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Case Studies of CCA and REN Zero Net Energy/Carbon Programs

CPUC Evaluation of the Group B Sectors, Deliverable 33
IOU and CCA Cross-Cutting Program Evaluation

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Peninsula Clean Energy and Silicon Valley Clean Energy Joint Reach Code Initiative

- In 2018 Peninsula Clean Energy and Silicon Valley Clean Energy undertook a joint electrification reach code initiative across their combined service territories.
- As a result, 16 cities in San Mateo and Santa Clara counties enact electrification reach codes exceeding California's Title 24 statewide building energy efficiency and green building standards by encouraging or requiring all electric appliances in buildings, prohibiting natural gas end uses, and specifying enhanced requirements for electric vehicle charging.
- This *en masse* reach code initiative represents half (16/32) of all cities and counties adopting building electrification reach codes across the State of California.

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Five Main Deliverables

- Model reach codes for building electrification and electric vehicle charging
- Grant funding to local governments to consider the codes
- One-on-one technical assistance for local governments and developers
- Tools, time, and expertise to support municipal adoption
- Tools, time, and expertise to support code implementation

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Roles and Responsibilities

Initiative Team Members	Roles
Peninsula Clean Energy	Regional partner, project administrator, lead electric vehicle code development, member agency outreach
Silicon Valley Clean Energy	Regional partner, lead building electrification code development, resource library and tool creation, member agency outreach
TRC	Lead consultant
DNV-GL	Technical support
San Mateo Office of Sustainability	Stakeholder facilitation and support
Joint Venture Silicon Valley	Stakeholder outreach to public & private community groups
Energy Solutions	Electric vehicle cost-effectiveness analysis

Five Phases

- **Phase 1** - Stakeholder outreach through public workshops and smaller meetings to educate and solicit feedback from different audiences
- **Phase 2** - Technical and cost-effectiveness analyses & drafting the model reach codes
- **Phase 3** - Stakeholder discussions on proposed reach code language and public education about practical implementation
- **Phase 4** – Support for city staff and elected officials to consider and pass reach codes for their jurisdiction
- **Phase 5** - Ongoing implementation support
  - Help building departments with permitting and enforcement
  - Help builders and developers with technical challenges meeting the new codes

Initiative Timeline

Date/Timeline	Primary Activity/Milestone
June to December 2018	Strategic planning and preparation
January 2019	Reach code kickoff event for city staff
February 2019	Statewide building electrification cost-effectiveness studies
March 2019	Building reach code workshops
April 2019	Draft model reach codes and measures available
April & May 2019	City-specific stakeholder engagements
May 2019	Last input into model code measures
June 2019	Model reach code language shared
June to August 2019	Outreach and adoption technical assistance
July 2019	Berkeley bans natural gas
July to October 2019	City councils vote on desired reach codes (depends on city workplan)
September 2019	Menlo Park passes all electric reach code
August to October 2019	Cities submit code packet for CEC approval
December 2019	Start of training for city staff
January 1, 2020	Reach codes to go into effect at the same time as statewide code update
2020	Ongoing training and implementation support for cities and builders
2020-2022	Opportunities to adopt reach code throughout three-year code cycle.

