



SUSTAINABILITY & CLIMATE ACTION PLAN

October 22, 2020

All Electric Homes 101 Webinar

45 attendees, 85 registered

Questions and Answers

1. How long does it take for a residence to go all electric? If someone started today, how long would it take?
 - A. Home electrification is a journey, not a sprint. It takes time, and you don't have to electrify all at once. If you are going to do a major remodel, it might make sense to electrify all at once, but otherwise, you can electrify your home in phases over multiple years. The Home Efficiency Genie program (efficiencygenie.com) can help you come up with an electrification strategy. For home appliances, we recommend that you find out the age of your current gas appliances and start researching contractors and electric appliances, so that you are ready to switch them out when it comes time to replace your gas appliances. We recommend that you get at least two quotes for comparison.

2. What is the biggest barrier to people switching to electric homes?
 - A. From a customer perspective, cost is an issue. Even before you switch appliances, you need to make sure that a home's existing electric panel is sufficient to meet the additional electricity needs. Upgrading an electric panel can cost around \$3,000. For homes that already have a level 2 electric vehicle charger or solar system, the panel most likely has already been upgraded. Another challenge is in finding and selecting contractors. It can be difficult to determine which contractors are experienced in installing heat pump water heaters or heat pump HVAC systems. We now have a list of experienced contractors available on our website at cityofpaloalto.org/hpwh (go to "Resources" tab in the table near the bottom of the page). Palo Alto has been collaborating with the Building Decarbonization Coalition and other agencies to launch "The Switch is On", a consumer-facing campaign to support beneficial home electrification. The website switchison.org has just launched, and includes a contractor portal where you can look up contractors that serve your area: <https://www.cleanenergyconnection.org/contractor-directory>.

3. Does Palo Alto have a perspective on solar batteries (e.g. Powerwall)?
 - A. Currently, we have a little over 20 battery storage systems installed in residential homes in Palo Alto, and they are all Powerwalls. Typically, people who want a full home battery backup will have two Powerwalls installed, because each one covers about 13 ½ kilowatt-hours of energy and a typical home uses about 20 kWhs of energy per day. We offer battery storage discounts through our Sunshares Solar Group Buy program that is available now. For questions about the solar and storage group-buy program currently underway (through November 30), email sunshares@cityofpaloalto.org and/or visit BayAreaSunShares.org.
4. What livability problems, if any, have homeowners who have gone all electric had?
 - A. None so far. An induction cooktop can be cleaned much more easily compared to a gas range. Air quality has been a concern in the Bay Area lately, and you can change the filter with one that has a higher MERV rating for improved air purification. In the future, EVs could serve as a backup power source during a power outage.
5. How should we answer questions from people who are concerned about electric power shutoffs? What happens if their electricity is shut down? What is our response to residents?
 - A. This has been a very difficult summer when it comes to power outages in California. There have been public safety power shutoffs throughout the state of California. Some Palo Alto customers experienced rolling outages that were the first that we've had since the early 2000s. The City of Palo Alto Utilities Department's number one goal is to provide safe and reliable services. This is a top priority – minimizing or avoiding power shutoffs is a high priority. For customers who are worried about shutoffs, and not having power to use their appliances, there are alternatives – such as battery backup systems. Depending on the type of backup system you'd like, there are energy storage solutions under \$2000 that are sufficient to power a few appliances (phone, computer, refrigerator). If you want to have a whole-house back-up power system, those are more expensive. Diesel/gas generators are relatively inexpensive, but they are noisy and polluting when in operation. Improper use of diesel generators can also pose risk of carbon monoxide poisoning, as more than half of the 15 deaths associated with Hurricane Laura were caused by improper use of portable generators. There is a real need to focus on resilience. The City of Palo Alto Utilities has some solar storage educational resources available to customers (Sunwork/Sunshares Group Buy Program). There is a lot of work going on in Palo Alto and across the state to address these issues. The California grid operator is working to eliminate the possibility of future rolling outages, and we are actively working on adding a second transmission line in Palo Alto. Palo Alto's electric system has a high level of reliability compared to most of the country and ensuring good maintenance and investment in the system will be critical as more homes electrify. Still, power outages will sometimes continue to affect all-electric as well as mixed-fuel homes in the future. Most appliances and equipment that use gas also need electricity to operate or to operate safely. Using natural gas appliances during a power outage is also not safe, as most will not function safely when the power is off.

