

**From:** [Ann Edminster](#)  
**To:** [mderwin@portolavalley.net](mailto:mderwin@portolavalley.net); [MChuang@hillsborough.net](mailto:MChuang@hillsborough.net); [Sandy Wong](#); [Mima Guilles](#)  
**Subject:** Reach code  
**Date:** Thursday, September 12, 2019 5:11:07 PM

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**Subject: Statement of support for San Mateo County & cities' Reach Code adoptions**

Honorable C/CAG Board Chair, Vice Chair, Executive Director, and EA/Clerk of the Board,

This email is in reference to Item 6.4 on tonight's C/CAG Board Meeting agenda (Sep 12, 2019) – "Update on countywide Reach Code adoption effort.

I urge you to pass the most ambitious possible reach codes advancing decarbonization in your jurisdictions at the earliest opportunity. We cannot act quickly enough to combat the deleterious effects of climate change.

Please take decisive action, now.

Very sincerely yours,

Ann Edminster

**From:** [Bruce Mast](#)  
**To:** [mderwin@portolavalley.net](mailto:mderwin@portolavalley.net); [MChuang@hillsborough.net](mailto:MChuang@hillsborough.net); [Sandy Wong](#); [Mima Guilles](#)  
**Subject:** Statement of support for San Mateo County & cities' Reach Code adoptions  
**Date:** Thursday, September 12, 2019 1:48:36 PM

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Honorable C/CAG Chair, Vice Chair, Executive Director, and EA/Clerk of the Board,

This email is in reference to Item 6.4 on tonight's C/CAG Board Meeting agenda (Sep 12, 2019) – "Update on countywide Reach Code adoption effort."

I would like to add my voice in support of reach codes modeled on Menlo Park's Ordinance No. 1057, adopting updated building codes and local amendments to the 2019 California Energy Code that would require higher levels of building electrification and solar production for newly constructed buildings to reduce greenhouse gas emissions. As a state, we have made tremendous strides in improving the overall energy efficiency of our new housing stock. The 2020 codes will make rooftop solar a standard part of the mix. To make further progress towards zero carbon homes, we have to address the 25 million tons of eCO<sub>2</sub> emitted annually when we burn methane in our gas appliances, not to mention the additional warming impacts from all the methane leaks from the gas distribution system.

This year, I have had the privilege of leading the [Peninsula Climate Comfort pilot](#), sponsored by Peninsula Clean Energy. The pilot is providing design assistance services and incentives to five households who would like to replace gas appliances with high performing electric versions. In planning and launching the pilot, I've been encouraged by the strong interest among San Mateo residents in lowering their carbon footprint, reducing their gas bill, and adopting safer, higher performing heat pump technologies. Our in-depth assessments of case study participants has shown that beneficial electrification of gas appliances is an effective means of reducing GHG emissions and saving energy, particularly when combined with rooftop solar and energy efficiency measures. The opportunities are even greater on the new construction front so I commend you for taking this critical step.

Best regards,

Bruce Mast  
Principal, Ardena Energy, LLC

**From:** [Bruce Naegel](#)  
**To:** [MChuang@hillsborough.net](mailto:MChuang@hillsborough.net); [mderwin@portolavalley.net](mailto:mderwin@portolavalley.net); [Sandy Wong](#); [Mima Guilles](#)  
**Subject:** CCAG and REACH Codes  
**Date:** Thursday, September 12, 2019 5:37:31 PM

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Body:

Honorable C/CAG Board Chair, Vice Chair, Executive Director, and EA/Clerk of the Board,

Sometimes we are lucky and get to participate in a movement with a big effect. Forming Peninsula Clean Energy was one of those events.

You have another opportunity with the REACH codes. A bulldign lasts 50 year. A REACH code now saves 50 years of burning gas. Please consider this in hour vote.

Thanks for listening.

This email is in reference to Item 6.4 on tonight's C/CAG Board Meeting agenda (Sep 12, 2019) – "Update on countywide Reach Code adoption effort."

(add y

Bruce Naegel  
Director, Metrics and Research  
Sustainable Silicon Valley 

650 996 5793 Mobile  
[bnaegel@sustainablestv.org](mailto:bnaegel@sustainablestv.org)

**From:** [Christine Zaugg](#)  
**To:** [mderwin@portolavalley.net](mailto:mderwin@portolavalley.net); [mchuang@hillsborough.net](mailto:mchuang@hillsborough.net); [Sandy Wong](#); [Mima Guilles](#)  
**Subject:** Statement of support for San Mateo County & cities' Reach Code adoptions  
**Date:** Thursday, September 12, 2019 5:17:46 PM

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Honorable C/CAG Board Chair, Vice Chair, Executive Director, and EA/Clerk of the Board,

This email is in reference to Item 6.4 on tonight's C/CAG Board Meeting agenda (Sep 12, 2019) – "Update on countywide Reach Code adoption effort."

As part of the Fossil Free Buildings Coalition, I am writing you on behalf of the well-established nonprofit organization I represent, [Sustainable San Mateo County](#) (SSMC), to express our full support for a countywide Reach Code adoption. As you know, decarbonization and electrification have a huge role to play in addressing climate change. The time to act is now and clear and courageous climate leadership is needed at the local level. We hope that C/CAG will support these important efforts towards a healthy, sustainable and prosperous future for all in our county.

