Multi-Property Microgrids and “Own Use”

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Background: Oakland EcoBlock

A Zero Net Energy, Low Water Use Retrofit Neighborhood Demonstration Project

Funded by California Energy Commission, EPIC Program
Accelerating the Deployment of Advanced Energy Communities

Developing a multi-property microgrid with shared PV and battery storage for one urban block (~30 units) with older homes in a low-to-moderate income area

- Built on deep efficiency retrofits, electrification of natural gas end uses
- Provide infrastructure for shared EVs
- Aim to make resilience, PV + storage and EVs affordable for lower income communities
- Plan: Islandable microgrid on PG&E-owned and operated distribution infrastructure
  Reference case: Redwood Coast Airport Microgrid

Tasked with studying different possible designs & configurations

Note: The comments in this presentation are offered in the spirit of contributing to the general discussion on "Own Use" to advance climate goals, equity, and resilience, based on our team's December 2020 White Paper.

https://ecoblock.berkeley.edu

Things we probably all agree on

Safety:
- don’t endanger linemen
- don’t start fires or electrocute people

Climate:
- encourage more PV to replace fossil generation
- replace gasoline cars with EVs
- retire natural gas and electrify end uses

Resilience:
- keep the lights on when possible
- encourage energy storage for grid reliability and stress relief

Equity:
- consumer protection – don’t let people get taken advantage of
- don’t shift any costs to ratepayers who don’t benefit
- allow access to modern technology for all income levels

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Flexible microgrids as a solution:

- *increase hosting capacity for DER*
- *leverage DER as good citizens on the grid through aggregation and intelligent control*
- *potentially lower cost to society by addressing multiple challenges simultaneously*

Idea: Multiple homes share resources for own use

We believe PUC Section 218 already allows this.

For example:

- Homeowners' Association owns and operates shared assets (PV + battery)
- Design, sizing & location of assets based on technical merit
- HOA interfaces with utility, responsible for O&M
- No energy sales take place; members share ownership
- Non-profit, community-based
- Rules to ensure safety, define eligibility, spell out governance process

PUC Section 218

PUC Section 218 (a) excludes from electric corporation electricity *"generated on or distributed by the producer through private property solely for its own use or the use of its tenants and not for sale or transmission to others."*

- "Own use" doctrine makes explicit that individuals can generate and store their own power. Clearly, a landlord can do the same for tenants.
- If I own adjacent properties and rent out the houses, Section 218 would not prevent me from sharing generation assets (although Commission Rules 18/19 would).
- Why should the property line matter?
  What features of a landlord-tenant relationship warrant exception from the Commission's jurisdictional reach that is different from an HOA-type arrangement?
- Nothing in Section 218 prohibits individuals from collectively pooling their resources to generate and store electricity, as long as there are no sales.
- Rules for over-the-fence *sales* (limiting to two properties) don't apply if there are no sales.

Why is “Own Use” appropriate?

- There is a natural optimal size for block-scale DER aggregation, with a distinct economy of scale for 5-30 homes and diminishing returns thereafter.[1]
- Rules can be specified for maximum size or other characteristics to ensure public policy objectives are met.
- Criteria may include physical fit with existing distribution system infrastructure for islanding, which would limit aggregation to small feeder sections.
- This allows for co-ownership and collaboration among neighbors, so those of lower income and with smaller homes can access the benefits of scale.
- Suitable rules of engagement and tariffs should *prevent* grid defection.
- Today’s technology allows for seamless coordination of DER in a way that was not foreseen decades ago, when Section 218 was written.

1 A. Ostfeld, M. Whitmeyer and A. von Meier, "Adaptive Islanding and Self-Sufficiency of Block-Scale Microgrids," *2018 IEEE Green Technologies Conference (GreenTech),* Austin, TX, 2018, pp. 44-48. doi: 10.1109/GreenTech.2018.00017

Possible obstacles to reliance on the “Own Use” doctrine

Rules prohibiting one premise supplying electricity to another?
See PG&E Electric Rule 18, SCE Electric Rule 18, and SDG&E Electric Rule 19 (collectively “Rules 18/19”).
Note that these rules are Commission-based and could be revised to facilitate microgrids in the public interest.

Safety Considerations?
This legitimate concern can be addressed with proper inspections and licensing.

Ratepayer impacts?
Creation of resilient microgrids should not leave remaining customers with system costs.
Note that the Block-scale microgrid model does not contemplate load departing, but rather remaining connected and providing grid services while advancing policy goals.

We think multi-property, own-use microgrids can serve all of these goals!

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Questions?