6. Is the City Utility interested in investigating local energy storage so we can have power during the power outages because of PG&E cut offs?
 - A. Yes, we're interested both in energy storage and back-up generation – resilience and reliability. Space and cost are always the primary issues. One of the things we're focusing on right now is supporting people who are interested in installing their own storage and their own back-up generation. The City offers resources to customers who want to invest in home storage solutions. We are also partnering with commercial customers that are interested in microgrids as a resiliency solution. The City is not pursuing local utility scale storage solutions at this time but will continue to monitor various technologies and cost trends. With regards to the PG&E power safety shut-off program, that program generally affects less urban areas of California – places where high winds can affect transmission lines or distribution lines that could swing into trees and start fires. There haven't been many power safety shut-offs in dense urban / suburban areas in the Bay Area, with the exception of the Foothills that surround the Bay Area. We're trying to provide as much support as we can for energy storage for all types of customers that face outages. The power safety shut-off program is intended to be a temporary measure, and in the coming years, PG&E has been mandated to make various improvements in their system that will remove the need to have those shut-offs in the long-term.

7. Do you recommend rooftop solar paired with an electrification project?
 - A. Yes, a great time to think about electrifying is when you are adding solar or vice versa. If you do want to put solar on your roof, think about your current AND future electricity needs. A typical home uses about 20 kWh of energy per day. A heat pump water heater uses about 5 kWh per day. We get about 5 hours of bright sunlight per day. You need about 1 kW of extra PV system size for every 5 kWh you add per day.

8. Here is a new video on how to electrify without upsizing the home electric panel:
<https://www.youtube.com/watch?v=XQJzoP2br1Y>
 - A. Thank you for this resource.

9. For retrofits, are there heating systems that can be less expensive to add and reduce the use of gas for heating.
 - A. Mini split systems can be used to supplement your current gas furnace. You can mount multiple indoor units so you have better control of specific areas of the home to heat. This is very useful if you don't need to heat your whole house at the same time. For example, you can add a mini split system to a single room or a single section of your home.

10. What are the advantages or disadvantages of mini splits vs. a ducted heat pump? Can a mini split heat an entire 2000 sq. ft. home?
 - A. A mini split can be adapted to any size home. Sometimes you may need more than one compressor, with multiple wall-mounted units inside the house that provide the heat exchange. A ducted system – if you want a traditional system like what you have now – can use the existing infrastructure in your home and is a little lower cost than a mini split system. However, due to potential air leakage in the ductwork, you may need to pay more

for heating a home and for maintenance. Ducted systems tend to be less efficient because there is heat loss in the ducts.

11. In this climate, is it advisable to include a backup gas furnace (in addition to the heat pump heater/AC) for the coldest days?
 - A. This is not necessary in our climate and isn't necessary in harsher climates either. In the Bay Area, a heat pump does not have any problems keeping up.

12. Is it permitted to install heat pump/AC units in your side yard that are less than 9 feet between the exterior wall and the property line?
 - A. This is really a zoning question – are we installing it in the main house or in an ADU (Accessory Dwelling Unit)? The answer varies depending on where it is being installed. The Palo Alto Planning Department allows for installation of a heat pump water heater on the exterior side of the building, as long as it's not within the setbacks and meets requirements of the noise ordinance – there is a certain decibel level that you cannot exceed when you install it on the exterior. One way to mitigate this is to install it in an exterior closet, which cannot be installed in the setback in the zoned areas. The side yard setback varies, depending on where you are located within the City. The current heat pump water heater systems are very quiet - in the less than 50 decibel range - and are typically much quieter than older air conditioning systems.