Respectfully yours,  
Christine

-----  
Christine Kohl-Zaugg, Executive Director

[Sustainable San Mateo County](#)

o: 650.918.1992 | c: 650.868.8478

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***We have moved! Please update your contacts with our new address:***

**2955 Campus Drive, #110, San Mateo, CA 94403**

View the [Indicators Report online](#), including the [2018 Key Indicator: Climate Change](#)

**From:** [James Payne](#)  
**To:** [mderwin@portolavalley.net](mailto:mderwin@portolavalley.net); [MChuang@hillsborough.net](mailto:MChuang@hillsborough.net); [Sandy Wong](#); [Mima Guilles](#); [ccarlton@menlopark.org](mailto:ccarlton@menlopark.org)  
**Subject:** Statement of support for San Mateo County & cities' Reach Code adoptions  
**Date:** Thursday, September 12, 2019 7:10:44 PM

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Honorable C/CAG Board Chair, Vice Chair, Executive Director, EA/Clerk of the Board, and Councilmember Carlton,

This email is in reference to Item 6.4 on tonight's C/CAG Board Meeting agenda (Sep 12, 2019) – "Update on countywide Reach Code adoption effort." I'm writing as a resident of Menlo Park and a member of its Environmental Quality Commission (though I'm speaking only for myself) to express my strong support for the adoption of reach codes to keep our cities' decarbonization efforts ahead of the curve set by the state. Electrifying our buildings is one of the quickest routes we have toward reducing our greenhouse gas emissions, particularly in an area where we fortunately receive so much of our electricity from zero carbon sources. Electrification also improves the health and safety of our buildings while potentially lowering costs significantly in construction and maintenance. I'm proud of the efforts that Menlo Park has been making to adopt reach codes to decarbonize our city.

While we are unfortunate that so much of our county lies very close to sea level and is threatened directly by the climate crisis, we are fortunate to have many of the resources to serve as climate leaders for our state, country, and world. The faster we can decarbonize as a community to show the world how to do so, the better the chance we have of slowing climate change as much as possible. Thank you all for considering this issue, and I hope to see our county lead the way forward on confronting the climate crisis.

Best,  
James Payne

**From:** [Libby & Len Traubman](#)  
**To:** [Mima Guilles](#)  
**Subject:** Mima Guilles -- from Len Traubman  
**Date:** Tuesday, September 17, 2019 1:31:47 AM

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*Dear Mima,*

*So much was happening during the long San Carlos C/CAG meeting last Thursday, September 12th.*

*In case it helps a bit, I'm writing to let you see in writing my 2-minute public testimony about green-building REACH Codes that evening.*

*Appreciating you,      Len Traubman, San Mateo*

I am Len Traubman, a retired pediatric dentist, residing in San Mateo 42 years, married 52 years, and still learning and changing.

Today I am appealing to you to **adopt unprecedented green-building REACH Codes, to save Earth and money.**

In 1969, our first family car was a Buick Centurion at 9 mpg; today our Toyota Prius hybrid is 50 mpg. We travel the same distance today using 1/5 the fossil fuel.

In 1977, we chose to install solar hot water panels to reduce family spending for methane gas, which today we shouldn't be using at all for the sake of our planet.

More recently, our on-demand hot water tank, improved home and duct insulation, and up-to-date heating system have cut in half our family use of methane gas and lowered our bills.

By 2003, we invested in solar electric panels on our roof. Today our family electricity bill is 75 cents a day, including for our all-electric kitchen.

Our family's quality of life remains excellent. Libby and I hope our examples of change show how the power of choice can help heal our ailing planet and improve our economy.

**Please be your best selves and adopt the strongest possible green-building REACH Codes you possibly can, for all the right, highest reasons.**

Libby and Len Traubman  
1448 Cedarwood Drive, San Mateo, CA 94403  
Phone: 650-574-8303   Cell: 650-200-8913   Skype: libbyandlenraubman  
E-mail: [LTRAUBMAN@igc.org](mailto:LTRAUBMAN@igc.org)      Web: <http://traubman.igc.org>

*"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has." - Margaret Mead*

**From:** [Scott Shell](#)  
**To:** [mderwin@portolavalley.net](mailto:mderwin@portolavalley.net); [MChuang@hillsborough.net](mailto:MChuang@hillsborough.net); [Sandy Wong](#); [Mima Guilles](#)  
**Subject:** support for requiring an all-electric reach codes  
**Date:** Thursday, September 12, 2019 4:59:29 PM  
**Attachments:** [image002.png](#)  
[190821 Cost effectiveness of all electric buildings.pptx](#)

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This email is in reference to Item 6.4 on tonight's C/CAG Board Meeting agenda (Sep 12, 2019) – "Update on countywide Reach Code adoption effort."

Our 65 person architectural firm has been designing all electric buildings since 2001, and can attest that it is affordable, reliable, and a good solution for our clients.

Our largest client is the University of California which now prohibits gas for heating or hot water on all new buildings on all ten of their campuses for all building types including academic, student housing, office, labs, etc.

When electrification reach codes started to be discussed, I reached out to the mechanical engineers we work with and interviewed them asking if the building industry as a whole was ready for all electric buildings and if it was cost effective. Their answer was YES. I've attached a slide deck summarizing their comments and showing dozens of all electric buildings from different firms.

