

Environmental Quality Commission



REGULAR MEETING AGENDA

Date: 4/21/2021

Time: 6:00 p.m.

Regular Meeting Location: [Zoom.us/join](https://zoom.us/join) – ID# 915 4675 0502

NOVEL CORONAVIRUS, COVID-19, EMERGENCY ADVISORY NOTICE

On March 19, 2020, the Governor ordered a statewide stay-at-home order calling on all individuals living in the State of California to stay at home or at their place of residence to slow the spread of the COVID-19 virus. Additionally, the Governor has temporarily suspended certain requirements of the Brown Act. For the duration of the shelter in place order, the following public meeting protocols will apply.

Teleconference meeting: All members of the Environmental Quality Commission, city staff, applicants, and members of the public will be participating by teleconference. To promote social distancing while allowing essential governmental functions to continue, the Governor has temporarily waived portions of the open meetings act and rules pertaining to teleconference meetings. This meeting is conducted in compliance with the Governor Executive Order N-25-20 issued March 12, 2020, and supplemental Executive Order N-29-20 issued March 17, 2020.

- How to participate in the meeting
 - Access the meeting real-time online at:
[Zoom.us/join](https://zoom.us/join) – Meeting ID 915 4675 0502
 - Access the meeting real-time via telephone at:
(669) 900-6833
Meeting ID 915 4675 0502
Press *9 to raise hand to speak

Subject to Change: Given the current public health emergency and the rapidly evolving federal, state, county and local orders, the format of this meeting may be altered or the meeting may be canceled. You may check on the status of the meeting by visiting the City's website www.menlopark.org. The instructions for logging on to the Zoom webinar and/or the access code is subject to change. If you have difficulty accessing the Zoom webinar, please check the latest online edition of the posted agenda for updated information (menlopark.org/agenda).

Regular Session ([Zoom.us/join](https://zoom.us/join) – ID# 915 4675 0502)

A. Call To Order

B. Roll Call – Elkins, Gaillard, Kabat, London, Martin, Payne, Price

C. Public Comment

The public may address the Environmental Quality Commission (EQC) on any subject not listed on the agenda. Each speaker can make public comment for a limit of three minutes once. The EQC

cannot act on items not listed on the agenda other than to provide general information.

D. Regular Business

- D1. Approve the March, 17 2021 minutes ([Attachment](#))
- D2. Begin to discuss climate action plan goals and implementation beyond 2021

E. Reports and Announcements

- E1. Reports and Announcements from staff and commissioners

F. Adjournment

At every Regular Meeting of the Commission, in addition to the Public Comment period where the public shall have the right to address the Commission on any matters of public interest not listed on the agenda, members of the public have the right to directly address the Commission on any item listed on the agenda at a time designated by the Chair, either before or during the Commission's consideration of the item.

At every Special Meeting of the Commission, members of the public have the right to directly address the Commission on any item listed on the agenda at a time designated by the Chair, either before or during consideration of the item.

For appeal hearings, appellant and applicant shall each have 10 minutes for presentations.

If you challenge any of the items listed on this agenda in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Menlo Park at, or prior to, the public hearing.

Any writing that is distributed to a majority of the Commission by any person in connection with an agenda item is a public record (subject to any exemption under the Public Records Act) and is available by request by emailing the city clerk at jaherren@menlopark.org. Persons with disabilities, who require auxiliary aids or services in attending or participating in Commission meetings, may call the City Clerk's Office at 650-330-6620.

Agendas are posted in accordance with Government Code §54954.2(a) or §54956. Members of the public can view electronic agendas and staff reports by accessing the City website at menlopark.org/agenda and can receive email notification of agenda and staff report postings by subscribing to the "Notify Me" service at menlopark.org/notifyme. Agendas and staff reports may also be obtained by contacting City Clerk at 650-330-6620. (Posted:04/16/2021)

Environmental Quality Commission



REGULAR MEETING MINUTES- DRAFT

Date: 3/17/2021

Time: 6:00 p.m.

Regular Meeting Location: Zoom.us/join – ID# 915 4675 0502

A. Call To Order

Chair Price called the meeting to order at 6:00 p.m.

B. Roll Call

Present: Elkins, Gaillard, Kabat, Martin, Price (Chair), Payne

Absent: London (Vice Chair)

Staff: Rebecca Lucky- Sustainability Manager

C. Public Comment

- Scott Marshall spoke in support of the Environmental Quality Commission including the tree removals from San Francisquito Creek upstream of Highway 101/Pope-Chaucer Bridge project in their work plan.
- Steve Vanbelt shared experience with problematic heritage trees that cause property damage, and advocated for receiving better education upfront about how to manage before they cause damage.

D. Regular Business

D1. Approve January 20 2021 and February 25 2021 minutes

Chair Price introduced item.

ACTION: Motion and second (Martin/ Price) to approve January 20 2021 and February 25 2021 minutes with minor corrections to additional text and pending any revisions to work plan review by commissioners, passed 6-0-1 (London absent).

D2. Informational presentation by Commissioner Gaillard and Kabat on the affordability of building electrification (Attachment)

Chair Price introduced item. Commissioners Kabat and Gaillard provided presentation.

E. Reports and Announcements

E1. Reports and Announcements from staff and commissioners

Commissioner Martin requested that a future agenda include review of the tree removals proposed for the San Francisquito Creek upstream of Highway 101/Pope-Chaucer Bridge project.

Commissioner Gaillard provided updates on state legislation regarding phasing out gas powered leaf

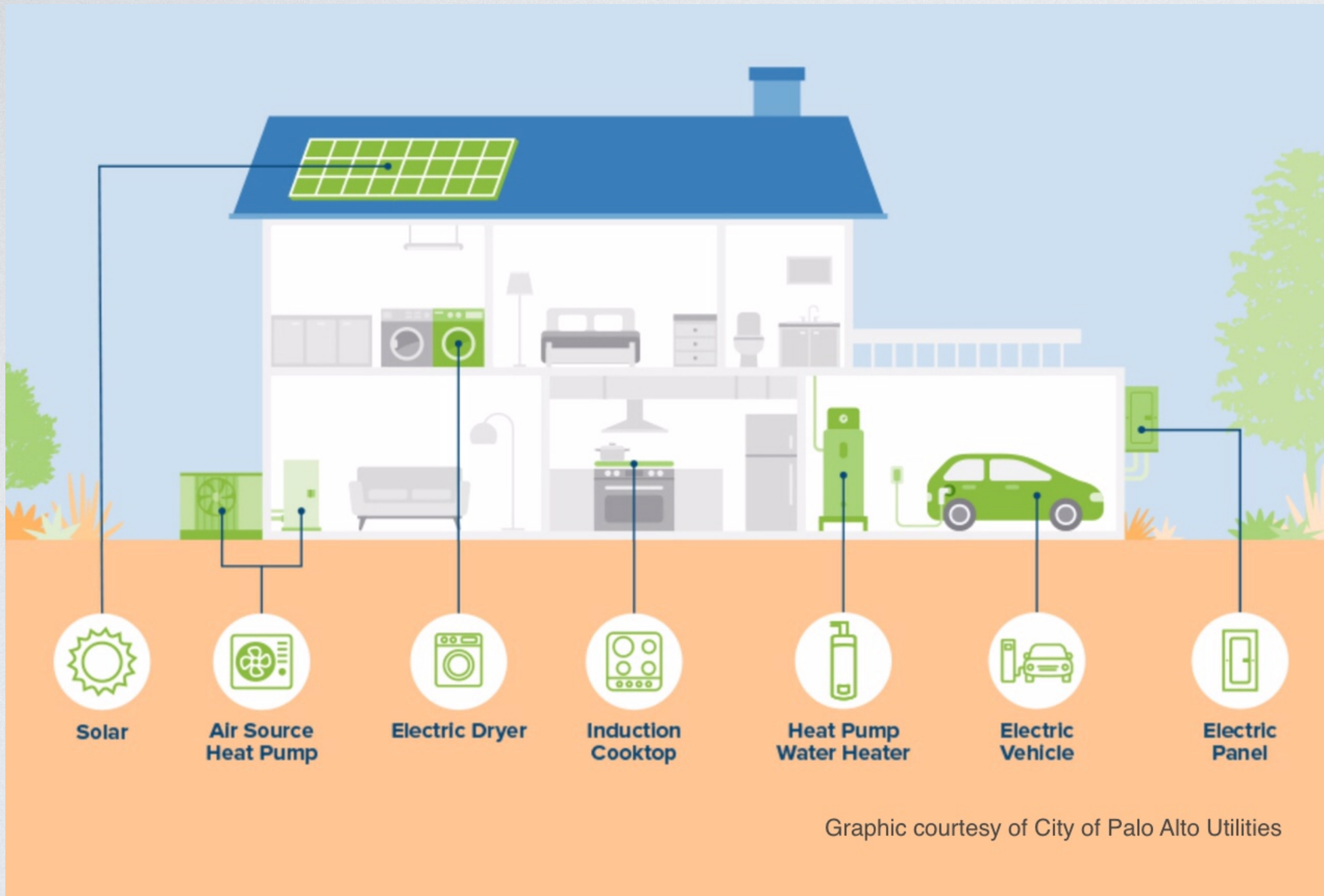
blowers.

