

Does Rooftop Solar Still Make Sense?

Making sense of changes to the solar environment in California

East Bay Green Home Tour

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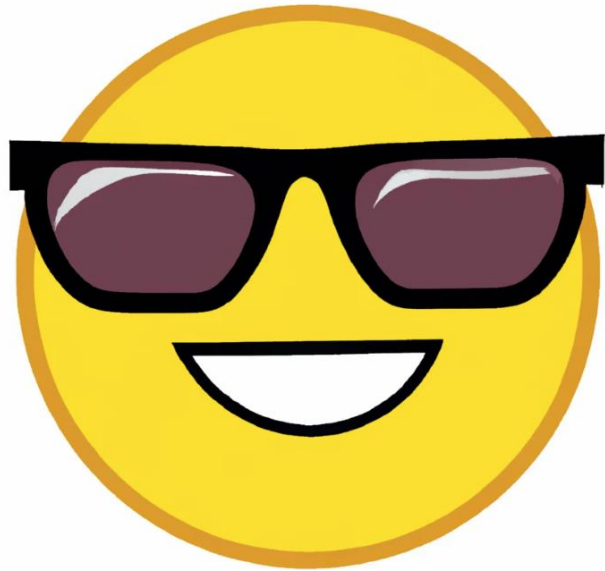
Please put questions in Q&A



Does rooftop solar still make sense?

Two answers...

For California, **YES!**
Absolutely definitely yes

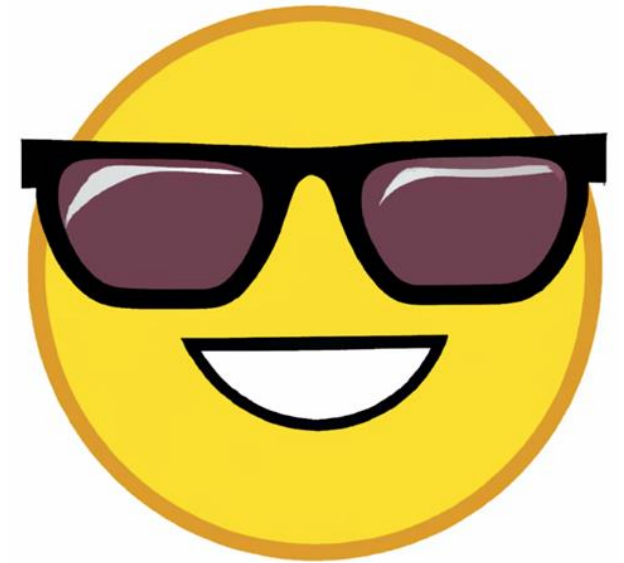


For individuals,
Definitely ... sometimes



For California, **YES!** Makes sense! Rooftop solar:

- Could generate over 80% of our total electrical demand
- Is cheaper, cleaner, more efficient, more reliable than distant power
- Starts no wildfires, creates many more local jobs than distant power
- With batteries, solar enables microgrids for outage-free power and grid health
- Requires no environmental tradeoffs (unlike desert solar)