If there is a problem with our buildings after construction, our firm is responsible and I get those phone calls, so we have to be very confident in a solution before we recommend it to our clients. We are now recommending to all our clients today to go all electric.

I would like to strongly advocate for an electric reach code similar to Menlo Park.

<https://www.mercurynews.com/2019/08/28/menlo-park-opts-for-a-natural-gas-ban-almost-as-restrictive-as-berkeley/>

In their staff report to council they say why they decided on **requiring** all electric (with exceptions) rather than relying on incentives—because incentives are only partially effective.

<https://www.menlopark.org/DocumentCenter/View/22645/H4---20190827-Reach-codes-CC>

Here is the excerpt:

"For example, Sonoma Clean Power offered significant rebates to electrify the rebuild of homes after the 2017 wildfires. Permit applicants could choose between higher energy efficiency standards for a \$7,500 rebate or all-electric standard for a \$12,500 rebate. In addition to the all-electric rebate, a homeowner would save on upfront construction costs by not installing natural gas infrastructure. As a result of the rebate program, **only one-third of permit applicants or homeowners choose the all-electric home**. It showed that incentive type regulations based on cost savings fall short on achieving the desired outcome."

So Menlo Park decided to require electric for everything but gas stoves and fireplaces in single

family--the two appliances that people cared about.

In multifamily it is now typical to have electric stoves and not have gas inside each unit because running the gas piping is too expensive.

They also made an exception for Life Science Research Labs for heating only based on one developers advocacy, and the Council put in place an appeals process for cases that they could not foresee. Only one person spoke in opposition at the council meeting.

I believe the Reach Codes that require a few percent more energy efficient design will not be a strong motivation. Our firm is required to beat Title 24 energy code by 20% by many clients and it is just not that difficult to do.

So I encourage you to **recommend an all electric requirement**, with exceptions as you see appropriate.

Sincerely,  
Scott Shell

-----

**Scott Shell** FAIA, LEED® AP BD+C, CPHC®  
Principal

Pier 1 The Embarcadero, Bay 2  
San Francisco, CA 94111  
[+1 415-214-7277](tel:+14152147277)



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**From:** Scott Shell <[Scott.Shell@ehdd.com](mailto:Scott.Shell@ehdd.com)>

**Date:** Thursday, September 12, 2019 at 2:41 PM

**To:** Doug Silverstein <[doug@greensmc.org](mailto:doug@greensmc.org)>

**Subject:** RE: Building on Menlo Park momentum - 6.30p tonight in San Carlos

Doug,  
I can email if you send me the address  
Thanks,  
scott

**Scott Shell** FAIA, LEED® AP BD+C, CPHC®

Principal

Pier 1 The Embarcadero, Bay 2  
San Francisco, CA 94111  
[+1 415-214-7277](tel:+14152147277)



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**From:** Doug Silverstein <[doug@greensmc.org](mailto:doug@greensmc.org)>

**Sent:** Thursday, September 12, 2019 10:07 AM

**To:** Kat <[lotusgirl72@gmail.com](mailto:lotusgirl72@gmail.com)>; Diane Bailey <[diane@menlospark.org](mailto:diane@menlospark.org)>

**Cc:** Ann Edminster <[ann@annedminster.com](mailto:ann@annedminster.com)>; Bruce Mast <[bruce@ardenna-energy.com](mailto:bruce@ardenna-energy.com)>; Deb Martin <[debbusermartin@gmail.com](mailto:debbusermartin@gmail.com)>; Delforge, Pierre <[pdelforge@nrdc.org](mailto:pdelforge@nrdc.org)>; Erin Cooke <[erinmcooke@gmail.com](mailto:erinmcooke@gmail.com)>; Julie Allingham <[julie.allingham@gmail.com](mailto:julie.allingham@gmail.com)>; Menlo Together Core Team <[menlo-together-core-team@googlegroups.com](mailto:menlo-together-core-team@googlegroups.com)>; Panama Bartholomy <[panamabartholomy@gmail.com](mailto:panamabartholomy@gmail.com)>; Rachel Golden <[rachel.golden@sierraclub.org](mailto:rachel.golden@sierraclub.org)>; Ruth Merino <[ruthgmerino@gmail.com](mailto:ruthgmerino@gmail.com)>; Ryann Price <[ryanneprice@gmail.com](mailto:ryanneprice@gmail.com)>; Scott Shell <[Scott.Shell@ehdd.com](mailto:Scott.Shell@ehdd.com)>; Sean Armstrong <[seanarmstrongpm@gmail.com](mailto:seanarmstrongpm@gmail.com)>; [ffbsv-supporters@googlegroups.com](mailto:ffbsv-supporters@googlegroups.com); [jamespayne1987@gmail.com](mailto:jamespayne1987@gmail.com); [josie\\_gaillard@me.com](mailto:josie_gaillard@me.com)

**Subject:** Re: Building on Menlo Park momentum - 6.30p tonight in San Carlos

Resending with [link](#) to agenda (no attachment)

ALSO – if you can't make it but want to email now, I have email instructions... send me note.  
But in person comments are so much better.

