

Resources from the Chat from BayREN's December 7, 2023 Regional Forum

Residential Electrification in the Real World: Navigating Panels and Permits

Disclaimer: We have removed duplicates and edited for readability and to remove personal information but have not fact-checked the content of this document. Resources, comments and ideas were provided by attendees as well as presenters.

List of resources that were shared in the chat

- Today from Canary Media - Yes It's Possible to Electrify a Home on Just 100 Amps
<https://www.canarymedia.com/articles/electrification/yes-its-possible-to-electrify-a-home-on-just-100-amps>
- SVCE has an RFP out to get a guide developed for City Building Officials to assist them in working with customers to avoid unnecessary service upgrades. If interested, you can find it at
http://svcleanenergy.org/wp-content/uploads/Service-Optimization-Guides-RFP_Updated-2023.11.29.pdf
- Resources from the City of San Carlos:
 - Home electrification:
https://www.cityofsancarlos.org/city_hall/departments_and_divisions/city_manager/sustainability/home_electrification.php
 - EV charging:
https://www.cityofsancarlos.org/city_hall/departments_and_divisions/city_manager/sustainability/electric_vehicle_charging.php
 - Business resources:
https://www.cityofsancarlos.org/city_hall/departments_and_divisions/city_manager/sustainability/business_resources.php
- The California Energy Commission has a Building and home Energy Resource Hub for homeowners, contractors, and local government reps to help with the electrification process. Here is the link to the hub, click on the page that relates to you -
<https://www.energy.ca.gov/programs-and-topics/topics/building-decarbonization/building-and-home-energy-resource-hub>
- QuitCarbon.com provides a free concierge service to help navigate the electrification process. Also the company HEA provides a free analysis tool (hi.hea.com) to help analyze your electrification options, funded by PG&E. (HEA can not know your panel size. From our investigations, neither can PG&E nor anyone else. This is unfortunate.)
- The City of San Jose held a series of home electrification webinars with Sean Armstrong of Redwood Energy last year. One of the webinars we did discussed ways to avoid panel upgrades in home electrification: <https://youtu.be/3hrF1yeUpT8>
- See <http://www.switchison.org> to find incentives and contractors near you. It's an initiative of the nonprofit the Building Decarbonization Coalition (<http://www.buildingdecarb.org>).
- The Genius smart panel looks really interesting. Learning more about it for our home.
<https://kobensystems.com/genius/>
- HPWH Permit Resources available for download: <https://www.bayren.org/building-dept-tools-guides/heat-pump-water-heaters>
 - This includes the electric load spreadsheet.
- look at the Harvest Thermal system that does both space conditioning and water heating from the same SANCO2 unit. <https://www.harvest-thermal.com>
- Energy-Smart Homes has great incentives for ADUs, single family, and multifamily buildings ready to ditch all gas end uses and update to all-electric advanced energy systems
https://caenergysmarthomes.com/alterations/#_alteration-incentives

Discussion from the chat:

- Does PG&E / other utilities provide the homes service capacity on their website? I haven't been able to find it. It feels like this is information that should be readily available to smoothen the process
 - No. We have been urging them to do so for everyone. But you can get the "remaining capacity" of your existing panel through an analysis of your smart meter data. This is one of the stats we provide via hi.hea.com (HomeIntel).
- A high quality induction cooktop is also 50 AMP.
 - True, but you can also get portable cooktops if you're a renter that have 1-2 burners that are 120v plug-ins. There are two Energy Storage Equipped aka induction stoves with batteries built in coming out in 2024-2025 from <https://www.channingcopper.com/> and <https://www.impulselabs.com/>
 - We have a high quality (Bosch) 30 amp induction cooktop and my chef/wife has never wanted more power. She just got an induction-capable wok and it works great.
 - I love my 50 amp Bosch 5-"burner" cooktop....but if I had a 100 amp panel, I'm sure a 30 amp unit would work.
- In my experience soliciting bids for a heat pump, over half of them are insisting on the backup heat strips.
 - Especially for us in the Bay Area, heat pump heating and cooling should almost never need backup heat strips. It would take -10 degree weather for electric resistance heat strips to start to outperform a heat pump in terms of efficiency.
- Imagine if a new smart subpanel box is installed adjacent to the existing circuit breaker panel. What do I mean by "Smart"? Two things: 1) It ensures that the total load on the utility will never be exceeded. 2) It temporarily shuts off low priority demands if and when the total load is approaching the utility load limit. This new subpanel has six 220 Volt circuit breakers and a control board. Each of the circuit breakers has a relay paired with it. The 220 cables connected to each of the appliances are connected to the six circuit breakers in priority order. A passive digital Ammeter is attached to the cable connecting the home to the utility. If the ammeter detects that the home is approaching more than the specified total load (e.g. 100 Amps) then the lowest priority load (e.g. Charging the EV) will be turned off until the total load drops. This would ensure that total demand would never exceed capacity, and it would solve the insufficient breaker space issue for all 6 of our electrification needs.
- To understand the incremental cost of Watt Diet Strategies, take a look at this Peninsula Clean Energy presentation. Many of the strategies are big cost savers (eg circuit splitters, and right sizing the power of equipment) <https://www.peninsulacleanenergy.com/wp-content/uploads/2023/02/Design-guidelines-for-home-electrification-v021023.pdf>
- Since most (about 90%-95% I hear) replacement gas for gas water heaters are installed without pulling a permit. And since 120V plug-in heat pump water heaters are safe from fire hazards, explosive gas hazards, and carbon monoxide poisoning risks, should jurisdictions loosen (or eliminate) permitting requirements for 120V in order to naturally create more safety? What might be the pros and cons of that type of policy? Where might be the middle ground that maximizes total community safety? E.g. simplifying free permit applications to the sentence " replacing gas water heater with 120 Volt plug in heat pump water heater in same location." No plan check would be required. An inspection would be on a lottery basis to encourage following installation rules. And an inspection could be requested by customer.

- A water heater permit should be "over-the-counter" or quickly issued via electronic means. There should not be any plan review associated with all the permits we're discussing as part of this forum. However, I disagree that there should be no inspections.
- Sadly I feel like DBIs rarely feel the urge to loosen permitting requirement. This kind of push should have to come top down from the municipalities. (DBI = Department of Building Inspection (different jurisdictions use different names; a.k.a., building department))
- SAFETY BEFORE COST.
- I'm from France, we do have safe building, less fatality rates than in the US and very little to no residential building inspections
- Yes to looking world wide for good permitting examples! I like to look at the Australian solar examples to inspire simplicity and low "soft cost" installations.
- there are safety issues with gas heater installs w/r/t carbon monoxide and backdrafting of pollutants, but that would not be an issue with HPWHs
- I would like to hear more about the induction capable WOK?? this is fascinating.
 - Induction woks: <https://foodsguy.com/best-woks-induction-cooktop/>
 - Also see <https://switchison.org/cooking/appliances/>
 - Flat-bottom woks are very common. Nearly all woks are made of steel. (If a magnet sticks, it will work on induction.) So nearly all woks are induction capable. ... But if you specifically prefer a round-bottom wok and larger area that gets hot (which is not always the best, depending on the dish), there are round-bottom induction hobs. You can find them on some models of range, or as standalone plug-in countertop units.
- My opinion on the Permit Supplement Template I initially developed has changed toward it being not a permit application document, but just a best practices guide or code compliance guide issued to the applicant to guide them on making a code conforming installation. But not be a step in the application process. I now favor permits simplified down to project scope and address. Scope is the sentence: "Replacing gas water heater with ___ volt heat pump water heater in same location." Then there is no plan check required and a field inspection verifies proper installation.