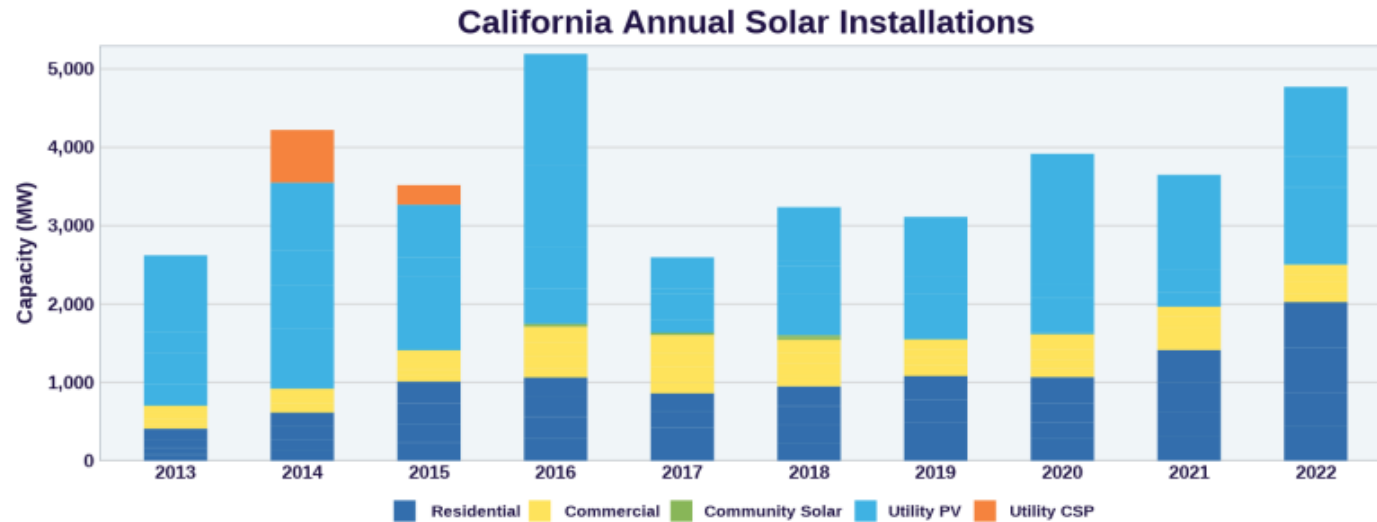


Maximal rooftop solar should be our clean bright shiny future but

The future ain't what it used to be (Yogi Berra)

Home solar now *sometimes* makes sense

- NEM3 began on 4/15/2023
- Reduces payment for solar energy by ~75%
- Payback time is *much* longer and *much* more uncertain
- Most solar advocates expect NEM3 to decimate the industry



<https://www.seia.org/sites/default/files/2023-03/California.pdf>



2024

Why did we undermine our rooftop solar leadership?
Long story - not the focus here

We have high energy bills and a lot of sun

So ... when can rooftop solar still make dollars and sense?

Solar DOLLARS (short summary of a big topic)

- **Simple payback** (in years) =
Total system cost divided by your annual electric bill savings
- **Levelized Cost of Energy (LCOE)** (in ¢/kWh) =
Total system cost divided by lifetime expected kWh generation
- Check electric bill (not gas) for total cost and total kWh used during the last 12 months. Divide to find your average ¢/kWh
Bay area avg: 33.2¢/kWh
- For Simple Payback & LCOE, consider how much PG&E rates will rise - over 25 years!
Faster increase means better solar investment
- **Power Purchase Agreement (PPA)** or **Lease** for solar and batteries
Choose your terms: \$0 down, fully pre-paid, partial pre-paid
- More to explore
Own vs PPA or Lease; Batteries; *Time of Use (TOU)* rate plans and NEM3 *Avoided Cost Calculator*; PG&E bill *True-ups*; Expand existing system without triggering NEM3; Upgrade electrical service for new loads; Hybrid inverters, *Distributed Energy Resources (DER)*, *Virtual Power Plants (VPP)*...