Doug

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**From:** Doug Silverstein <[doug@greensmc.org](mailto:doug@greensmc.org)>

**Date:** Thursday, September 12, 2019 at 9:47 AM

**Subject:** Building on Menlo Park momentum - 6.30p tonight in San Carlos

Hi all,

**Reach Codes are on the C/CAG Board meeting agenda tonight!**

6.30pm start at SMC Transit District Office (ok to arrive by 7p)  
1250 San Carlos Ave, 2nd Floor, San Carlos, CA 94070  
2 min comment during item 6.4 discussion (not 3.0) - agenda attached

For those that don't know, [C/CAG](#) is SMC's agency with 1 councilmember from all 20 cities and 1 Supervisor from the County that governs cross-boundary issues in energy, water, waste, transit, air quality, and airport land.

**This is a HUGE opportunity to speak directly to 21 SMC jurisdictions that are now deciding on**

## Reach Codes.

**\*\*\* CAN YOU COME make a 2-minute appeal to these 21 decision makers tonight? \*\*\***

Share exciting momentum in your city, or why you care about green buildings, carbon free cities, happy and healthy living for the next generations. You don't have to be from SMC if you've been involved in the PCE/SVCE effort. They all know about RCs but need to hear that more people care

I have 4-5 public speakers coming and I am authorized to make a short preso on nonprofit contribution to this effort.

LMK.... Thanks.... Doug

Also – I'm rallying speakers for Tue Sep 17 9a SMC Board of Sups meeting in RWC.

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**From:** <[ffbsv-supporters@googlegroups.com](mailto:ffbsv-supporters@googlegroups.com)> on behalf of Kat <[lotusgirl72@gmail.com](mailto:lotusgirl72@gmail.com)>

**Date:** Wednesday, September 11, 2019 at 6:51 AM

**To:** Diane Bailey <[diane@menlospark.org](mailto:diane@menlospark.org)>

**Cc:** Ann Edminster <[ann@annedminster.com](mailto:ann@annedminster.com)>, Bruce Mast <[bruce@ardenna-energy.com](mailto:bruce@ardenna-energy.com)>, Deb Martin <[debbusermartin@gmail.com](mailto:debbusermartin@gmail.com)>, "Delforge, Pierre" <[pdelforge@nrdc.org](mailto:pdelforge@nrdc.org)>, Erin Cooke <[erinmcooke@gmail.com](mailto:erinmcooke@gmail.com)>, Julie Allingham <[julie.allingham@gmail.com](mailto:julie.allingham@gmail.com)>, Menlo Together Core Team <[menlo-together-core-team@googlegroups.com](mailto:menlo-together-core-team@googlegroups.com)>, Panama Bartholomy <[panamabartholomy@gmail.com](mailto:panamabartholomy@gmail.com)>, Rachel Golden <[rachel.golden@sierraclub.org](mailto:rachel.golden@sierraclub.org)>, Ruth Merino <[ruthgmerino@gmail.com](mailto:ruthgmerino@gmail.com)>, Ryann Price <[ryanneprice@gmail.com](mailto:ryanneprice@gmail.com)>, Scott Shell <[Scott.Shell@ehdd.com](mailto:Scott.Shell@ehdd.com)>, Sean Armstrong <[seanarmstrongpm@gmail.com](mailto:seanarmstrongpm@gmail.com)>, "ffbsv-supporters@googlegroups.com" <[ffbsv-supporters@googlegroups.com](mailto:ffbsv-supporters@googlegroups.com)>, "jamespayne1987@gmail.com" <[jamespayne1987@gmail.com](mailto:jamespayne1987@gmail.com)>, Josie Gaillard <[josie\\_gaillard@me.com](mailto:josie_gaillard@me.com)>

**Subject:** Re: Menlo Park Adopts a Nearly All Electric Reach Code!

Hi Diane,

This is really great news!!! Awesome work to all who had a role to play. Thank you for sharing and I look forward to hearing more about today.

Kat

On Tue, Sep 10, 2019 at 9:57 PM Diane Bailey <[diane@menlospark.org](mailto:diane@menlospark.org)> wrote:

Goods news this evening out of Menlo Park! The City voted to adopt the proposed [Reach Code](#), that requires new homes to be nearly all electric, and commercial & high rise multi-family to be entirely electric\* (with a few exemptions). Please see the details below.

They'll need to do a second/final reading on Sept. 24<sup>th</sup>, but for now this is the strongest reach code in the area. Woohoo!

Huge thanks to supporters who wrote excellent comment letters & turned out to city council meetings. And the biggest props go to Tom Kabat, who brought the idea to the Environmental Quality Commission & guided it from zero interest in the beginning to the city embracing climate leadership.

Let's more cities to go, but I hope we can celebrate on the 24<sup>th</sup>.