Sustainability Manager provided updates on recent City Council staff reports and decisions regarding the 2030 climate action plan.

F. Adjournment

Chair Price adjourned the meeting at 8:19 p.m.

Rebecca Lucky, Sustainability Manager

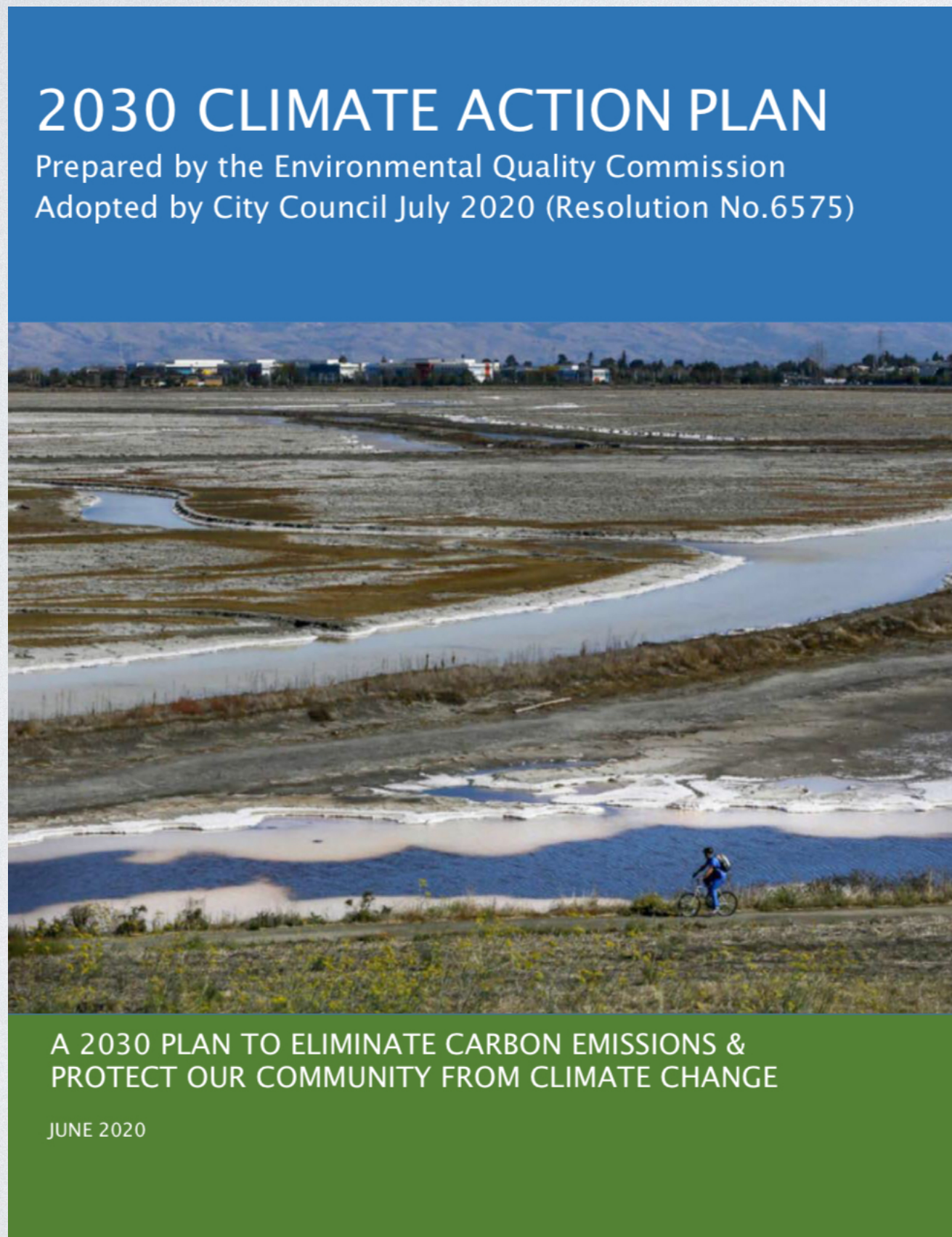


Affordability of Building Electrification

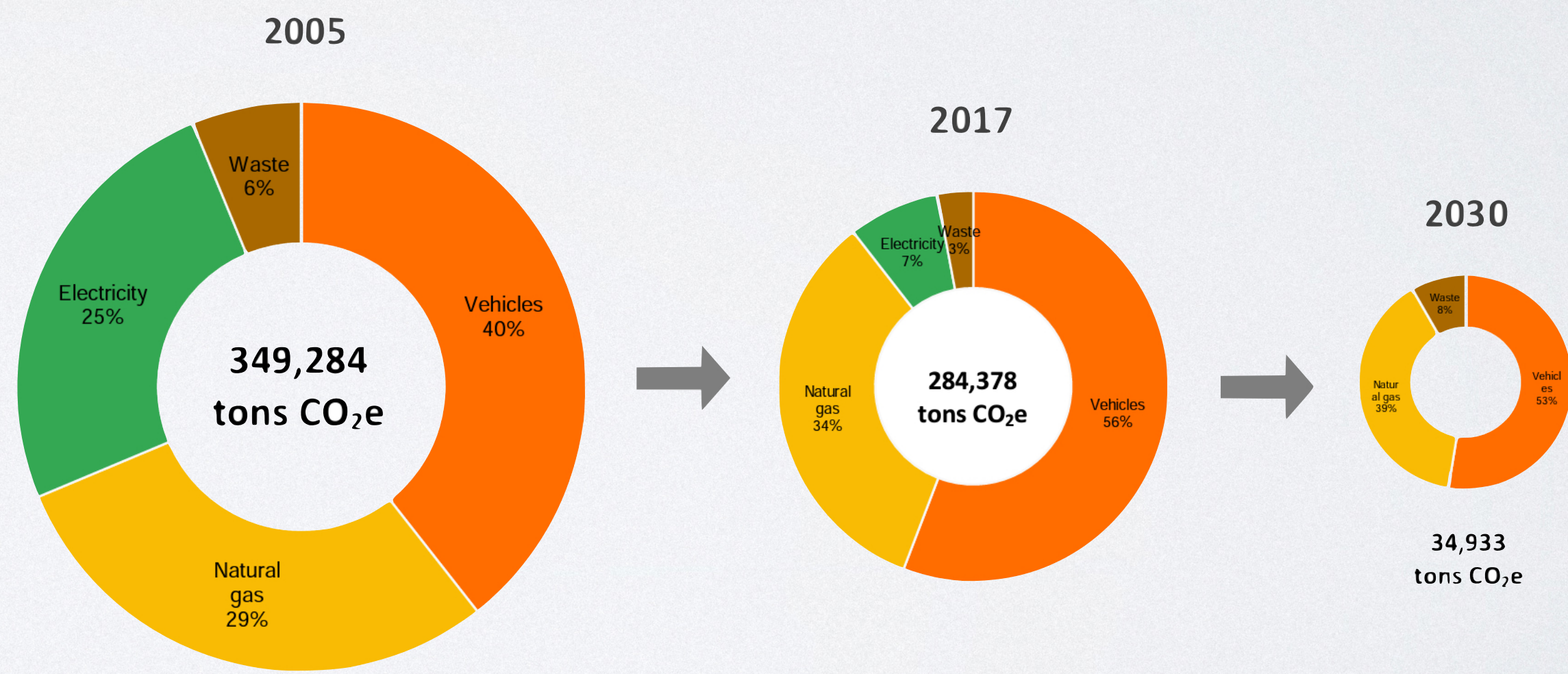
March 17, 2021

Environmental Quality Commissioners Josie Gaillard and Tom Kabat

CLIMATE ACTION PLAN



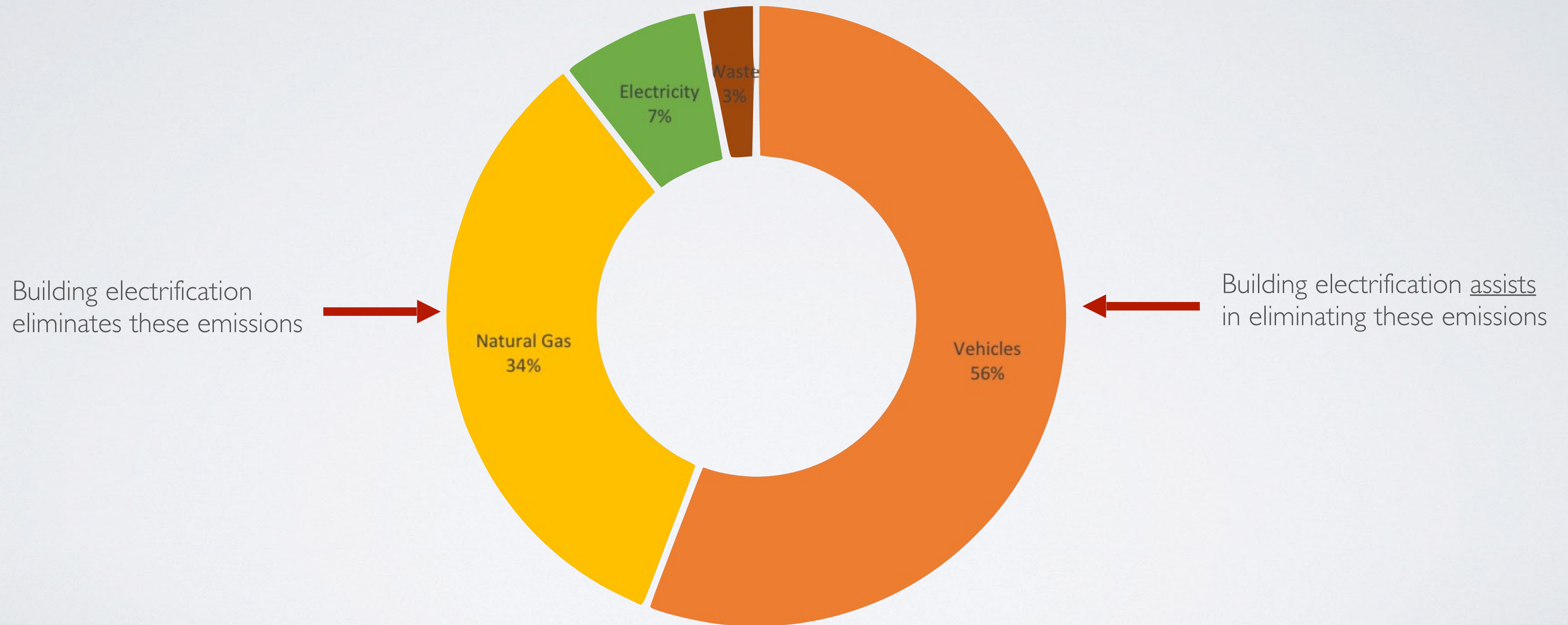
- Adopted by Menlo Park City Council in July 2020
- Sets a goal of 90% reduction in GHG by 2030 and elimination of the remaining 10% through direct carbon removal



MENLO PARK CAP 2020-21

