ASSOCIATION FOR ENERGY AFFORDABILITY INC.

Electrifying Multifamily Buildings

Opportunities and Lessons Learned from the Field

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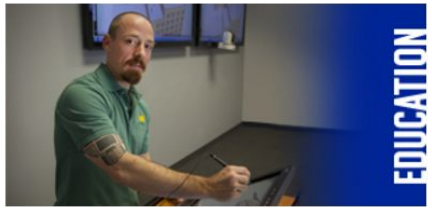
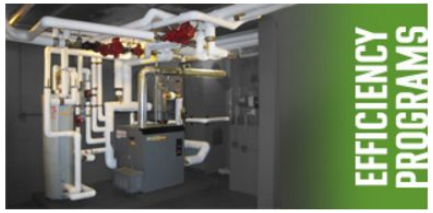
ASSOCIATION FOR ENERGY AFFORDABILITY INC.

Energy Efficiency is our Specialty, Affordable Housing is our Priority

The Association for Energy Affordability, Inc. is dedicated to achieving energy efficiency and decarbonization in new and existing buildings in order to foster and maintain affordable and healthy housing and communities, especially those of low-income. With locations in CA and NY, AEA representatives engage in a broad range of educational, technical and construction management activities and services to promote this mission and develop the industry that advances and sustains it.

- Energy efficiency program design and implementation
- Energy research & demonstration projects
- Energy audits and green building design for new construction and existing buildings
- Electrification: Currently provide numerous California multifamily electrification programs, as well as direct consulting to buildings on electrification best practices





MF Electrification Program Types

- Low-Income MF Whole Building
- General MF Whole Building
- Low-Income MF Individual Measures
- General MF Individual Measures
- Direct Install
- Midstream
- New Construction

Space Heating Electrification Measures

- **A/C Already Existing?** Could be same form factor
  - Split DX Heat Pump
  - Packaged DX Heat Pump
  - Packaged Terminal Heat Pump

- **No Existing A/C?** Less benefit from traditional types, can consider new equipment types
  - Mini-Split Heat Pump
  - High Performance Unitary Heat Pumps

Water Heating Electrification Measures

Heat Pump Water Heaters

- In-unit Residential
- Central Multifamily
- Dedicated Laundry
- Pool

Other Measure Opportunities

- Electric Cooking
- Electric Laundry Drying
- Electrical Capacity
- Complimentary Programs
  - Solar PV
  - Electric Vehicle Charging
  - Battery Storage
  - Load Shifting/Demand Response

Electrification + Energy Efficiency

- **Reduce loads** to make equipment smaller, easier, and cheaper
- **High performance envelope and ventilation** systems
  - Smaller heat pumps for space heating
- **Efficient plumbing** fixtures and distribution systems
  - Smaller & simpler heat pump water heaters
- **Smaller renewable energy systems** to offset overall energy use

Key Electrification Program Features

- Streamlined and Simple (as possible)
- Single Point of Contact
- Flexible and Adaptable
- Strong Customer Support and Technical Assistance

Driving Participation

Persuasion and Education! Technical assistance for the property owner and contractors

- Pair electrification measures with existing or new Solar PV
- Cleaner air, safety
- Bill savings
- Equity
- 2-for-1 when replacing A/C
- Removal of gas meters (one utility to manage)
- Buildings are always going to have electricity
- Early adopters
- Take advantage of higher rebates
- Future regulation(s)