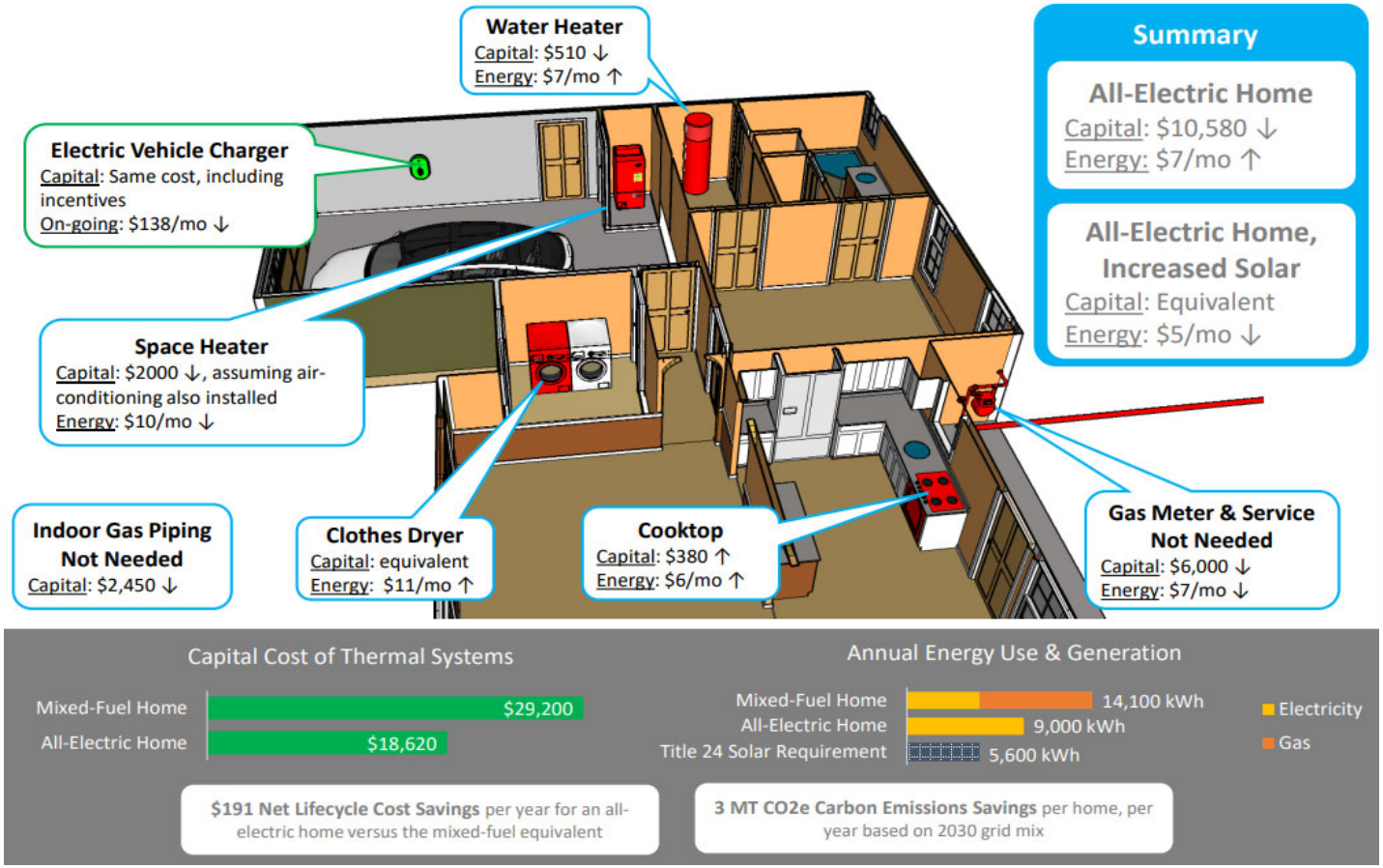
Model Code Summary

Code Element	Reach Code Summary
Building Electrification	• Provides 3 tracks for developers: all-electric, mostly electric, or mixed-fuel • All-electric (preferred) is less expensive, delivers more benefit • Mixed-fuel allows natural gas but has higher efficiency requirements • Details vary by building segment
Electric Vehicle Readiness	• Provides "plug and play" access to vehicle charging • Single family: Level 2 (dryer outlet power) and Level 1 (standard 110v outlet) • Multi-unit dwellings: one "EV Ready" space per unit* • Office: 10% Level 2, 10% Level 1, and 30% EV Capable • Other Commercial: 6% Level 2 installed and 5% Level 1 installed

Local Government Support: Online Resource Library

- Sample ordinance language and a reach code template
- Templates for staff reports, letters
- Sample submission documents for the California Energy Commission
- A PowerPoint slide library
- Sample code facts and findings
- Links to all relevant cost-effectiveness analysis and electric vehicle cost studies
- Discussion materials on carbon emissions savings and cost-effectiveness
- A 13 page frequently asked question document
- Case studies
- A flyer for homeowners
- Suggested timelines for adoption
- Building department checklists
- Online videos
- Reach code training presentations
- A set of links to external resources
- The online library can be accessed at https://peninsulareachcodes.org/#resources