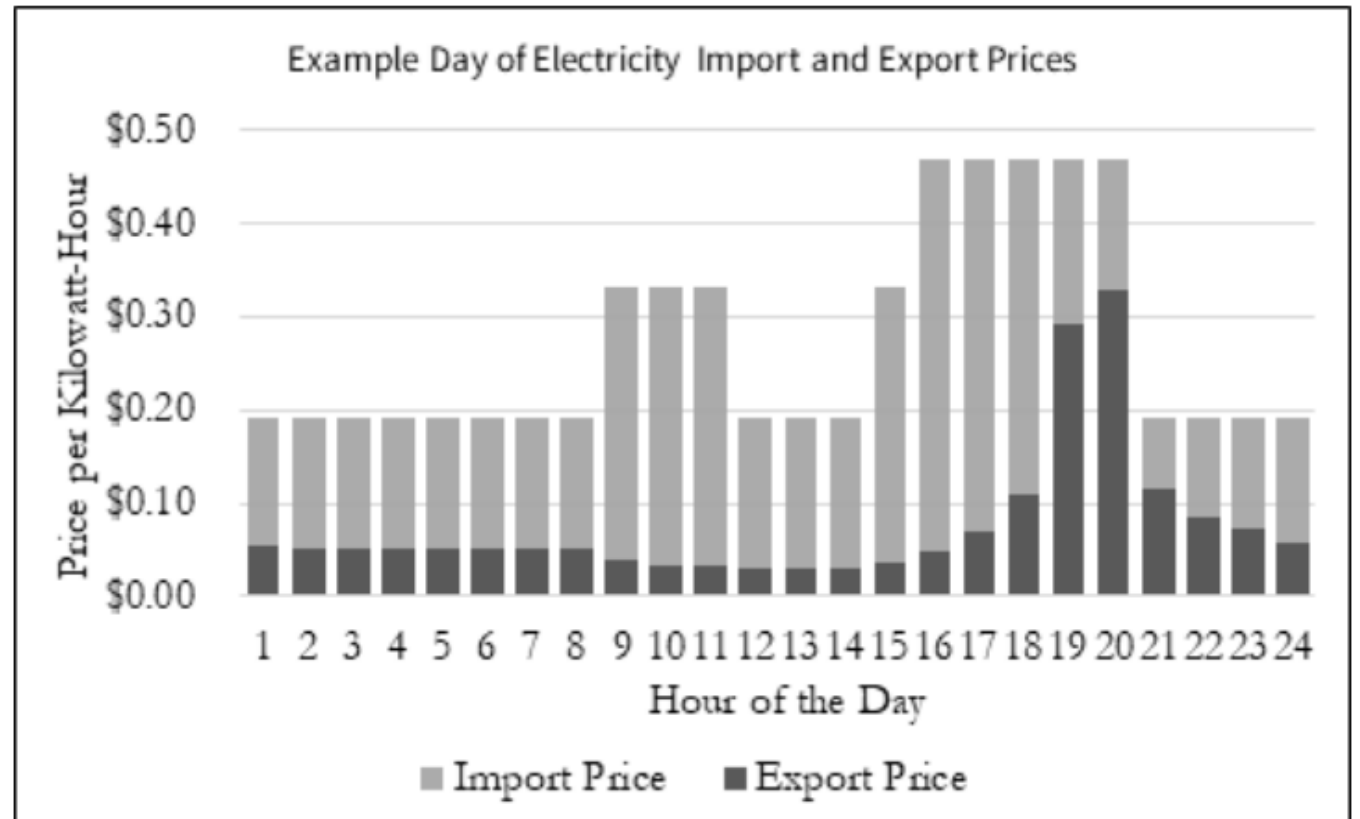
→ Ask questions to Zoom Q&A now, or anytime to Doug@LightsOnSolar.com

At first glance home solar doesn't make sense

- Grid energy is very expensive when we use it most and the sun isn't shining
- When the sun *is* shining, grid energy costs much less
- PG&E pays ***much less*** for your solar than they charge you for comparable grid energy