Best,  
Diane

Here's a summary of the code:

1. Requires new residential buildings (three stories or less) to be electrically heated or all-electric & use electric dryers. This means at minimum new residential buildings need to use electricity for space heating and water heating in the building. Natural gas can still be used for cooking appliances, fireplaces, or other uses if desired.
2. Requires new nonresidential and high-rise residential (greater than three stories) to be all-electric, including, but not limited to cooking appliances, fireplaces, clothes dryers with the following proposed exceptions:
  - Exception No. 1: Life science building uses may use natural gas for space heating if desired (*but they need to investigate the feasibility of going electric*)
  - Exception No. 2: Public agency owned and operated emergency operations centers.
- Note: commercial restaurants may appeal to EQC and further appeal to Council if a serious challenge arises.
3. Requires new nonresidential buildings and high-rise residential to have a minimum amount of on-site solar production. (*Note that this will already be required for low rise residential through the state code*)

**Diane Bailey | Executive Director**

MENLO SPARK

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**Bay Area Home  
Electrification Expo**

October 10 | Palo Alto  
October 12 | San José  
Register at [bayareaexpo.org](http://bayareaexpo.org)

You received this message because you are subscribed to the Google Groups "Fossil Free Buildings Campaign Silicon Valley" group.

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To view this discussion on the web visit <https://groups.google.com/d/msgid/FFBSV-Supporters/CAO--QY9T5M6LwCG-WZASHbgXSRqPJPZkx%2B4ExQNUd4AyuEpD4Q%40mail.gmail.com>.

# The Cost Effectiveness of Building Electrification

Comments from Bay Area Architects & Engineers

August 21, 2019

Scott Shell, FAIA, Principal

**ehdd.**





Casa Adelante, 2060 Folsom, San Francisco



Maceo May Veterans Apartments, Treasure Island



Balboa Upper Yard Family Apts, San Francisco

## Malcolm Harris, Principal

### **MITHŪN**

We have a number of all-electric multifamily housing projects. I'm a huge, huge fan of this change to all-electric multifamily housing. It is better in every way, a great simplification of the system. Less expensive, higher performance, less maintenance, more sustainable.

**It is a major cost saving move that pays for a lot of other upgrades.**

At Maceo May we saw big savings from eliminating gas fired hydronic heating, the gas connection, and the solar thermal required by T24.

The savings paid for continuous exterior insulation, energy recovery ventilators (eliminating Z-ducts), electric resistance heat, and PVs. With these upgrades we are beating Title 24 by 20%, getting more Green Points, and lower GHGs on a grid that's getting cleaner.

The occupants get better indoor air quality benefits from the energy recovery ventilators.



Hunters Point Shipyard Block 52, San Francisco



Hunters Point Shipyard Block 54, San Francisco



681 Florida, San Francisco

## Malcolm Harris, Principal

# MITHUN

Overall the system is just much simpler—there is just one energy system—electrical, rather than two.

The gas fired boiler & hydronic systems are very problematic at every step from design to construction to maintenance. During construction there are often leaks. Commissioning is a constant challenge, and there are lots of tenant complaints in first few months. Operations is challenging as maintenance staff are not equipped to operate the digital BMS system.

**Casa Adelante** 127 residential Units, 9 stories, under construction. Developers: TNDC/CCDC, Architect: Mithun & YA Studio.

**Maceo May** 105 residential units, in permitting. Chinatown Community Development Center, Swords to Plowshares.

**Balboa Upper Yard Family Apts** 120 residential units, in design development. Developer Mission Housing Development & Related California.

**Hunters Point Shipyard Block 52** 136 residential units total, Design Development. Developer McCormack, Baron, Salazar.

**Hunters Point Shipyard Block 54** 136 residential units total, Design Development. Developer McCormack, Baron, Salazar.

**681 Florida** 136 residential units total, In Design Development. Developers: TNDC & MEDA



Santana Row Lot 11



UC Davis Webster Hall Replacement



American Geophysical Union

## Hormoz Janssens, Principal



Almost all our projects are all-electric, I have only been using gas systems where required by the client.

**Electric is almost always less expensive or cost neutral. Very rarely is it more expensive. Often it is our value engineering option.**

Most project types work just fine. We are doing a 500,000 sf all electric office for Microsoft, with major cost savings using heat pumps vs a central plant.

We do lots of detailed cost analysis with developers to find the most cost-effective solution. For example, at Bay Meadows our all electric design for 1 million sf of development was significantly less expensive than a traditional rooftop package unit + boiler + reheat system.



UC Santa Cruz Student Housing West



270 Brannan, San Francisco



Chatam University Dining Commons

## Hormoz Janssens, Principal

**INTERFACE  
ENGINEERING**

The space requirements are smaller for all-electric, instead of having two to three separate systems for space heating, cooling, and hot water, we can do it with a single heat pump system, that space can be used for other things or the building made smaller for more savings.

Maintenance is less than most conventional systems because you have just one system. Maintenance is just like an air-conditioning system, it's the same thing in reverse, and you eliminate the boiler.

A huge benefit for heat pumps is reducing water use. Using an air source heat pump for cooling rather than a cooling tower has large water savings.

We've done several all electric commercial food service projects that have been very successful. The Chef's quite skeptical at the beginning, but now say they will never go back to cooking on gas.



UC Santa Cruz Student Housing West



UC Irvine Student Housing West, Developer ACC



UC Riverside Dundee Residence Hall, Developer ACC

## David Phillips, Associate Vice President for Energy & Sustainability UC Office of the President



The University of California has committed to carbon neutrality by 2025. We are prioritizing all-electric new buildings (required starting June 2019), and then electrifying existing buildings & systems over time.

Our studies show that all electric mechanical equipment capital costs are comparable for academic & lab buildings, and the costs are lower for residential buildings. Twenty year life cycle costs are comparable for Academic and labs buildings, and lower for residential buildings.