#	Action	2030 GHG Reduction (tons/yr)
1	Explore policy/program options to convert 95% of existing buildings to all-electric by 2030	1) 86,465 OR 2) 51,636
2	Set citywide goals for increasing EVs and decreasing gasoline sales	7,120
3	Expand access to EV charging	7,370
4	Reduce vehicle miles traveled (VMT) by 25% or an amount recommended by the Complete Streets Commission	31,743
5	Eliminate the use of fossil fuels from municipal operations	879
6	Develop a climate adaptation plan to protect the community from sea level rise and flooding	0
		98,748

GHG EMISSIONS PROFILE for Menlo Park



Source: City of Menlo Park December 2019 Staff CAP report

ELEMENTS OF ELECTRIFICATION POLICY

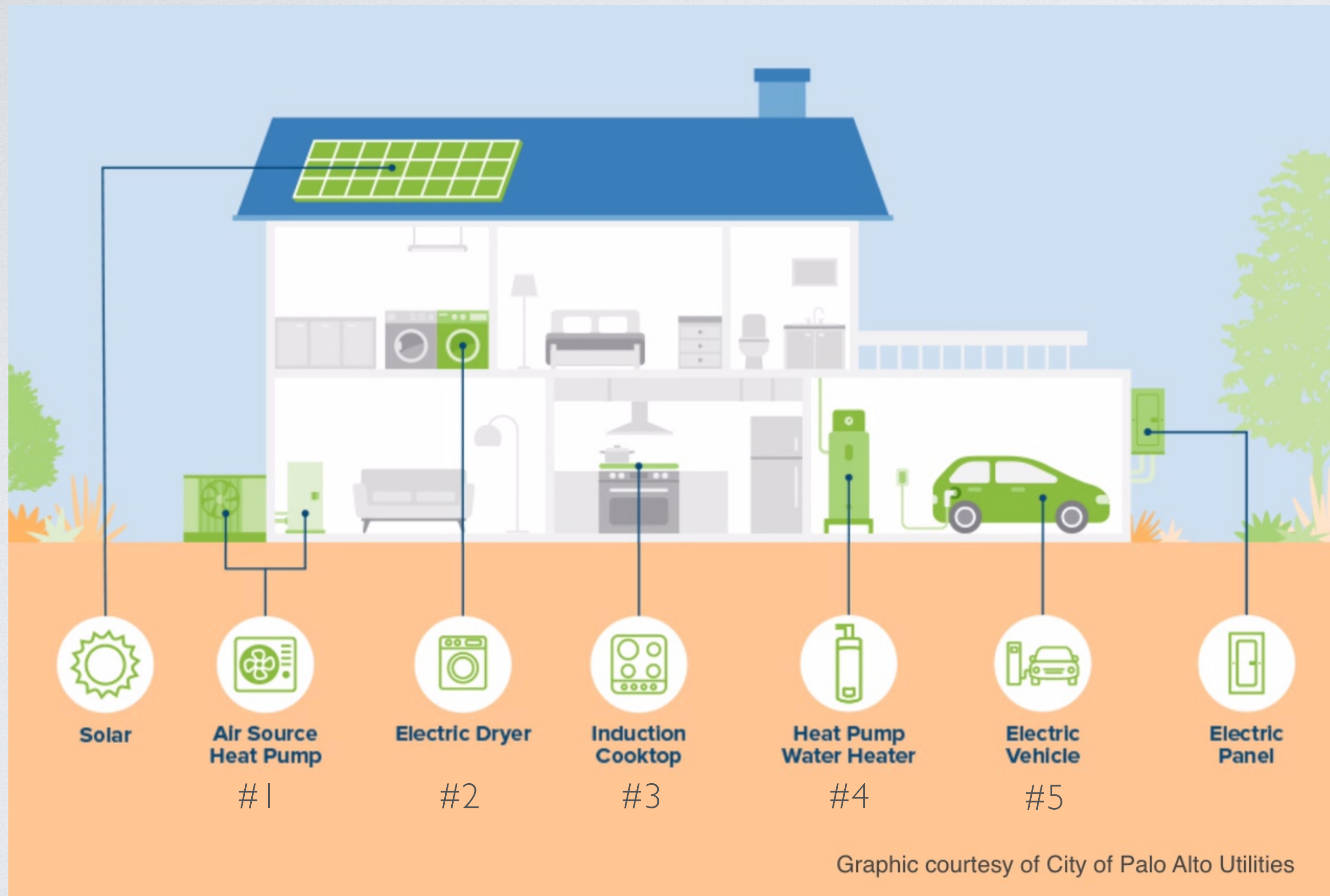
- Legal
- Technical
- Market development
- Enforceability
- **Affordability**

