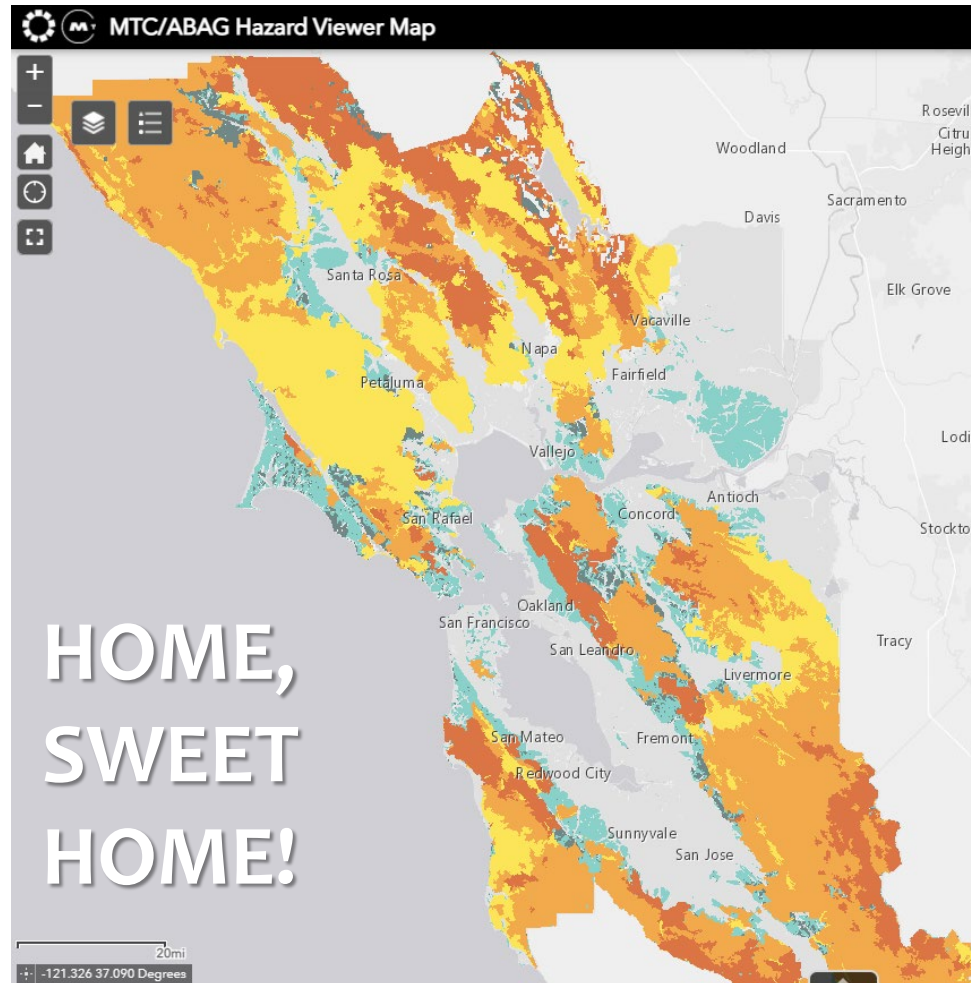


Resilient Home Synergies (& otherwise)

Efficiency, Electrification, and Wildfire Protection



Legend

Fire Hazard Severity Zones

- Moderate
- High
- Very High

Landslide Hazard (Rainfall Induced)

- Flat land
- Few landslides
- Most landslides

Resilient Home Synergies (& otherwise)