13. Since a heat pump requires a water tank, and I already have a gas tankless system, then I would be adding the water tank, correct? I still like the idea though.
 - A. Yes, replacing a gas tankless system with a heat pump system does require a tank. A heat pump water heater is a tank system, so it would be similar to a traditional gas tank. They look similar and they are sized similar, so you would need something in that same space requirement as you would need for a traditional tank.

14. In Europe they run the induction cooktops at 360 volts. At what voltage can we run them in Palo Alto?
 - A. For induction cooktops with multiple burners, they typically run at 240 volts. You do need a 240V circuit to run a full range induction cooktop. Induction cooktops with a single burner typically run at 120 volts. There are also many choices for free standing induction ranges.

15. Are there other rebates besides for a heat pump water heater?
 - A. City of Palo Alto Utilities (CPAU) currently offers a Heat Pump Water Heater (HPWH) rebate to promote the replacement of gas water heaters with HPWHs at cityofpaloalto.org/hpwh. CPAU also offers a Home Electrification Readiness assessment through the Home Efficiency Genie program to help homeowners evaluate their energy use and assess the master electric panel for home electrification. Over the next 12 months, CPAU plans to launch a broader suite of electrification incentives to support electrification of existing buildings. These incentives could cover heat pump HVAC, induction cooking, and high efficiency electric clothes dryers. In addition, CPAU plans to offer a rebate to homeowners who install an EV charger and upgrade their master electric panel at the same time, which makes

additional electrification measures easier to implement. Having a menu of home electrification incentives gives homeowners the option to either replace home appliances one at a time as they reach the end of useful life, or do it more comprehensively as part of a remodel.

16. How much does it cost a resident for a Home Efficiency Genie audit?

A. Your health and safety, as well as that of our residents, is of the utmost importance to the City of Palo Alto Utilities and the Home Efficiency Genie program team. To that end, we have temporarily suspended all in-home assessments until further notice as we adhere to the mandated 'Shelter in Place' provisions and CDC guidelines. Customers may receive free phone advising services by contacting the Genie. Normally, a Home Efficiency Genie audit is \$149 for Palo Alto residents. In November, we will be launching a virtual program that only requires a cell phone for a professional energy advisor to do a virtual assessment. The cost of the virtual assessment will be \$49, which includes a home electrification readiness assessment. In the meantime, we have started a waitlist for customers interested in scheduling an assessment once restrictions are lifted, as well as for customers interested in the soon-to-be-launched virtual assessment. We will continue to offer our phone-based Energy Advisor service, providing you access to ongoing expert and unbiased advice to help you achieve your home comfort and efficiency goals. Please call (650) 713-3411 or email advisor@efficiencygenie.com for support or visit efficiencygenie.com.

17. What is the split between gas usage versus distribution leakage that makes up the 32% greenhouse gas emissions? (slide 4)

A. In 2018, natural gas use in buildings combined with natural gas leakage accounted for 32% of Palo Alto's community greenhouse gas emissions. Of the 32%, about 1.5% is from distribution system leakage within Palo Alto city limits (or about 5% of total natural gas emissions) <https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2020/05-20-2020-special/item3-slides-naturalgasleaks.pdf>

18. When you express greenhouse gas contributions, do you correct for their potency difference?

A. In terms of global warming potential – which allows comparisons of the global warming impacts of different gases relative to carbon dioxide (CO₂) - yes, we do. We correct for different global warming potential on a 100-year time frame, or contributions over 100 years.

19. How many grid tie-ins does Palo Alto have to the greater transmission system?

A. Palo Alto has three lines that tie into the greater grid, all at one interconnection point.

20. When will we get a second interconnection?? Stanford has two.

A. Utilities staff is working with the State grid operator and PG&E on this issue, but we do not have a timeline to share yet.