**UC has many all-electric housing projects, office buildings, and laboratories now in place and many more in design.**

UC's carbon neutrality strategies are pragmatic: don't allow growth to increase carbon emissions; and then transition *existing* buildings and systems off fossil fuels over time.

Decarbonizing Your Campus thru Electrification, SCUP 2019



Exploratorium, San Francisco



Packard Foundation, Los Altos



Marin Country Day School, Corte Madera

## Scott Shell, Principal



We have completed a dozen or so all electric buildings. 10-15 years ago it was not common in California, and we saw some cost premium on those early projects.

In the last 5-7 years all-electric has become much more common on our projects which are primarily commercial and educational. It is now generally cost neutral or less expensive. There are more manufacturers providing equipment, and the subcontractors are more familiar with installing it.

Last year we had an all-electric project go to bid and the total cost came back higher than expected. In an attempt to reduce cost, we asked the mechanical contactors to price a standard gas heating system instead. They came back with no cost savings between gas and all electric, so the client decided to stay with the preferred all-electric option.



Mark Day School, San Rafael



Boulder Commons



Lick Wilmerding High School, San Francisco

## Scott Shell, Principal



When the University of California, one of our largest clients, decided to prohibit gas in new projects that really got our attention. It now seems irresponsible to recommend gas to our clients who may then have to retrofit them before that equipment reaches the end of its life in order to meet their carbon goals or local mandates to decarbonize. We don't want to be saddling our clients with stranded assets.

Last year I interviewed seven leading mechanical engineers that we work with asking if the building industry is ready to go all electric. They agreed that the vast majority of buildings can go all-electric, and the cost is competitive with a few exceptions.

Most of our all electric projects also include PVs, it is LESS expensive for our clients to get their electricity from PV than from their utility. With a power purchase agreement there is no out of pocket cost. Some clients decided to fund the PVs themselves since it provides a favorable financial return. Ten years ago solar was seen as an expensive solution for projects with big budgets. It is amazing to see how quickly that has flipped.



Cascade Apartments, Seattle



4700 Brooklyn Ave NE, Seattle

## Shawn Oram, Principal



Ecotope has completed 26 central heat pump water heating projects since 2008, mostly 100-500 unit projects. Partial list:

### Mid Rise | 50-400 dwelling units

- Stream - 134 units - (2) 10T Colmac Air-Source HP in below-grade parking
- Sunset Electric - 92 units - Colmac in below-grade parking
- Stackhouse - 120 units - Colmac in underground parking deck
- Augusta Apartments - 224 units - Colmac in below-grade parking
- Batik Apartments - 195 units - Colmac in underground parking deck
- Yesler 3 - 227 - Colmac in underground parking deck
- Jackson Apartments - 526 units - Colmac in underground parking deck
- Colina Apartments - 131 units, Sanden - Decentralized
- The Vale Apartments - 134 units - Versati 2, Multi-Pass
- Waterfront Place - 137/135 units - Versati 2, Multi-Pass
- Hopeworks - 67 units, Sanden CO2 Stacks

### High Rise | 200-450 dwelling units

- 4700 Brooklyn - 284 units - Colmac with VRF Temp Maintenance
- Cascade - 430 units - Colmac with VRF Temp Maintenance
- 1200 45<sup>th</sup> - 245 units - In Design



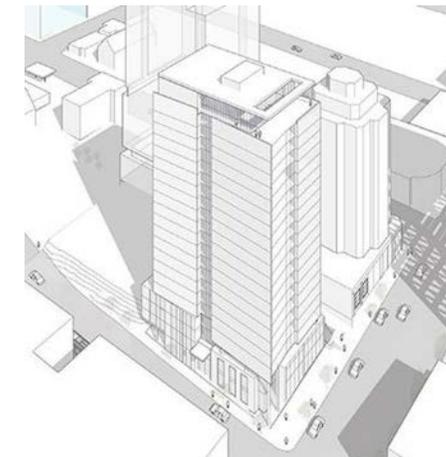
Batik Apartments, Seattle



Jackson Apartments, Seattle



August Apartments, Seattle



1200 NE 45th, Seattle



Coliseum Place, Oakland



Altamira Family Apartments, Sonoma

## Peter Waller, Principal



We have several current all-electric multi-family projects. In our experience it has been indispensable to have a knowledgeable energy/Title 24 consultant on the team to help guide both analysis and design.

It is critical to share information about best practices and lessons learned. By sharing best practices we can reduce mistakes.

We work with both non-profit and for-profit housing developers that own and operate lots of buildings. It is important to make sure everyone is aware of the potential challenges that come with new technology.

The life span of the current generation of heat pump water heaters may be less than the traditional gas fired boilers, depending on operating conditions. We expect the life span will increase as the market becomes deeper and more sophisticated, but we try to be open about this reality with our clients. With that in mind provide access for maintenance and future replacement down the road.