Efficiency, Electrification, and Wildfire Protection



Efficiency Synergies

- Electrification
- New Construction



ALL retrofit opportunities also apply to new construction

For Starters: Wildfires = PSPSs!*



So resiliency for wildfires (**ideally**) goes with resiliency for PSPSs

* Public safety power shutoffs

Efficiency Synergies: Enclosure



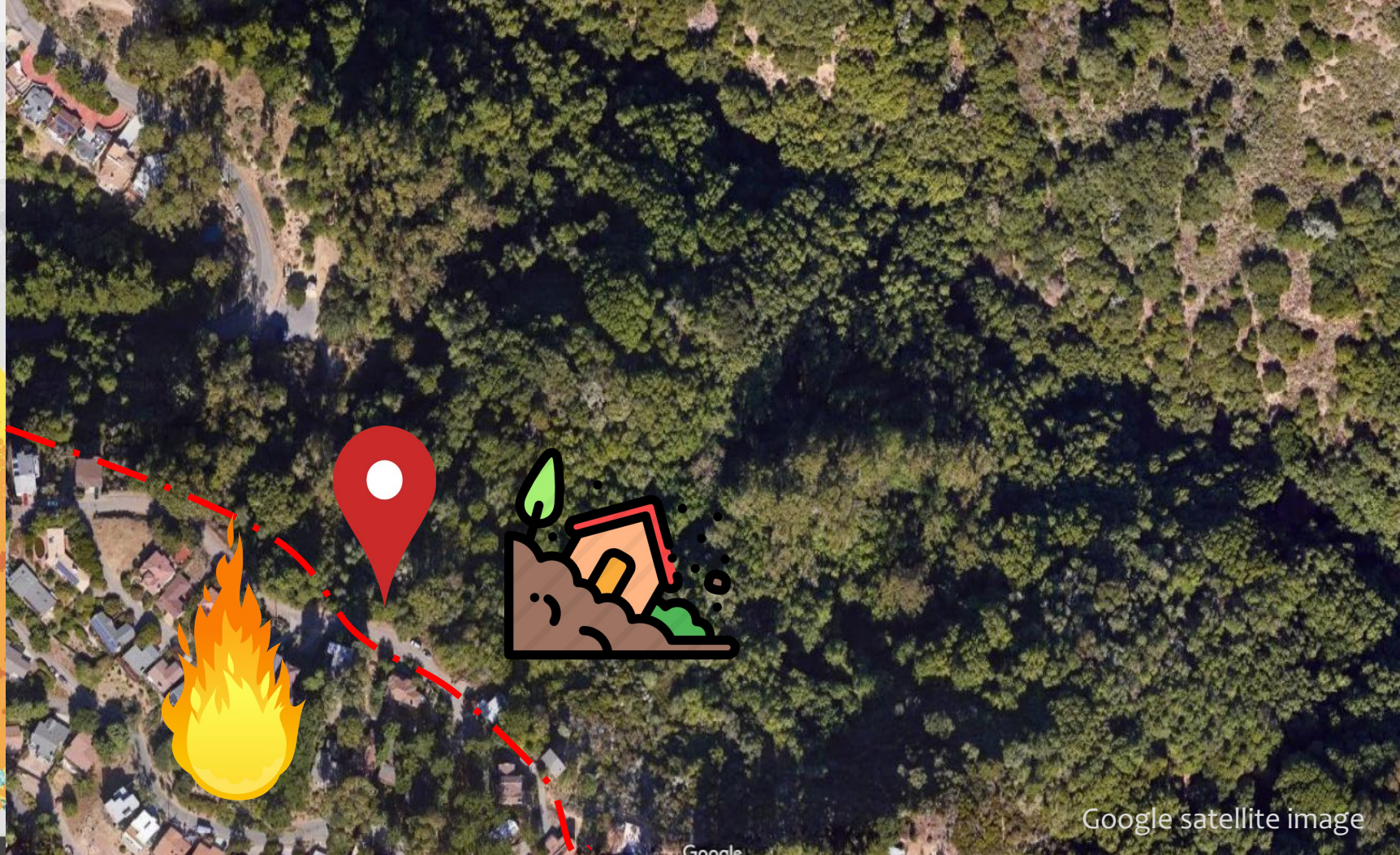
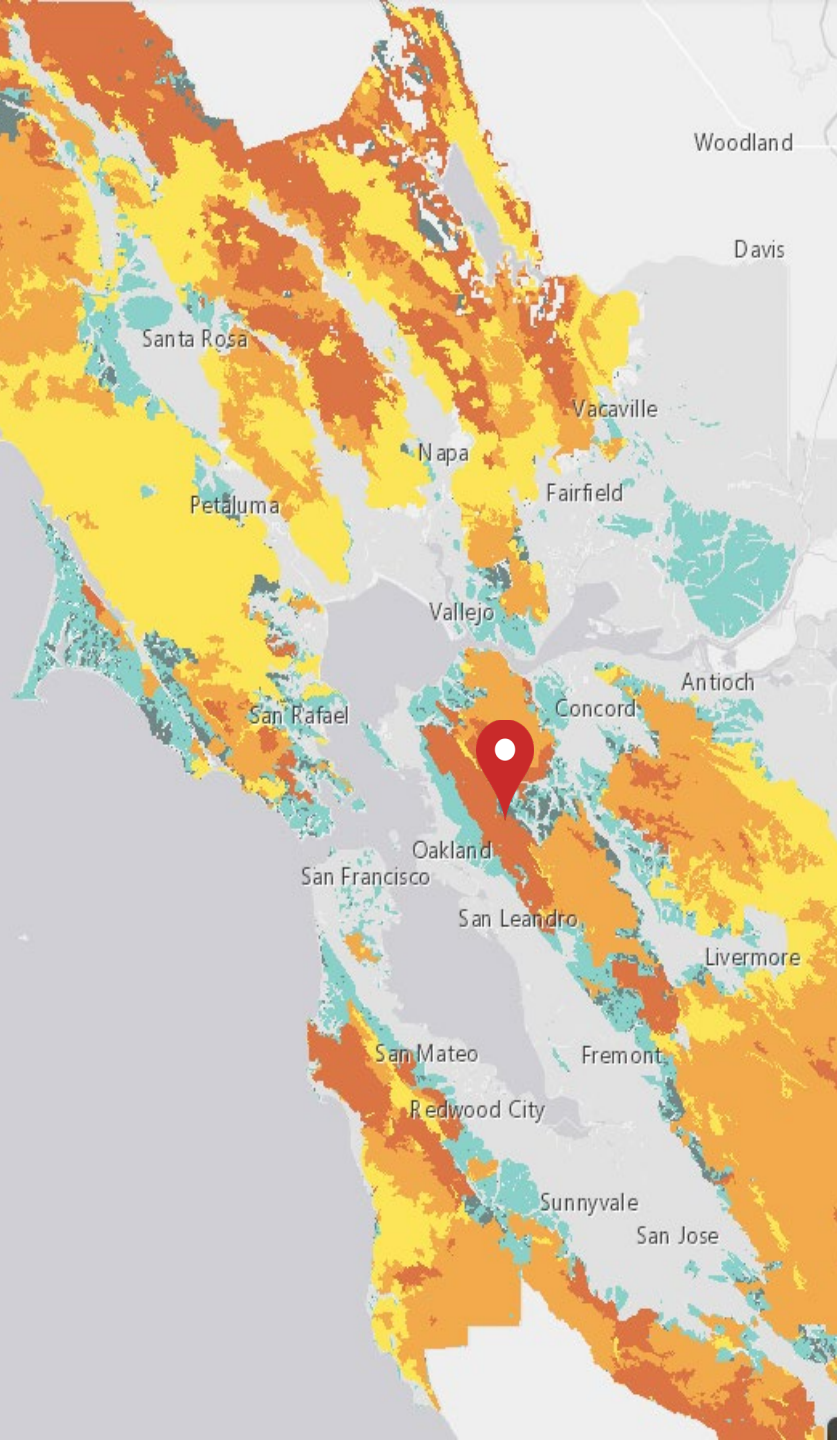
Health
benefits!