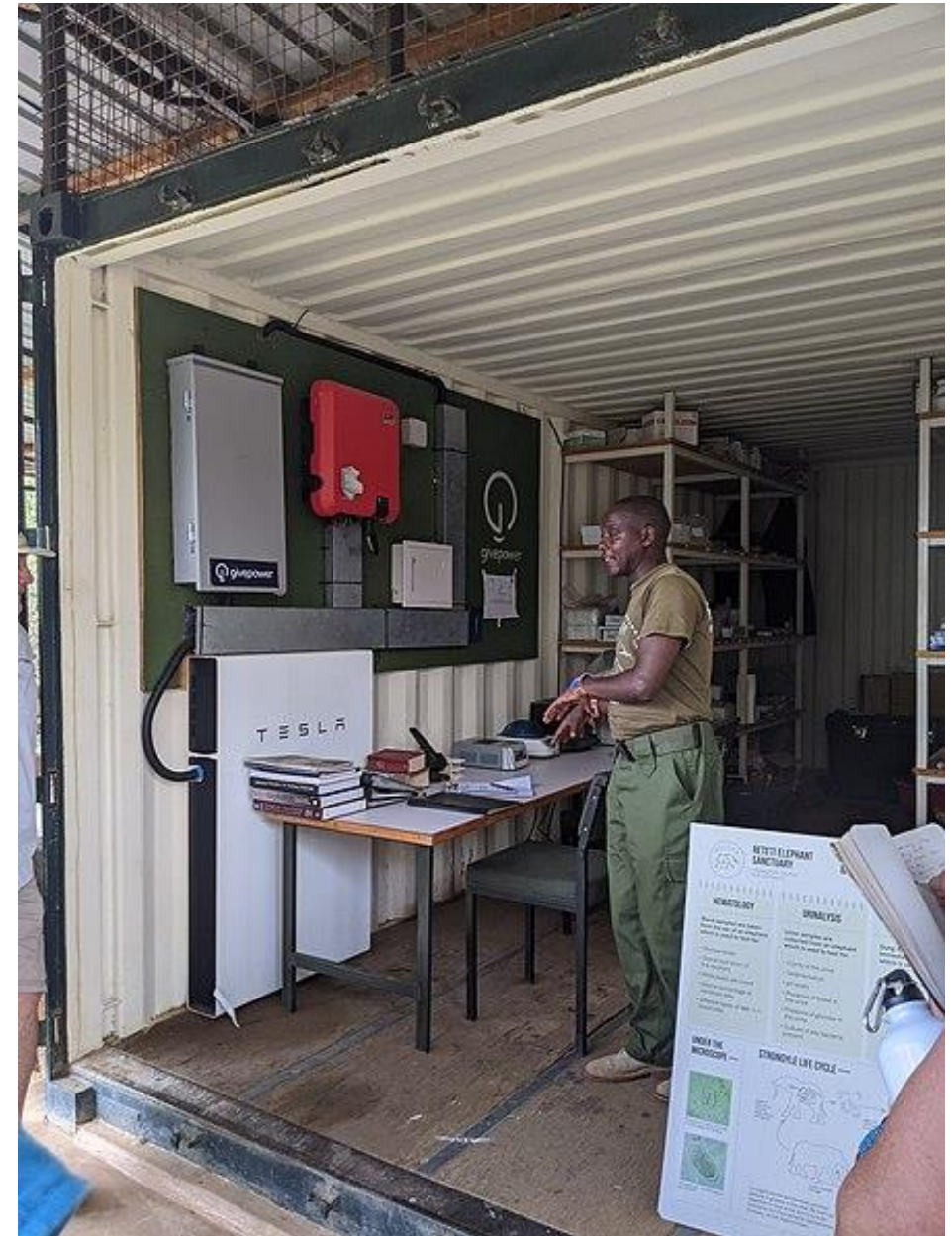
Example
Grid energy price
vs
Solar export price



But there are some **great** options ...

Option #1 - Batteries

- Store solar energy for use when the grid is most expensive
and/or
- Backup power during grid outages
- Complexity
 - Maximum battery power and energy needed?
 - Backup full house, or critical loads only?
 - Backup for how many days?
 - Programming (storm coming? etc)
 - Additional equipment needed?
- Cost
 - \$10,000+ for one Tesla Powerwall. Can be much more (electrical service upgrade, etc)
 - Eligible for 30% federal tax credit
 - May be eligible for CA "SGIP" rebate (larger if low income or in a fire zone)
 - *Virtual Power Plants* - PG&E pilot: may pay extra for battery energy when grid is stressed