AFFORDABILITY OF ELECTRIFICATION

Basic questions:

1. What does it cost to fully electrify an existing single-family home in San Mateo County?
2. Can we make the transition costs affordable enough to pass city ordinances?
3. What levers do policy makers and utilities have to achieve affordability?
4. What pieces of the puzzle need to be put in place?
5. What partnerships are needed?
6. What can we learn from development of rooftop solar installation or other industries?

WHAT IS BUILDING ELECTRIFICATION?



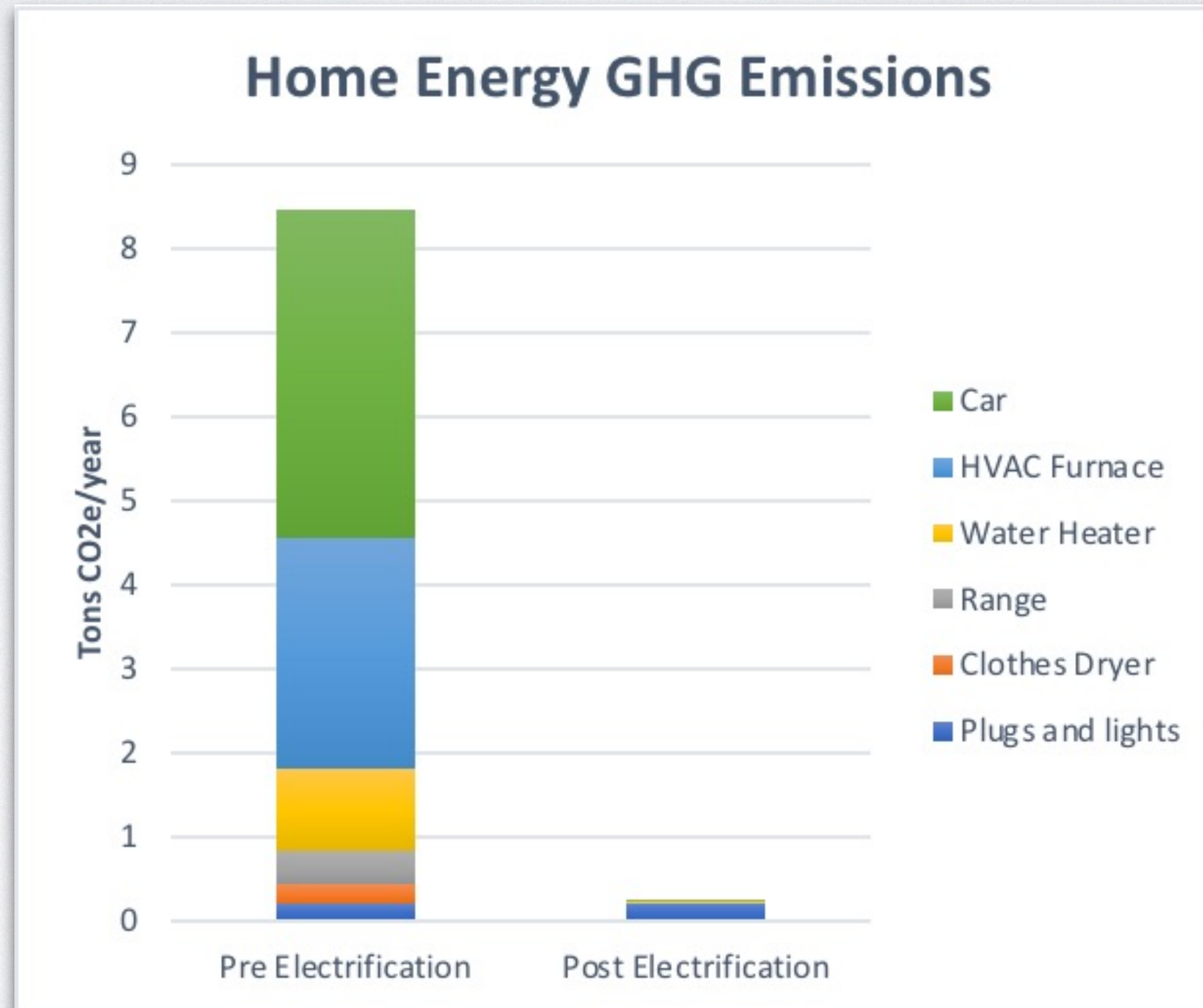
Replacing all fossil fuel appliances in the building:

- #1 gas furnace
- #2 gas dryer
- #3 gas range
- #4 gas water heater
- #5 gasoline for car

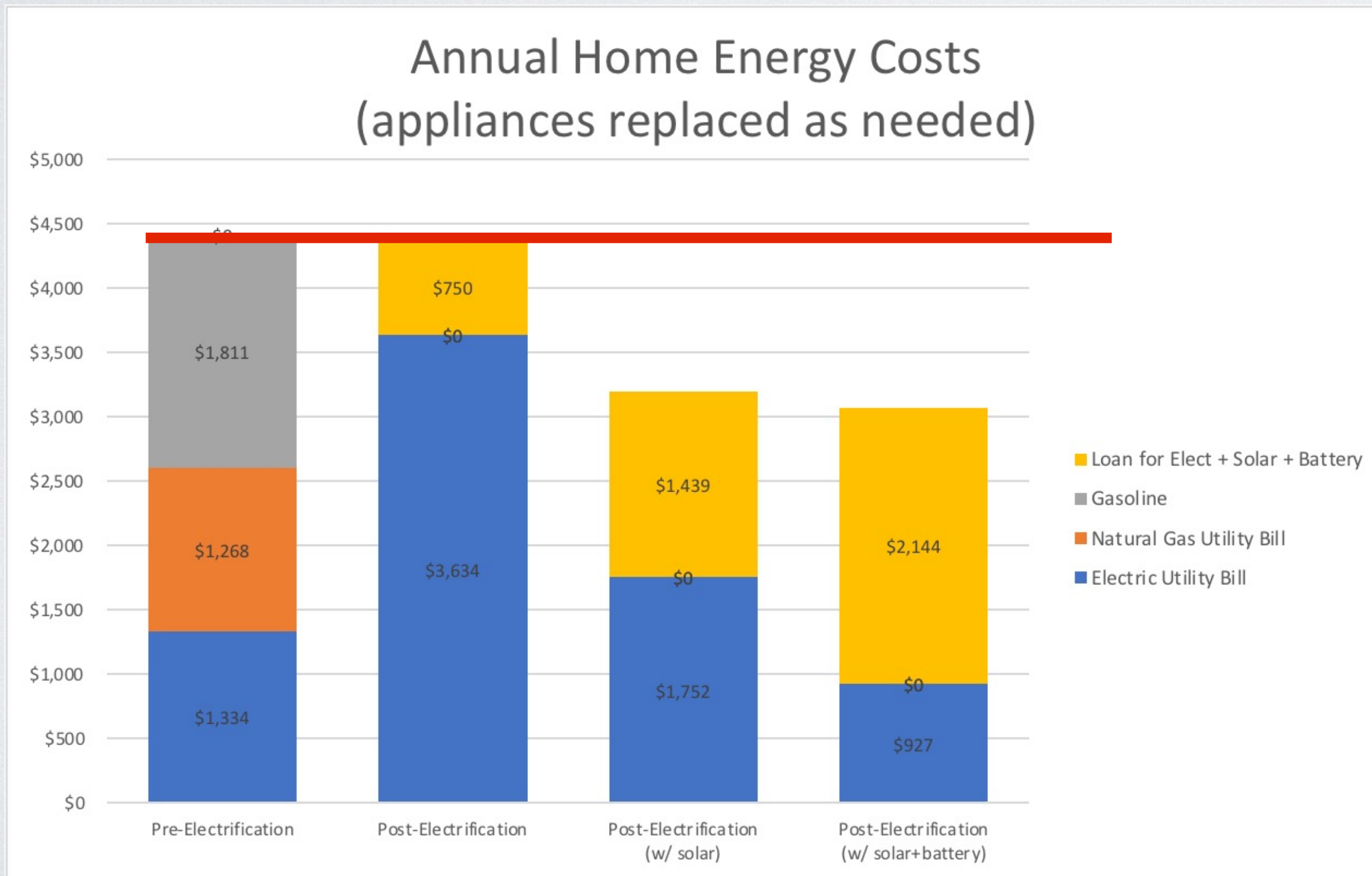
...with high efficiency electric alternatives