Stakeholder Discussion



Initiative Results

Jurisdiction	Approach			Systems			Building Types								Add-On		CCA		Adopted	
	Natural Gas Infrastructure Moratorium	All-Electric Reach	Electric-Preferred	Whole Building	Water Heating	Space Heating	Low Rise Residential	High Rise Residential	City-Owned Properties	Hotel	Retail	Office	Restaurant	Life Sciences	Additional Solar	Electric Vehicles	Peninsula Clean Energy	Silicon Valley Clean Energy	2019	2020
Count	**1**	**12**	**4**	**10**	**7**	**7**	**16**	**13**	**13**	**12**	**12**	**13**	**11**	**5**	**4**	**12**	**6**	**10**	**13**	**3**
Brisbane		X			X	X	X	X	X	X	X	X	X			X	X		X	
Burlingame		X		X	X	X	X	X	X	X	X	X		X			X			X
Campbell		X			X	X	X									X		X		X
Cupertino		X		X			X	X	X	X	X	X	X			X		X	X	
Los Altos Hills		X			X	X	X	X	X	X	X	X	X					X	X	
Los Gatos		X		X			X									X		X	X	
Menlo Park*		X			X	X	X	X	X	X	X	X	X		X	X	X		X	
Milpitas			X	X			X	X	X	X	X	X	X	X				X	X	
Monte Sereno			X	X			X	X	X							X		X	X	
Morgan Hill	X			X			X	X	X	X	X	X	X	X				X	X	
Mountain View*		X		X			X	X	X	X	X	X	X		X	X		X	X	
Pacifica		X			X	X	X	X	X	X	X	X	X		X	X	X		X	
Palo Alto		X	X	X			X	X	X	X	X	X	X	X		X		X	X	
San Mateo			X	X			X					X			X	X	X		X	
San Mateo County		X		X			X	X	X	X	X	X	X			X	X			X
Saratoga		X			X	X	X	X	X	X	X	X	X	X		X		X	X	

Click on city name for web link to code summary.

*City council opted to go beyond staff recommendation.

Source: Building Decarbonization Coalition http://www.buildingdecarb.org/active-code-efforts.html

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Best Practices

- Encourage code innovation.
- Be flexible and open to new ideas.
- Engage with stakeholders early and often.
- Use the power of inclusion.
- Plan to iterate.
- Use the power of example.

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Lessons Learned

- Be bold.
- Comprehensive teams can provide comprehensive services.
- Plan for both public and private consultation.
- Give yourself enough time.
- Use technology to promote stakeholder collaboration and self-sufficiency.

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Appendix

Model Reach Code Comparison

Building Type	2019 CalGreen	Reach Code	
		All-Electric	Mixed-Fuel
Single-Family Two-Family Townhome	Meet Title 24 Energy Requirements using: Performance or Prescriptive	Meet Title 24 Energy Requirements using: Performance or Prescriptive	Exceed Title 24 Energy Requirements using: Performance (10 EDR points) or Prescriptive (additional measures)
	Require solar generation	Require solar generation	Require solar generation and: Solar water heating or 1.5 kWh battery
	Required adjacent outlet for future electric replacement: Gas water heaters	Use electric appliances	Required adjacent outlet for future electric replacement: Gas water heaters Gas clothes dryers Gas ranges and stoves
Multifamily	Meet Title 24 Energy Requirements using: Performance or Prescriptive	Meet Title 24 Energy Requirements using: Performance or Prescriptive	Exceed Title 24 Energy Requirements using: Performance (10 EDR points) or Prescriptive (additional measures)
	Require solar generation	Require solar generation	Require solar generation and: Solar water heating or 2.75 kWh battery
	Required adjacent outlet for future electric replacement: Gas water heaters	Use electric appliances	Required adjacent outlet for future electric replacement: Gas water heaters Gas clothes dryers Gas ranges and stoves
Nonresidential	Meet Title 24 Energy Requirements using: Performance or Prescriptive	Meet Title 24 Energy Requirements using: Performance or Prescriptive	Exceed Title 24 Energy Requirements using: Performance (9% compliance margin) Prescriptive (additional measures)
	Solar generation ready zone	Solar generation ready zone	Solar generation ready zone
	Required adjacent outlet for future electric replacement: Gas water heaters	Use electric appliances	Required adjacent outlet for future electric replacement: Gas water heaters Gas clothes dryers Gas ranges and stoves