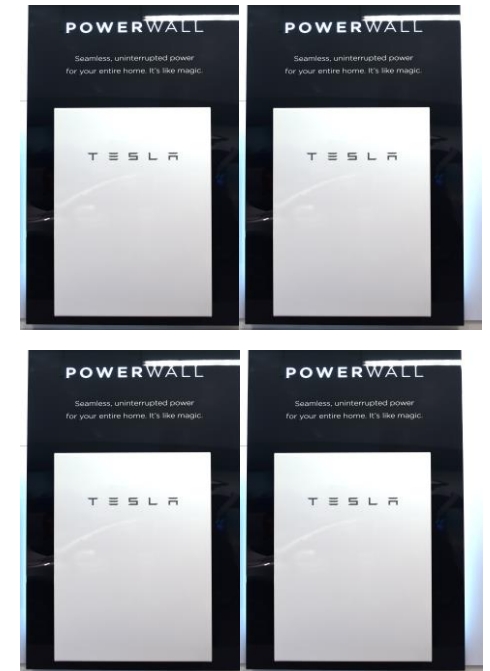


EVs have BIG batteries

- GM Bolt has greater capacity than 4 Tesla Powerwalls for similar cost
- Can't drive your Powerwall to a public charging station during outages
- EVs as *sources* of electricity
 - Only a few models now – Ford F-150 Lightning, Nissan Leaf, Hyundai Ioniq 5, Kia EV6, Mitsubishi Outlander
 - Choices are expanding rapidly
 - More to Explore: Vehicle to home (V2H), to load (V2L), to grid (V2G) Vehicle Grid Integration (VGI), Bi-directional EV charging, Hybrid inverter, ...
 - CA SB 233 (in committee): Mandates bi-directional charging
- EV incentives are significant but complex. For help:
 - <https://ev.pge.com/incentives>
 - <https://plugstar.com/tools/incentives>
 - <https://www.electricforall.org/rebates-incentives/>
 - <https://driveclean.ca.gov/search-incentives>



https://commons.wikimedia.org/wiki/File:2017_Chevrolet_Bolt_EV_Premier_rear_6.20.18.jpg