- Rooftop solar (at \$0.05–0.10 per kWh) makes all-electric home conversions affordable
- Battery backup systems make all-electric homes reliable during grid outages

ELECTRIFICATION NEARLY ELIMINATES BUILDING GHG EMISSIONS



WHAT DOES IT COST TO ELECTRIFY?



Annual Home Energy Costs	Pre-Electrification	Post-Electrification	Post-Electrification (w/ solar)	Post-Electrification (w/ solar +battery)
Electric Utility Bill	\$1,334	\$3,634	\$1,752	\$927
Natural Gas Utility Bill	\$1,268	\$0	\$0	\$0
Gasoline	\$1,811	\$0	\$0	\$0
Loan for Elect + Solar + Battery	\$0	\$750	\$1,439	\$2,144
Total	\$4,414	\$4,384	\$3,191	\$3,071

SCENARIO BUILDING ASSUMPTIONS

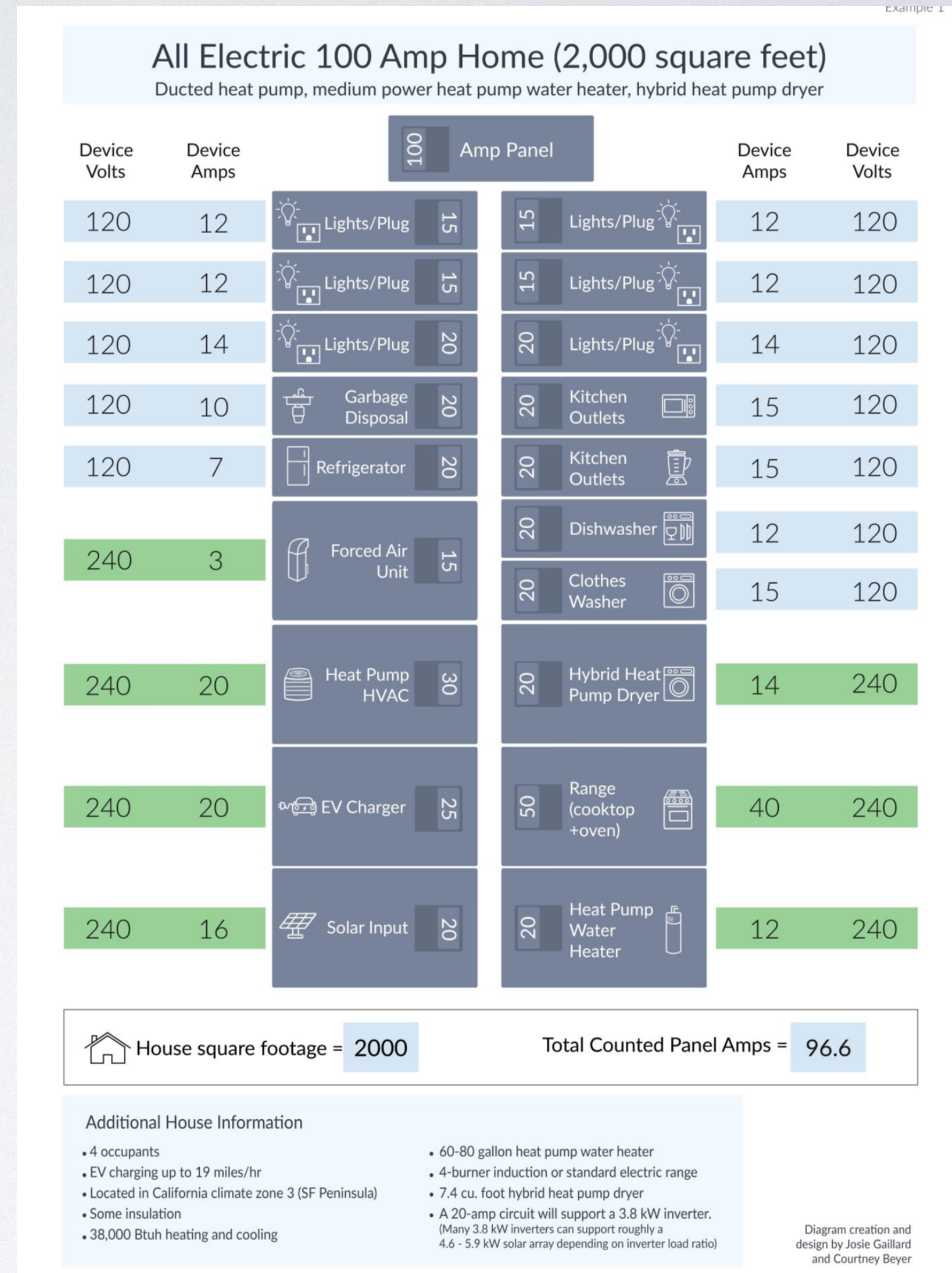
- Typical single family home in Menlo Park, California
- Built mid-century with some energy efficiency upgrades (attic insulation and duct insulation) but no major remodel
- 1,500 sq feet
- 100 amp electrical service
- Home owner has good credit

SCENARIO APPLIANCE ASSUMPTIONS

	Starting State	End State	Conversion Yr
Water heating	gas water heater	heat pump water heater	3
Space heating	gas furnace	heat pump HVAC	5
Clothes drying	gas dryer	hybrid heat pump dryer	7
Cooking	gas range	induction range	8
Vehicle fuel	gasoline	electricity (via home EV charger)	1
Solar	0 kW	5.8 kW	1
Stationary battery	0 kWh	13.5 kWh	3
Electric service	100 amps	100 amps	n/a

“AMP DIET” for 2,000 sq ft home

- For homes with 100 amp electrical panels
- Helps avoid ~\$3,000 electric panel upgrade
- Favors efficient devices w/ low rated amps
- Provides roadmap for building owner
- Helps guide tradespeople



