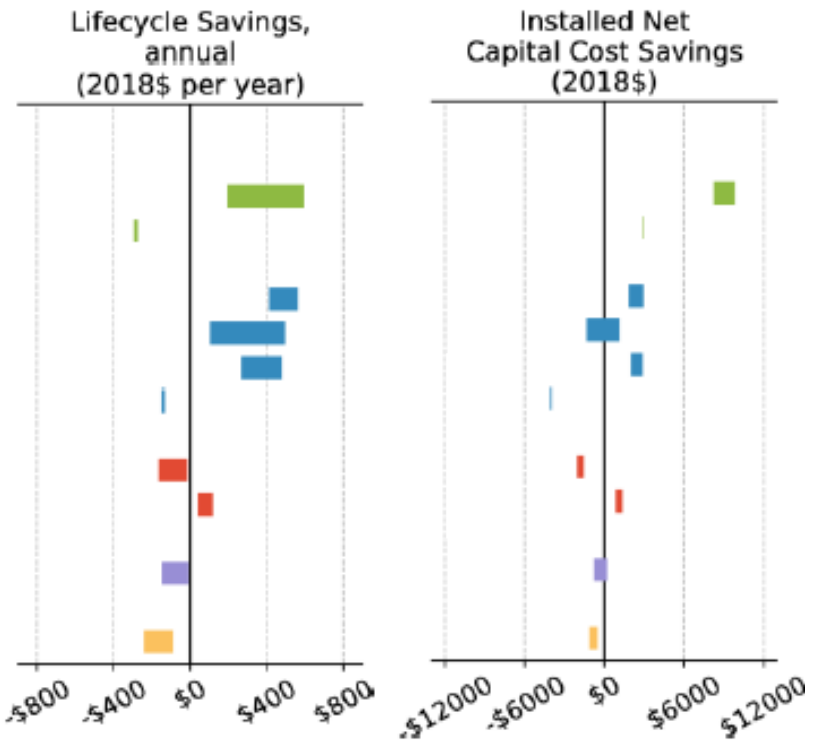
Based on modeling using State-approved compliance software, all new construction in Cupertino is **projected to meet a Tier 1 energy reach code** by including a combination of building envelope and/or systems measures.

Building Envelope	Building Systems
Window Glazing	HVAC
Roof Insulation	Pumps + Fans
Wall Insulation	Hot Water Heater
Window Overhang	Lighting

Residential Electrification Cost Considerations

Avg. Capital cost savings: $3,000-$10,000/dwelling unit
Avg. Lifecycle Savings: $330/year

Single Family



Entire home
- All-electric (new construction w/ AC in baseline)
- All-electric (new construction, no AC in baseline, CZ3)

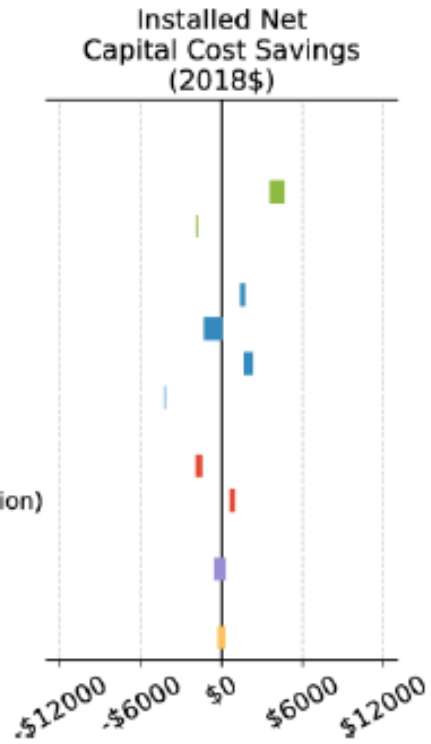
HVAC
- Packaged terminal heat pump (retrofit)
- Ducted heat pump (retrofit)
- Mini-split (new construction w/ AC in baseline)
- Mini-split (new construction, no AC in baseline, CZ3)

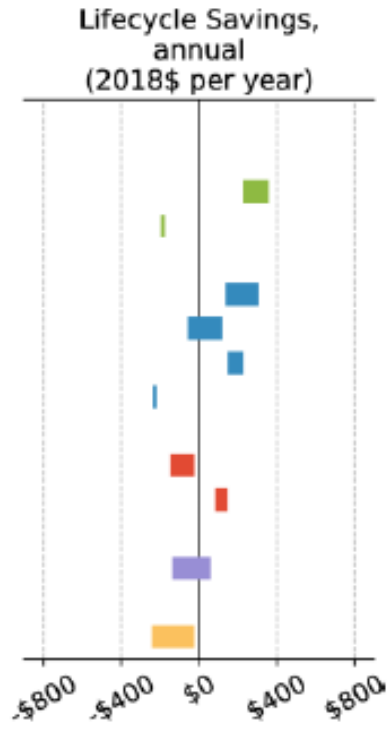
Water heater
- Heat pump water heater vs. gas storage (retrofit)
- Heat pump water heater vs. tankless gas (new construction)

Range/Oven
- Electric resistance

Clothes dryer
- Electric resistance dryer

Low-Rise Multi-Family





Source: E3 Residential Building Electrification in California

Nonresidential Electrification Cost Considerations

For nonresidential new construction:

Incremental cost of all-electric design with energy efficiency measures and federal minimum appliance efficiencies.

Savings are likely the result of not installing natural gas service.

	Medium Office	Medium Retail	Small Hotel
Incremental Cost Savings	$2,363	$17,327	$1,263,932

Source: CEC 2019 Nonresidential New Construction Reach Code Cost Effectiveness Study

Tabletop Discussion Topics

1. Single Family Home – New Construction & Remodel
2. High-Rise Mixed-Use New Construction
3. Office & Hotel New Construction
4. Electric Vehicle Readiness
5. City Processes – Outreach, Verification, Incentives

Next Steps

- Public outreach event – October 16
- Publish draft ordinance – Late October
- Stakeholder outreach – ongoing
- Sustainability division staff report – TBD
- 1st Council reading – November 19th
- 2nd Council reading – December 3rd
- Implementation begins – early 2020


GREEN BUILDING
For a Healthy and Sustainable Community
Why Build Green?
SAVE MONEY
BE HEALTHY
LIVE COMFORTABLY
REDUCE MAINTENANCE
PROTECT THE ENVIRONMENT
ABOUT THE DISPLAY
KEY TO ENVIRONMENTAL BENEFITS
When Building, Consider...
Whole house fan
House wrap
FSC certified wood
Recycled-content/ natural fiber carpet and underlayment
Oriented strand board in subfloor
Compact fluorescent lightbulbs
Low/no-VOC paint or natural plaster
Fiber cement siding

Questions?