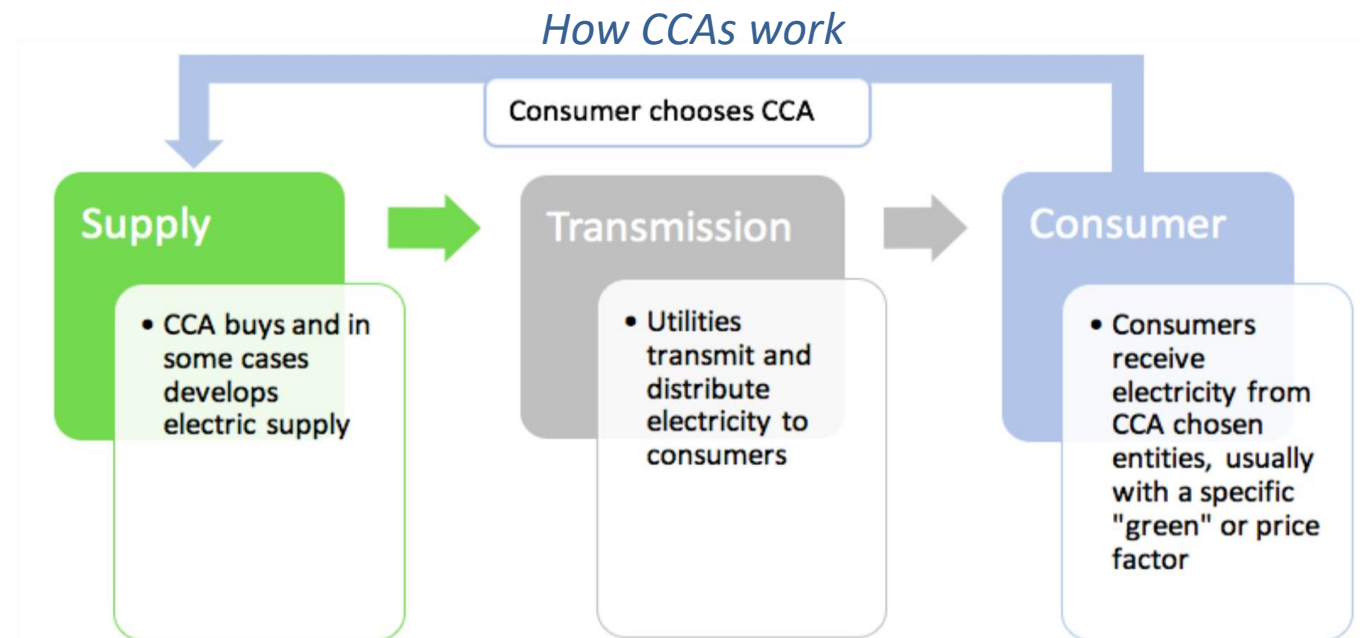


<https://commons.wikimedia.org/wiki/File:TeslaPowerwall2-2.jpg>

#2 - Community Choice Aggregation (CCA)

Your *LOCAL POWER* company

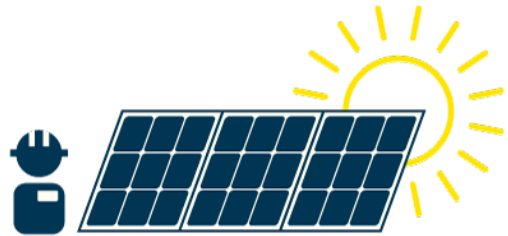
- Most Bay Area residents buy electricity from a CCA program CCAs *generate* electricity, PG&E *delivers* electricity
Single bill from PG&E
- *East Bay Community Energy* EBCE.org services most of the East Bay
- Most CCAs offer 100% clean energy for a small additional charge
- PG&E pays minimal for solar
Your CCA *can* choose to pay more
- Each CCA decides how much to support rooftop solar
- EBCE partners with SunRun for battery backup during outages (Not “SunRun Shift”)



#3 - Community Solar

- Could be called **roofless** home solar
- For renters, too-small or shady roofs, where NEM3 rooftop solar economics don't make sense, etc
- Solar array is offsite, value goes to subscribers

How
community
solar works



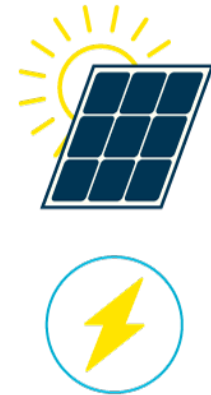
1

Independent solar developers build and operate community solar projects.



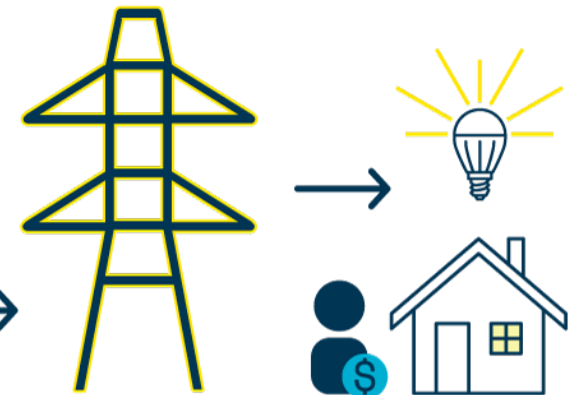
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You can subscribe to energy from a project through a solar developer or their partner.



3

Solar energy from the project goes to the utility grid.



4

Energy flows from the utility grid to your home. You'll receive credits for the electricity generated and pay the subscription fee on your PGE bill.