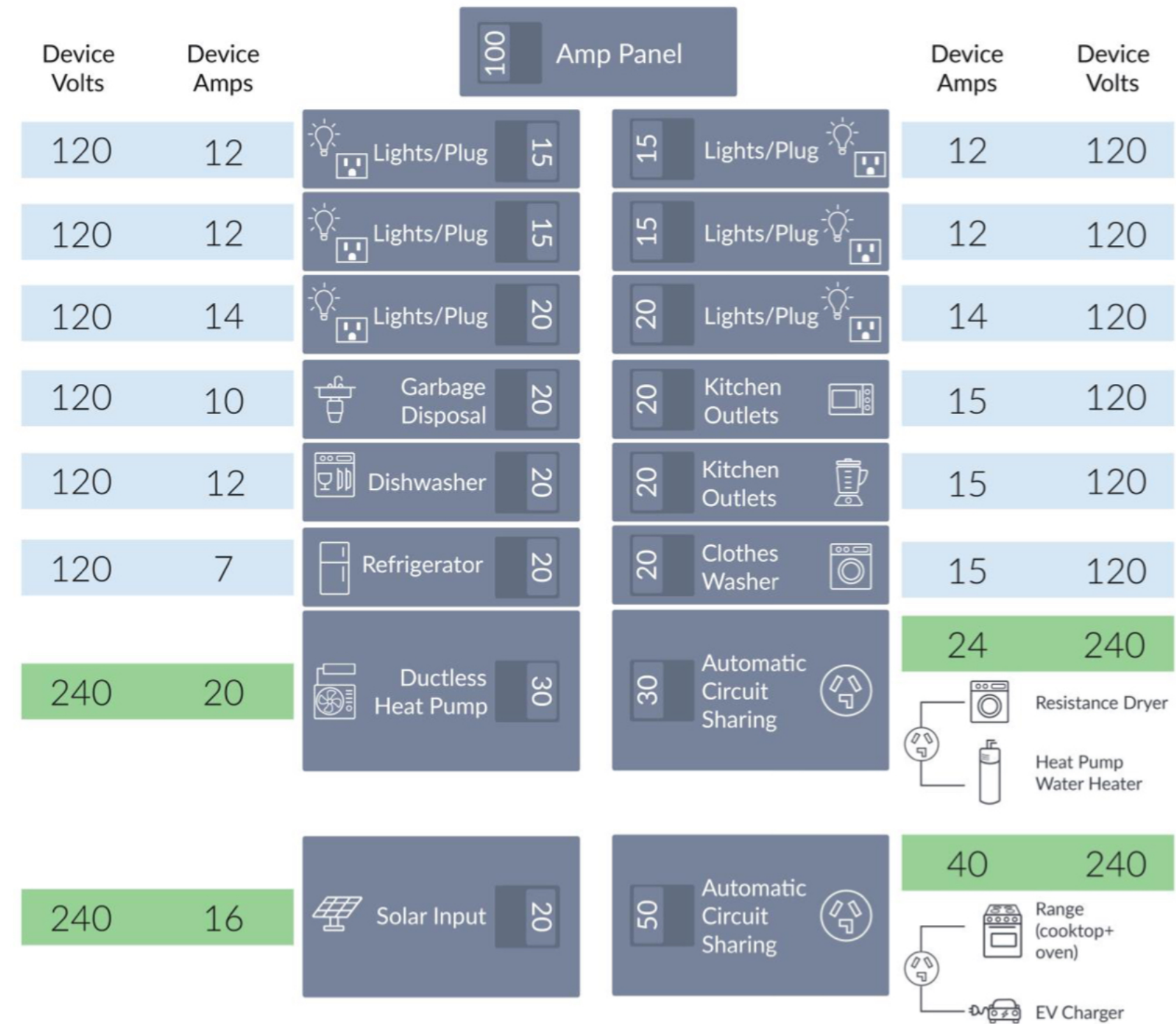
“AMP DIET” for 3,000 sq ft home

- For homes with 100 amp electrical panels
- Uses “circuit sharing” devices like plug-in smart splitter *Neocharge* or hard-wired version *SimpleSwitch*
- Still easy to avoid ~\$3,000 electric panel upgrade

Example 2

All Electric 100 Amp Home (3,000 square feet)

Two “automatic sharing” circuits, ductless mini split heat pump, resistance dryer, high power heat pump water heater



House square feet = **3000** Total Counted Panel Amps = **95.6**

- Additional House Information**
- 4-6 occupants
 - EV charging up to 38 miles/hr
 - Located in California climate zone 3 (SF Peninsula)
 - Some insulation
 - 48,000 BTU heating and cooling
 - 40-80 gallon heat pump water heater
 - 4-burner induction or standard electric range
 - 7.4 cu. foot standard resistance dryer
 - A 20-amp circuit will support a 3.8 kW inverter. (Many 3.8 kW inverters can support roughly a 4.6 - 5.9 kW solar array depending on inverter load ratio)

Diagram creation and design by Josie Gaillard and Courtney Beyer

February 22, 2021

A HOWTO GUIDE FOR ELECTRIFICATION



- Just released by Redwood Energy and Menlo Spark
 - Electrification solutions for existing buildings
 - Product lists
 - Case studies from across the country
 - Amp diet info
 - Cost examples
-
- <https://redwoodenergy.net/wp-content/uploads/2021/02/Pocket-Guide-to-All-Electric-Retrofits-of-Single-Family-Homes.pdf>

APPLIANCE INSTALLATION COST ASSUMPTIONS

New Electrification Equipment	Capital Costs - Electrification												
	Electric Equipment Installation							Equivalent Gas Equipment Installation				Premium: Electric v. Gas	
	Included in Project?	Equip Cost	Labor Cost	Wiring Cost	Permit Cost (Fee + Labor)	Installed Cost Before Incentives	Incentives	Total Cost Electric	Equip Cost	Labor Cost	Permit Cost		Total Cost Gas
Electric service upgrade	no	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
New electric subpanel	no	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Heat pump water heater	yes	\$1,300	\$1,200	\$400	\$500	\$3,400	(\$2,500)	\$900	\$600	\$400	\$400	\$1,400	(\$500)
Heat pump HVAC	yes	\$5,000	\$4,000	\$550	\$1,000	\$10,550	\$0	\$10,550	\$3,000	\$2,000	\$500	\$5,500	\$5,050
Hybrid Dryer	yes	\$1,500	\$0	\$300	\$0	\$1,800	\$0	\$1,800	\$700	\$100	\$0	\$800	\$1,000
Induction Range	yes	\$3,000	\$0	\$600	\$0	\$3,600	\$0	\$3,600	\$1,200	\$100	\$0	\$1,300	\$2,300
EV charger	yes	\$500	\$0	\$600	\$400	\$1,500	\$0	\$1,500	\$0	\$0	\$0	\$0	\$1,500
TOTAL		\$11,300	\$5,200	\$2,450	\$1,900	\$20,850	(\$2,500)	\$18,350	\$5,500	\$2,600	\$900	\$9,000	\$9,350

ROOFTOP SOLAR ECONOMICS

Solar System Size	5.8 kW
<u>Solar System Price*</u>	<u>\$2.00</u> per watt
Total Price of Solar System	\$11,600
<u>Federal Tax Credit - 26%</u>	<u>\$3,016</u>
Solar System Cost After Tax Credit	\$8,584
Average Full Sun Equiv	1,600 hours per
Average Daily Insolation	4.38 hours per day
Daily Solar Array Output	25 kWh per day
Annual Solar Array Output	9,280 kWh per year
Solar System Life	25 years
Derating Factor due to Aging	20%
<u>Derating Factor from Size Clipping</u>	<u>7%</u>
Derated Annual Solar Array Output	6,922 kWh per year
Solar Electricity Cost (ex. loan)	\$0.05 per kWh
Annual Loan Payment on System**	\$689
Solar Electricity Cost (inc. loan)	\$0.10 per kWh
<u>Avoided PG&E Electricity Cost</u>	<u>\$1,661</u>
Annual Savings from Solar	\$973