EV Reach Code Comparison

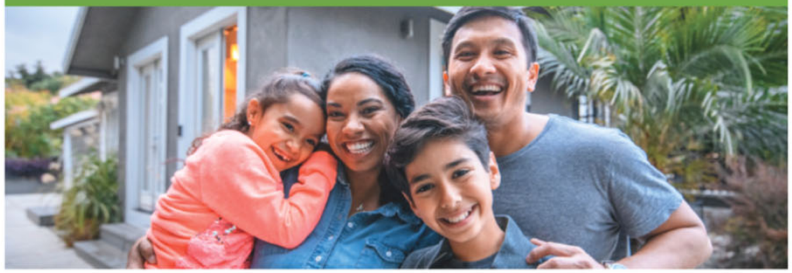
Readiness Level	2019 CalGreen*	Reach Code Initiative*
EV Capable (electrical conduit and panel space in place)	SF: 1 space L2 MF: 10% spaces L2 NR: 6% spaces L2	Offices: 30% spaces L1
EV Ready (fully wired receptacle ready for charging)	None	SF: 1 space L2 + 1 space L1 MF: 25% spaces L2 + 75% spaces L1 Office: 10% spaces L1 NR: 5% spaces L1
Electric Vehicle Charging Station (EVCS)	None	Office: 10% spaces L2 NR: 6% spaces L2
*Abbreviations: SF = single-family, MF = multifamily, NR = nonresidential, L1 = level 1, L2 = level 2		

Study Overview and Case Study Selection

Active New Construction ZNE/ Electrification Programs	Organization	Sonoma Clean Power	MCE	Silicon Valley Clean Energy	Peninsula Clean Energy	BayREN	Cape Light Compact
	Date Electric Service First Provided to Customers	2014	2010	2017	2016	2012	1997
	Service Area	Sonoma and Mendocino Counties	Marin and Napa Counties, 1 city in Solano County, unincorporated Contra Costa County and 13 cities	Unincorporated Santa Clara County and 12 cities	Unincorporated San Mateo County and 20 Cities	All 9 Bay Area Counties	21 towns on Cape Cod, Martha's Vineyard and Dukes County.
	New Construction ZNE/ Decarbonization Programs	Advanced Energy Rebuild	Advanced Energy Rebuild	All-Electric Building Design Grants, Electrification Reach Codes	Electrification Reach Codes	2019 Building Decarbonization and EV Infrastructure Reach Code Initiative	Energy Efficient New Construction Programs (Net Zero Ready New Construction Measure)
	Customer Accounts	225,000	470,000	270,000	293,000	Not Applicable	200,000
	Annual Load 2019 GWh	2,502	5,275	3,898	3,600	Not Applicable	Not Available
	Est Peak Load (MW)	450	1,050	800	644	Not Applicable	Not Available
	Minimum RPS	48	60	50	50	Not Applicable	19%

Public Outreach and Education

2019 Energy Reach Code Amendments
Promoting Healthy, Safe Homes & Buildings



What Are Reach Codes?

Reach codes provide an opportunity for local governments to amend the 2019 state building code for new homes and commercial buildings. The amendments or "reach codes" are designed to encourage low-cost all-electric new construction of healthier, safer, and zero emission buildings while making it easier to charge electric vehicles.

Why Reach Codes?

- Incentivize lowest-cost construction options
- Encourage development of healthier, safer, lower emission buildings
- Reflect the sustainability-related values of our community
- Improve indoor air quality and reduce the risk of fires

New all-electric homes and apartments can save thousands!

Single Family Home Reach Code Options

Builders and developers can choose between an all-electric or mixed fuel construction option. The code encourages the all-electric option as it is less expensive, provides a healthier, safer residence while significantly reducing pollution.

Construction Options	All-Electric Construction	Mixed Fuel Construction (Electric & Natural Gas)
Efficiency required above state code (compliance margin)	0%	Additional 17 to 29%
Estimated increase in construction cost	$0	Extra $6,800 to $7,000
Emissions from gas	Zero	4+ metric tons of CO_2 per year
Indoor air quality	Best	Worse
Equipment utilized	All electric appliances	Gas connection, gas meter, gas furnace and water heater, CO monitor, electrical wiring to all gas appliances for future switch to electric with additional options for additional PV/solar and storage required

PENINSULA CLEAN ENERGY

OFFICE OF SUSTAINABILITY
COUNTY OF SAN MATEO

To learn more, visit
PeninsulaReachCodes.org

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