An **EFFICIENT ENCLOSURE** means:

- Stable indoor temperatures when the power is out!
- Indoor air stays indoors, outdoor air stays outdoors

Oakland Case Study

Prime Real Estate?!



Efficiency Synergies: Enclosure



VINTAGE: mid-1970s

Retrofit opportunities

- Remove deteriorated siding, then—
- Air seal
- Install new cavity insulation
- Add non-combustible continuous exterior insulation
- Install new, non-combustible siding

Dual
benefit

Efficiency
benefit

Dual
benefit

Fire
safety

Efficiency Synergies: Enclosure



Retrofit opportunities

- Replace large expanses of single glazing with new windows—

Dual benefit

- Dual-glazed

- Tempered (both panes)

- Metal-clad (no vinyl!)

Fire safety

- Compression closing

Fire safety

Dual benefit

Efficiency Synergies: Venting



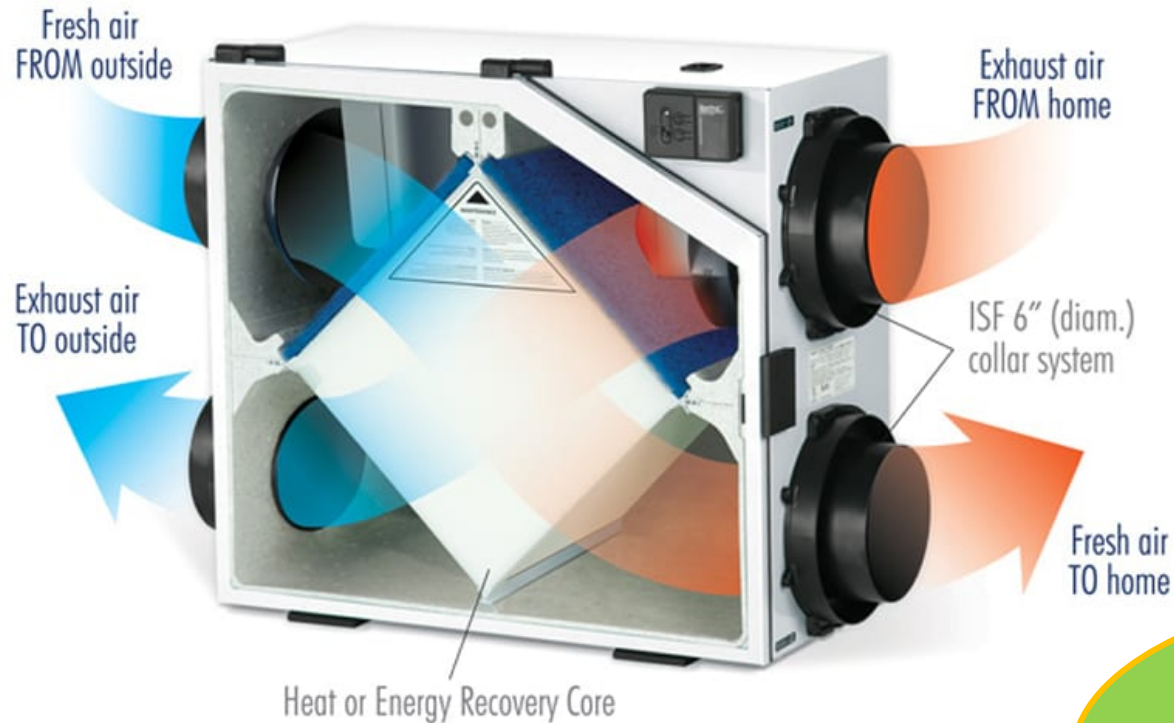
Retrofit opportunities

- Eliminate roof and crawl space vents—
- Insulate at roof plane instead of ceiling
- Insulate crawl space walls instead of under floor
- Install new mini-splits & ducting in newly insulated attic & crawl space

Dual
benefit

Efficiency
benefits

Efficiency Synergies: Ventilation

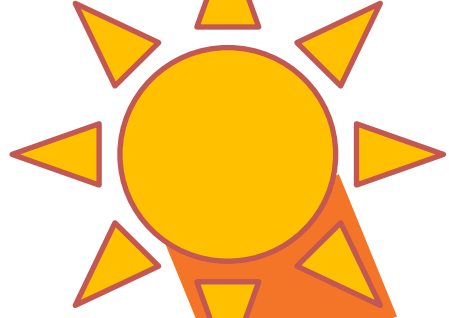


Retrofit opportunity

- Install heat- or energy-recovery ventilation system(s) in newly insulated attic and/or crawl space

Health benefit ...
especially during
wildfire season!

Efficiency
benefit



Efficiency Synergies: Skylights



Retrofit opportunity

- If you are due for a roof replacement and/or adding solar—
- Consider eliminating/reducing skylights!



NEW
CONSTRUCTION?
JUST SAY **NO!**

Resilient Home Synergies (& otherwise)