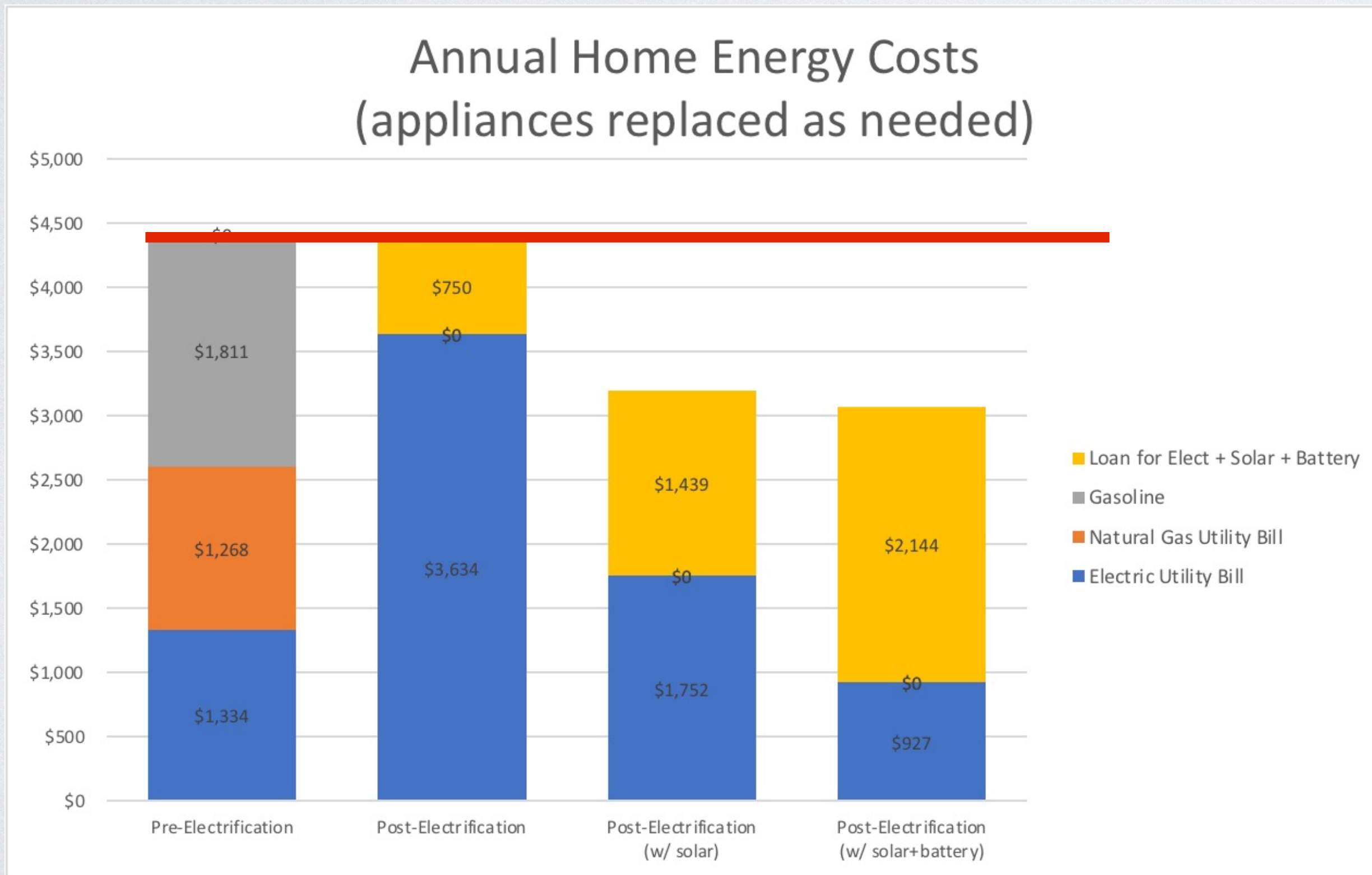
* Note: \$2.00 per watt installed price taken from Tesla's website

** Assumes 5% interest rate and 20 yr term

FINANCE AND OTHER KEY ASSUMPTIONS

- Loan term: 20 years
- Loan interest rate: 5% fixed
- Electrification costs reflect actual prices/quotes
- Rooftop solar installation cost = \$2.00/watt
- Stationary battery installation cost = \$880/kWh
- Battery capacity reserved for outages = 35%
- Federal tax credit = 26%
- CCE subsidy = \$2,500 for HP water heater
- End state electric rate: PG&E EV2-A
- Natural gas rates increase by 84% (average) over 20-year term of loan
- 12,000 vehicle miles per year
- 120 degree F target temp for water heater
- 5 laundry loads per week
- 14.5 range “burner hours” per week

WHAT DOES IT COST TO ELECTRIFY?

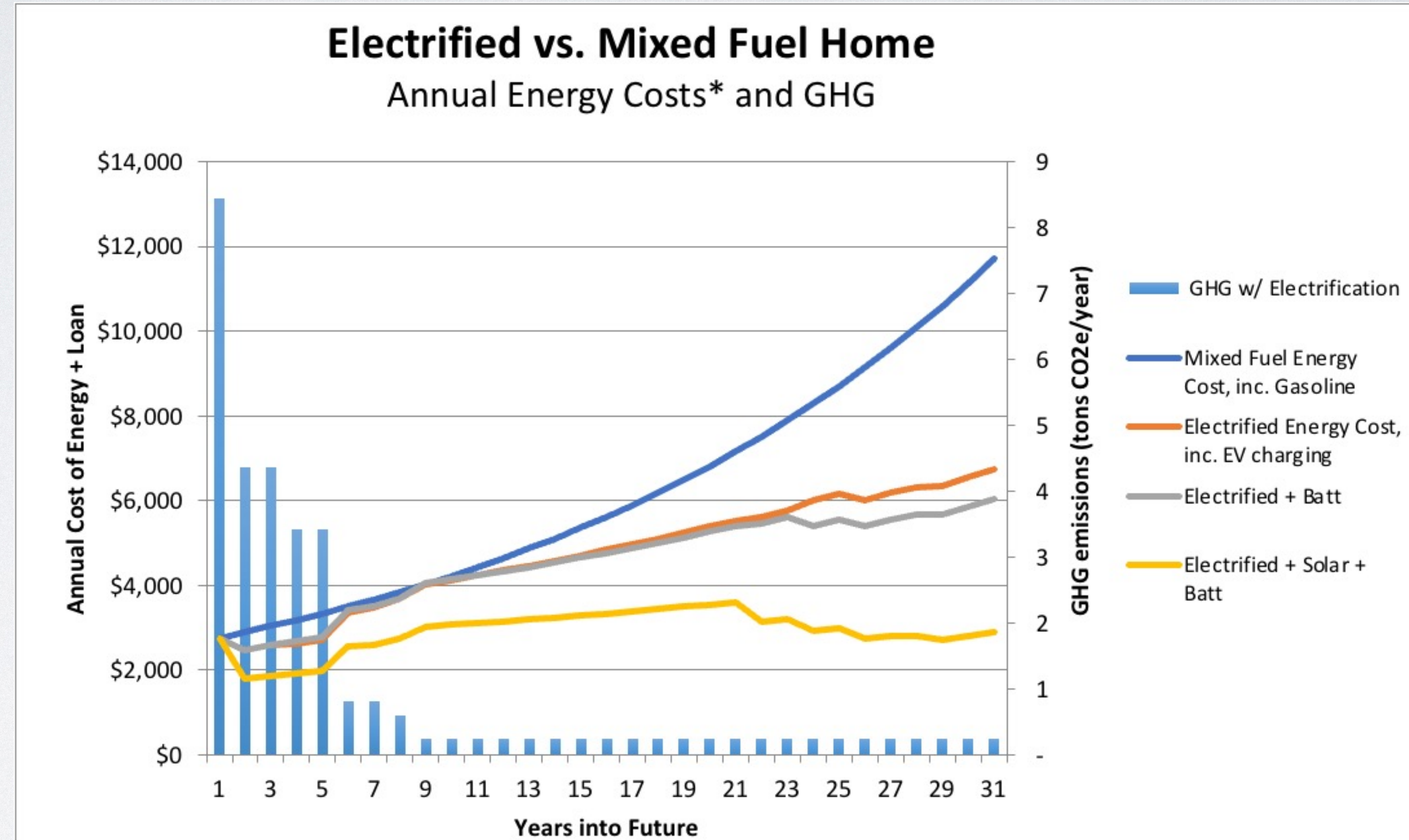


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Total	\$4,414	\$4,384	\$3,191	\$3,071