Quetzal Gardens, San Jose



Valley Glen, Dixon



Plaza Point, Arcata

## Sean Armstrong, Redwood Energy

### Redwood Energy

*Foremost Zero Net Energy Specialists in Multifamily Housing*

**All-electric construction consistently reduces construction costs and ongoing utility bills.**

It saves between \$2,500 and \$5,000 per residence for the developer to not plumb gas. When infrastructure and appliance costs are added up, a recent study done by Rocky Mountain Institute found a median increased cost of \$8,800 more per house for gas infrastructure, piping, purchasing appliances and venting

Only education is preventing developers from profiting from the technological innovations available in the all-electric domain.

Developers have been choosing all electric construction because it cost less to build and that trend has been going on for 24 years now.

New construction is easy technically and financially and because the construction cost savings justify going all-electric.



Cloverdale, Corporation for Better Housing



Colonial House Apartments, Oxnard



Atascadero, Corporation for Better Housing

## Sean Armstrong, Redwood Energy

### Redwood Energy

*Foremost Zero Net Energy Specialists in Multifamily Housing*

New construction is easy technically and financially and because the construction cost savings justify going all-electric.

Because an all-electric building can achieve higher mechanical system efficiency than a gas burning building, it is lower cost for developers building all-electric to comply with the Title 24 Energy Code. We documented this in our report A Zero Emissions All-Electric Multi-family Construction Guide, see the graphic on page 7.

<https://fossilfreebuildings.org/ElectricMFGuide.pdf>



152 N. 3<sup>rd</sup>, San Jose



The Tidelands Housing, San Francisco

## Peter Rumsey, Principal



**There are great examples of all electric buildings for virtually every building type that are cost effective. It is very easy for our firm to design these systems, we are very familiar with them.**

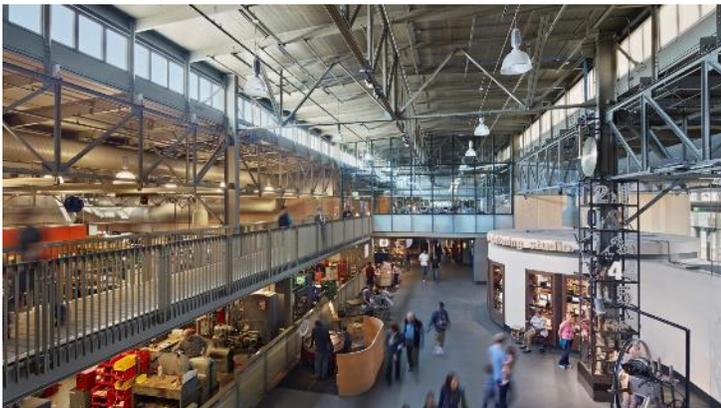
For Multifamily projects we are seeing a lot of developers use electric heating with high levels of insulation in apartments that don't need cooling.

All electric air-cooled VRF heat pumps are very common on multifamily projects up to ten stories where cooling is needed; this is very cost effective.

Developers are using VRF systems on small to medium sized commercial buildings. Production home builders have been using central heat pump heating and cooling units for many years. And we are seeing a surge in the use of larger heat pumps for generating hot water systems. Central hot water systems can have a cost premium, but it is very small as a percentage of the building cost.



Pier 70, Building 12



The Exploratorium, San Francisco

## Peter Rumsey, Principal



Large 20 story multifamily high-rise require a water source heat pump and that equipment still has a cost premium.

Cooking remains a hard sell in many cases, a lot of people are very skeptical of giving up gas. Technically this isn't a problem, the experts at the Food Service Technology Center in San Ramon say an electric fryer provides better and more even heat than gas. Induction ranges are excellent.

The market for all electric buildings and heat pumps has been making significant inroads in California, and this had gotten the attention of manufacturers. General Contractors and mechanical subcontractors are getting more familiar with this approach as well.

Title 24 used to discourage electric heating of all types and is now more neutral on the issue. I understand that future versions of title 24 are going to be more encouraging of some types of electric heating.



Alexander Valley Medical Center



Goldman School of Public Policy + Housing



SMUD Office & Operations Building, Sacramento

## Ted Tiffany, Principal



We have designed quite a few all electric buildings. The Goldman School of Public Policy is as designed all-electric and construction cost compared favorably to gas. This also allowed for individually metered apartments so tenants paid their own utility bills.

The UCOP did a robust cost analysis of various building types and in almost all cases it found lower life cycle costs with all-electric buildings. It is important to manage TOU rates. First cost savings are partly dependent on if you can eliminate the gas service, which in most cases you can; if you do this generally makes the construction cost less than mixed fuel buildings.

[https://www.ucop.edu/sustainability/ files/Carbon%20Neutral%20New%20Building%20Cost%20Study%20FinalReport.pdf](https://www.ucop.edu/sustainability/files/Carbon%20Neutral%20New%20Building%20Cost%20Study%20FinalReport.pdf)



Albany High School



Silver Oak Winery



Sonoma Clean Power

## Ted Tiffany, Principal



For most building types and sizes, there is no technical reason preventing the industry from shifting to all-electric buildings.

Laboratories and Hospitals can be more of a challenge as all electric due to the high outside air loads, demands for sterilization, and high hot water loads. They are possible, but more challenging.



J. Craig Venter Institute Lab, San Diego



SFO Consolidated Admin Facility



Integrated Genomics Lab, LBNL

## Eric Solrain, Principal



Integral currently has dozens of all-electric buildings recently complete, in construction, and in design. There has been a big sea change in recent years towards all-electric. Around 50% of our work is currently electric.