Efficiency, Electrification, and Wildfire Protection

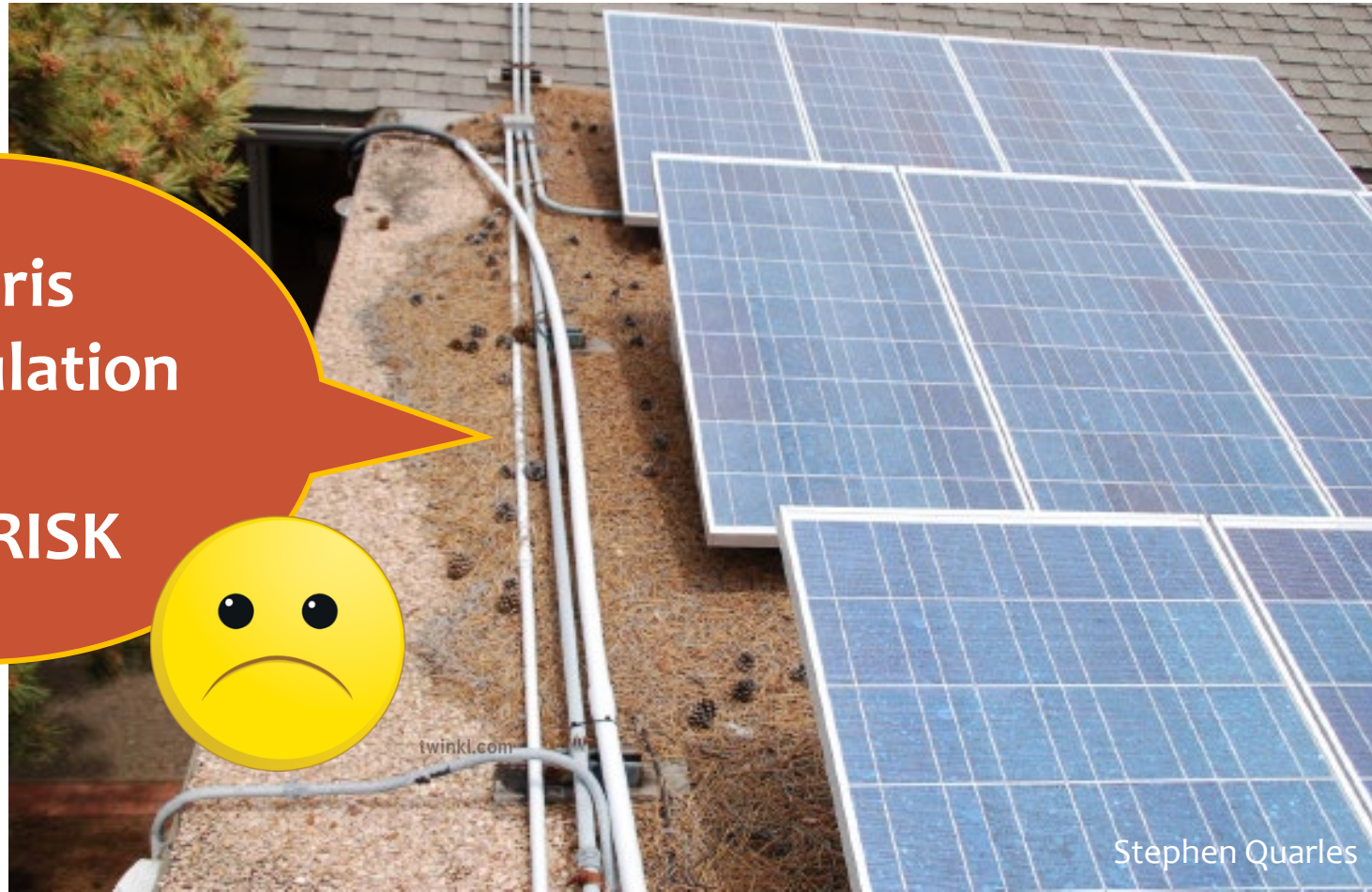
- Efficiency Synergies

-  **Electrification**

- New Construction

Electrification ~~Synergies~~: Photovoltaics

Debris
accumulation
=
FIRE RISK



Stephen Quarles

Electrification Synergies: Battery Storage



IF you have a battery when the power goes out in an all-electric house

- The lights stay on
- The fridge stays cold
- You can keep working (or studying)
- You can cook on your stove

BUT ...

Electrification ~~Synergies~~: NO Battery Storage



IF you *don't* have a battery when the power goes out in an all-electric house

- The lights don't work
- Food in your fridge goes bad
- You'll have a hard time working (or studying)
- You *can* cook on your **CAMP STOVE** or **BARBEQUE**



Resilient Home Synergies (& otherwise)

Efficiency, Electrification, and Wildfire Protection

- Efficiency Synergies
- Electrification

 **New Construction**

New Construction ~~Synergies~~: Complex Forms



Many places for
**FLAMMABLE
DEBRIS TO
COLLECT!**

REALLY HARD to heat,
insulate, & air seal
COMPLEX forms!
LITTLE space for PVs!