HOME BUDGET IMPACT OF NOT ELECTRIFYING

Key Variables

Interest rate	5.0%
Loan term	20 yrs
Natural gas rate multiplier from inputs b	1.84
Starting Electric Rate	E-1
Starting Electricity Rate (Average)	\$0.24 per kWh
New Electric Rate	EV2-A
Include solar?	yes
Solar system size	5.8 kW
Solar system price	\$2.00 per Watt
Include battery?	yes
Battery system size	13.5 kWh
Battery system price	\$880 per kWh
Battery capacity in reserve for outage	35%
Upgrade to main panel req'd?	no
Permit streamlining for electrification?	no
Permit cost reduction for electrification	80%
Federal tax credit applicable?	yes
Federal tax credit rate	26%
Incentive for main panel upgrade	\$0
Incentive for subpanel upgrade	\$0
Incentive for HP water heater	\$2,500
Incentive for HP HVAC	\$0
Incentive for HP dryer	\$0
Incentive for electric cooking range	\$0
Incentive for EV charger	\$0

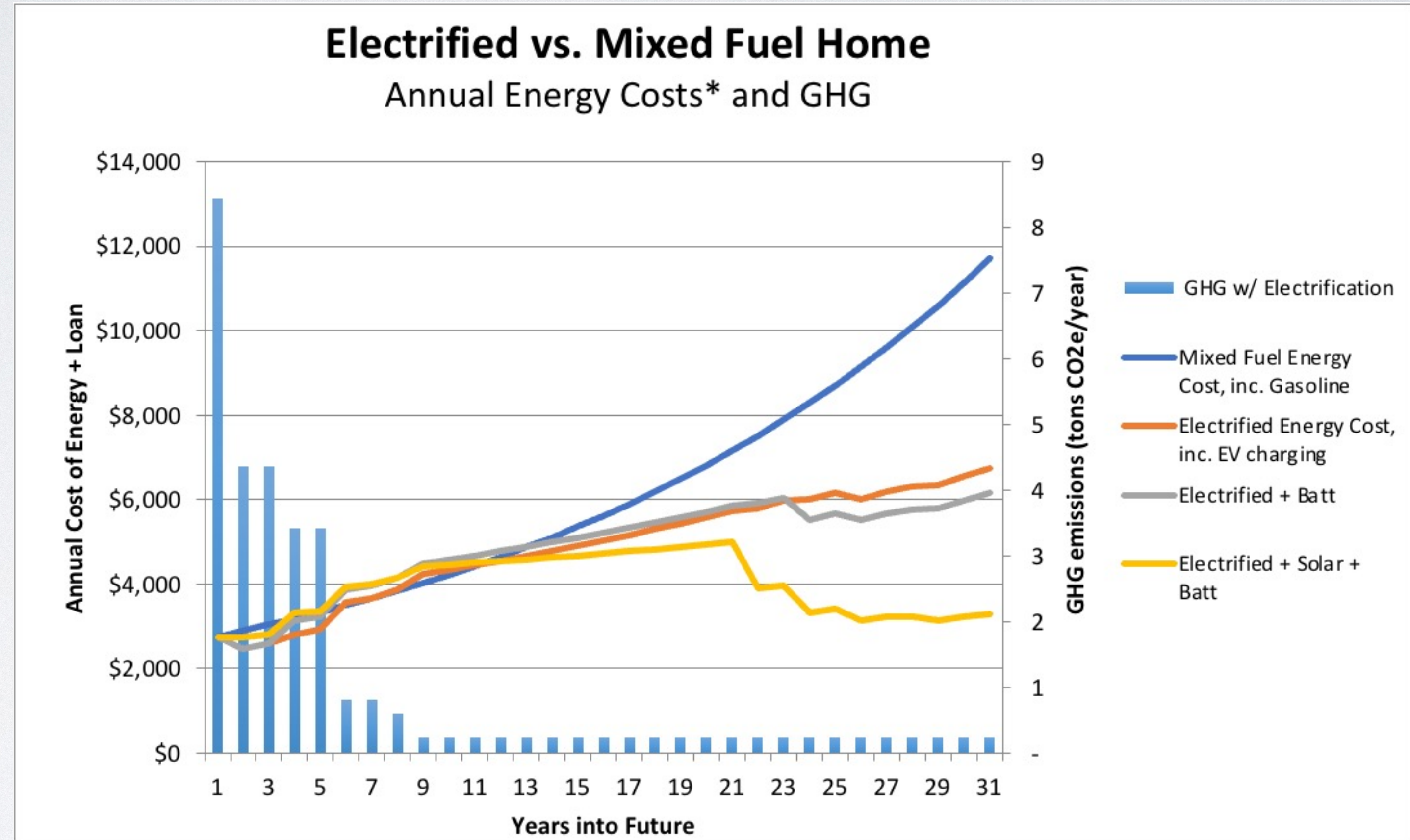


* Annual energy costs for Electrified Home include utility electricity payments + loan payment on incremental capital investments for electrification. Escalation rate assumptions for electricity and natural gas rates in PG&E territory and gasoline prices are all taken from the California Public Utilities Commission Report entitled "Utility Costs and Affordability of the Grid of the Future: an Evaluation of Electric Costs, Rates and Equity Issues, Pursuant to P.U. Code Section 913.1", February 2021, p. 73.

ELECTRIFYING VS. BAU W/O SUBSIDIES

Key Variables

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Loan term	20 yrs
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Battery system size	13.5 kWh
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Incentive for HP dryer	\$0
Incentive for electric cooking range	\$0
Incentive for EV charger	\$0



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KEY FINDINGS

- **Electrification is cost neutral from day one to the end customer if:**
 - Financed
 - Paired with roof-top solar
 - Installation costs are competitive
 - Amount financed is “premium” for electrification over gas appliances
- Panel saving “amp diet” concept is key to avoiding \$3,000+ electrical service upgrade
- Capital costs for electric appliances are currently higher than equivalent gas appliances
- Solar is so inexpensive that it floats the economics of electrification
- Adding a battery pays for itself due to “duck-head” savings on PG&E’s EV2-A rate

WHAT CAN WE LEARN FROM ROOFTOP SOLAR?

- Installation costs will come down with volume
- Installer training is key to quality and cost
- Streamlining permits is key to reducing costs
- Stepping down subsidies by volume (vs. time) creates prompt demand, injects urgency and imposes discipline on installer market
- Financing will move electrification from something only wealthy people can afford to something most people can afford

KEY LEVERS FOR POLICY MAKERS AND UTILITIES

#		Who
1	Low interest financing	private sector, PCE, County?
2	On-bill financing	PG&E, PCE
3	Extra support for low-income households	?
4	Equipment rebates	PCE
5	Installer training	PCE, County
6	Public education	PCE, County, Cities
7	Permit streamlining	Cities, County, State
8	Favorable electricity rates	PCE, PG&E, CPUC
9	City ordinances	Cities

WHAT ELSE DO WE NEED?

- Low-interest financing solutions
- Financing solutions for customers with poor credit
- On-bill utility financing
- Education on using “amp diets” to avoid panel upgrades
- Permit streamlining and fee reduction
- More developed and competitive installer market

MYTHS

- Heat pumps don't work well in the cold
- My house will be cold if I electrify
- Everyone will need an expensive electrical panel upgrade to electrify
- Electrifying is only affordable for the wealthy
- Electrifying puts me at increased risk during power outages

POTENTIAL POLICY PUSHBACK

Issue	Addressed with...
Cost too high	On-bill financing, avoiding panel upgrades, rooftop solar, permit simplification, utility subsidies
Resiliency risk	On-site battery back-up system
Why us? We are a drop in the bucket	Even small cities can provide leadership for catalyzing change, e.g. Reach Codes
Too much effort - don't want to change	Utility-offered concierge service, public education, installer market education and development

Research and Modeling:

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Tom Kabat
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APPENDIX

LOAD ANALYSIS