**There is lot of momentum in Multi-family Residential and in Commercial projects moving to electric systems.**

Comparing the construction cost of all-electric to gas depends on what you are comparing it to. If comparing to a high-performance design such as LEED Gold then all-electric is cheaper. If comparing to moderate performance building then all-electric is cost neutral. If comparing to the most basic design, there may be a small cost premium.

There are some significant code changes in California energy code in 2019 that will make all electric even more cost competitive, especially for multifamily.



435 Indio, Sunnyvale



415 Mathilda, Sunnyvale



380 N. Pastoria, Mountain View

## Eric Solrain, Principal



All electric has several big advantages:

- Electric equipment takes up significantly less space and that space can be used for other things. At 1700 Webster the gas option filled the roof with equipment, while the heat pump option had much less equipment so they were able to put a nice deck and pool on the roof.
- Getting gas service to the equipment, and a flue out through the building can be challenging problems and cost money. Getting make-up air to gas boilers can be challenging.
- For large multi-family projects heat-pump dryers avoid all the problems associate with venting.
- There have been good advances in heat pump choices in recent years. Aermec and Climacool make excellent equipment, that can heat and cool simultaneously with robust controls.
- There are huge climate benefits to shifting from gas to electric. London is completely redoing it's 10 year old decarbonization plan which was drafted when they had a dirty electric grid. Their grid is much cleaner now so they are quickly revising the plan to promote electrification.



Edwina Benner, Sunnyvale



Stoddard Housing, Napa



Casa Adelante, San Francisco

## Nick Young



In multifamily buildings with individual heating and hot water systems for each unit it's a no-brainer to go all-electric, from a cost, modeling, technology, and code compliance perspective. **All-electric should be the standard design for these projects.**

For Multifamily buildings with central domestic hot water there are also excellent options using electric heat pumps. We are seeing these projects go with Sanden, Colmac, and Nyle heat pumps.

A significant challenge is that Title 24 doesn't have a modeling pathway for central hot water systems. The CEC is working on fixing this, targeting the 2019 code cycle.

Our all-electric multi-family projects include: Edwina Benner Plaza in Sunnyvale, 2437 Eagle Ave in Alameda, St Paul's Commons in Walnut Creek, Stoddard Housing in Napa, Casa Adelante in San Francisco, and Maceo May in San Francisco.

**From:** [Susan Whitford](#)  
**To:** [mderwin@portolavalley.net](mailto:mderwin@portolavalley.net); [MChuang@hillsborough.net](mailto:MChuang@hillsborough.net); [Sandy Wong](#); [Mima Guilles](#); [arak@cityofsancarlos.org](mailto:arak@cityofsancarlos.org)  
**Subject:** Statement of support for San Mateo County & cities' Reach Code adoptions  
**Date:** Thursday, September 12, 2019 3:04:17 PM

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Honorable C/CAG Chair, Vice Chair, Executive Director, EA/Clerk of the Board, and Adam Rak,

This email is in reference to Item 6.4 on tonight's C/CAG Board Meeting agenda (Sep 12, 2019) – "Update on countywide Reach Code adoption effort."

I support adopting reach codes for new buildings in San Carlos and San Mateo County. Our life on our planet depends on the climate remaining very close to its existing temperatures. Reducing our energy usage and minimizing our use of fossil fuels is key. Thank you for considering these reach codes.

Sincerely,  
Susan Whitford  
88 Hillcrest Rd  
San Carlos, Ca

**From:** [suzanne@emersonenvironmental.com](mailto:suzanne@emersonenvironmental.com)  
**To:** [mderwin@portolavalley.net](mailto:mderwin@portolavalley.net); [MChuang@hillsborough.net](mailto:MChuang@hillsborough.net); [Sandy Wong](#); [Mima Guilles](#)  
**Subject:** Item 6.4 C/CAG Board Meeting 9/12/19 - Support for Countywide Reach Code Adoption  
**Date:** Thursday, September 12, 2019 1:53:58 PM

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Honorable C/CAG Chair, Vice Chair, Executive Director, and EA/Clerk of the Board,

This email is in reference to Item 6.4 on tonight's C/CAG Board Meeting agenda (Sep 12, 2019) – "Update on countywide Reach Code adoption effort."

I strongly support countywide adoption of the Energy Reach Code.

Through my work as a Green Building consultant, I review residential architectural plans every day. It pains me to still see designers using their business-as-usual approach – specifying natural gas for home heating and water heating. To address climate change, we need to STOP BURNING FOSSIL FUEL.

We need to stop installing gas furnaces and water heaters – instead, all new homes should be utilizing efficient and safe heat pumps for home heating and heat pump water heaters.

On average, 80% of a building's energy use is for space heating and water heating. By encouraging new residential buildings to use electricity for space and water heating, we can reduce GHG emissions by about 53% for the first year, and GHG emissions decrease even more as our electricity providers progress to a 100% renewable portfolio.

And, if you want to really be environmental leaders, you could do what Menlo Park, Morgan Hill, and Berkeley are doing – ban natural gas for heating and water heating in all new construction.

Thank you.

Suzanne Henderson Emerson

Emerson Environmental

650-281-9805 [emersonenvironmental.com](http://emersonenvironmental.com)

Based in San Carlos, CA