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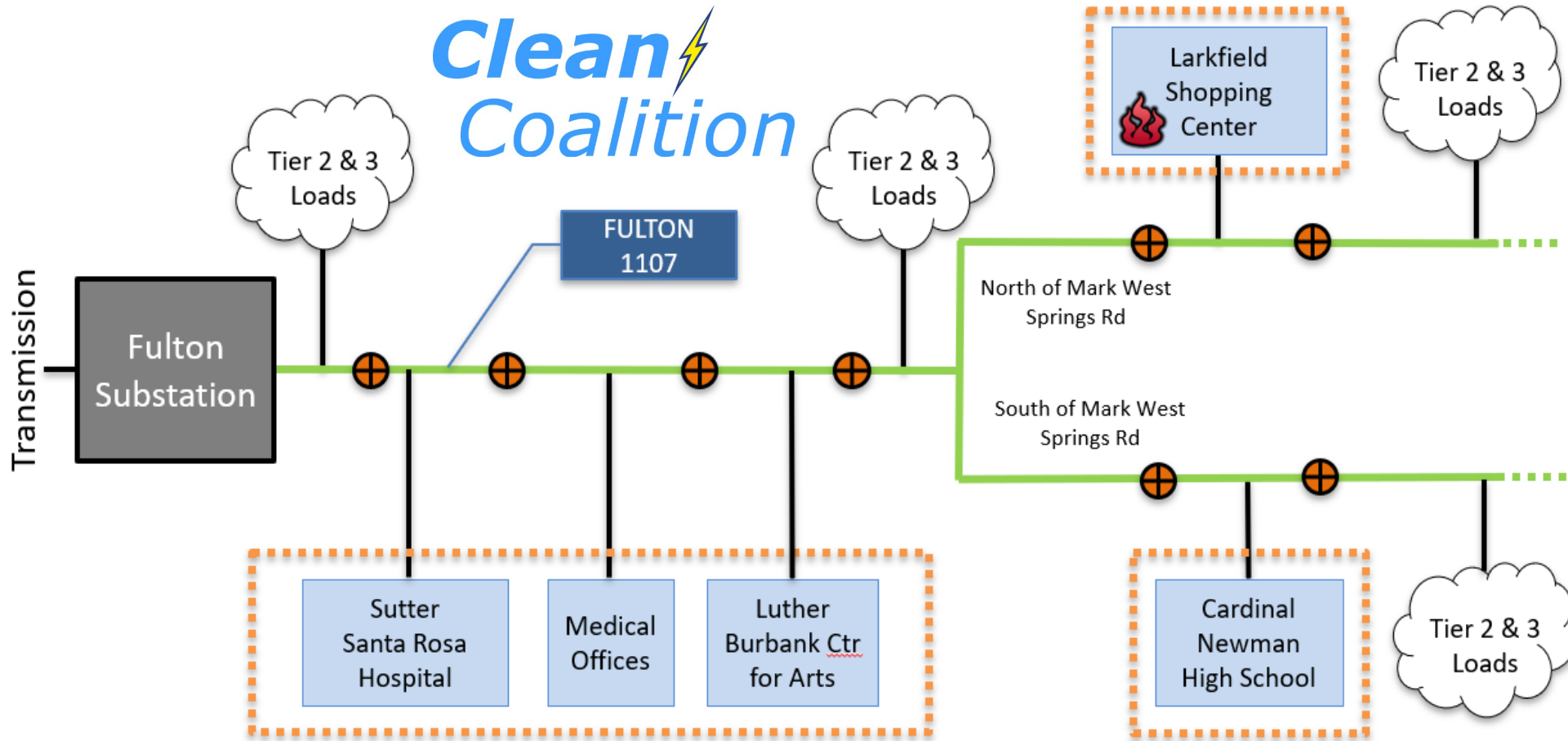
New Construction Synergies: Simpler Forms

MUCH EASIER to heat,
insulate, & air seal
SIMPLE forms.
PVs fit easily.

FAR FEWER
PLACES for
debris to collect



Pulling It All Together: Microgrids



Homes & communities—

- Local clean energy supply & storage
- Islandable in emergencies
- Energy always available at critical sites
- Load/grid controls

LEGEND

- ⊠ Autonomously controllable microgrid
- ⊗ ⊕ Relay/switch (open, closed)

*Thank
you!*



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- Zero carbon consulting
- Design team facilitation
- Writing, research, advocacy