Community Solar (cont)

- California has struggled with community solar
- AB 2316 looks like a game changer
 - Signed into law in 2022
 - Pairs community solar with storage
 - Gives renters access to solar
 - Subscribers must be 51%+ low income
 - Requires large utilities to participate
 - Adoption deadlines: early to mid 2024
- Some CCAs (incl EBCE & MCE) offer limited Community Solar
- *People Power Solar Coop*
 - Local power ↔ Energy democracy
- PG&E's Community solar
 - *Solar Choice* - solar from a pool of PG&E projects: On hold, waitlisted
 - *Regional Renewable Choice* - choose a local project: No projects now available



#4 - Free Solar *(no, not those ads)*

Meet location and eligibility req's and non-profit Grid will install solar on your home at no cost. Not a lease, you own it

- Low to moderate incomes in specific areas
- Call 866-921-4696 or go online: <https://gridalternatives.org>

You can also volunteer on Grid installs to learn about solar



Lower Cost Solar & Batteries

SunShares offers discounted solar or storage from selected vendors

- Annual program
- Go to BayAreaSunShares.org to learn or sign up

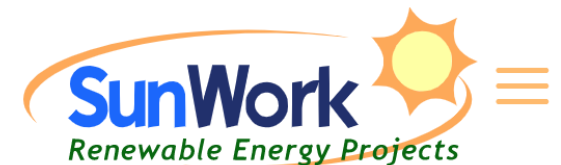


Affordable Small Solar

Meet eligibility requirements and non-profit SunWork will install solar or heat pump water heaters at reduced cost

- Call 650-520-9918 or email info@sunwork.org or go to SunWork.org

You can volunteer on installations (optionally your own) with SunWork



Other options

- Off-grid solar tied to EV or stationary batteries
- Portable solar - usually paired with a battery
- Inverter from EV accessory battery to run fridge, electric burner, medical equipment, etc during outages
- EV main battery charges accessory battery
 - SJ Mercury 4/17/23: *How your car can power your home*

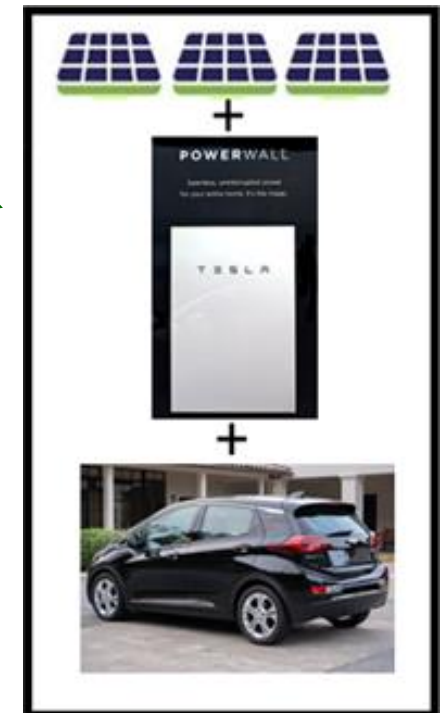
Don't mess with electricity unless you know what you're doing!!

- Batteries from PG&E
 - *Portable battery program* for medical needs
 - *Backup power transfer meter* to auto-transfer loads to portable battery during outages
 - Batteries can be charged with portable solar
- Expand existing solar without triggering shift to NEM3
- Push your CCA to support home solar maximally
- Solar is *always* a great environmental investment



The Future

- Home solar will get better forever
 - Gas appliances will get more expensive to own and will be gradually banned
 - Electric appliances (& EVs) will get less expensive to own
 - The more home solar we have, the less desert solar with wildfire-causing transmission lines we'll need
- Microgrids -----
 - Solar + batteries + neighbors = *local power*
 - Goal is grid *integration*, not grid *defection*
 - Also *Virtual Power Plants* (VPP)
- Fight back
 - Reverse the NEM3 decision: Lawsuit against CPUC filed May 4
 - Beware AB 205: income-based energy bill, *ignores* home solar & conservation
- Energy industry disruption is just beginning
 - Learn about it, help guide it
 - Good places to start: Load shifting vs backup, kW vs kWh
CCA vision & history, Solar non-profits, East Bay Green Home Tour!



Thanks!



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