Image: Dave Sweet

Driving Bill Savings

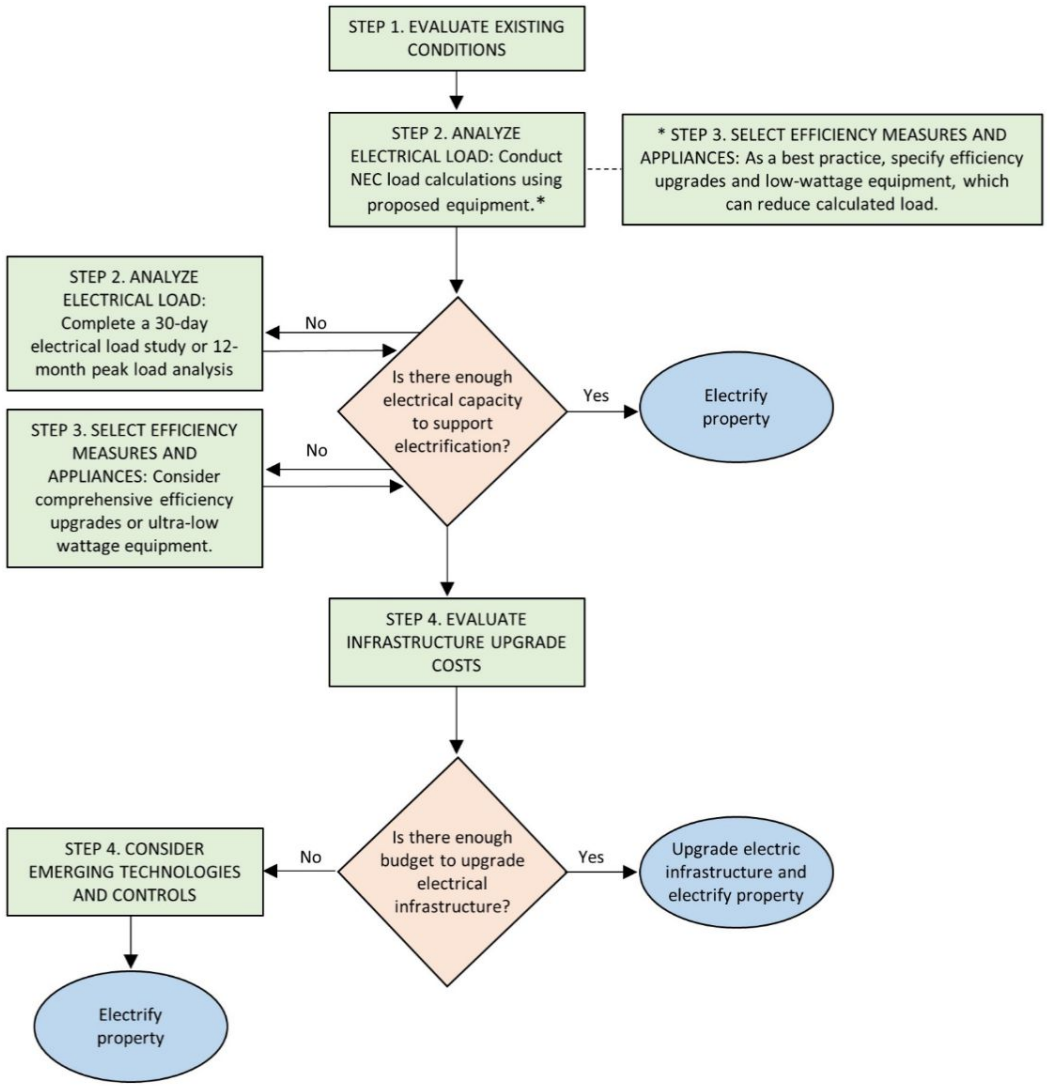
- Cheaper electric and more expensive gas helps (propane or fuel oil definitely helps!)
- PV systems help
- Really inefficient exiting fossil fuel equipment and really efficient electric equipment help
- Complimentary energy efficiency helps
- Other Benefits:
  - Comfort and Quality of Life
  - Indoor and Community Air Quality

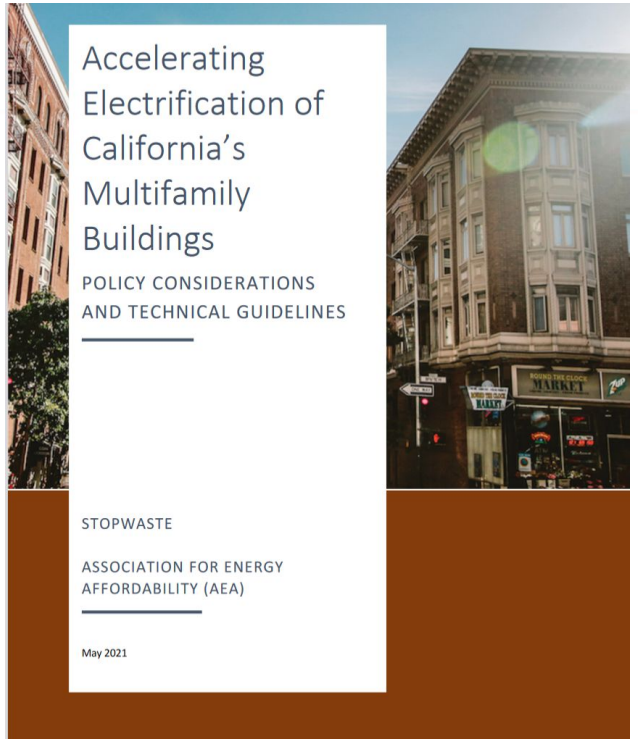
Image: Dave Sweet

Electrification Project Challenges

- Electrical Upgrades - space for new dedicated breakers / capacity)
- Building modifications
- Upfront cost
- Consumer knowledge
- Contractor knowledge
- System sizing
- Range of options (many pros and cons)
- Programmatic quantification/reporting metrics

MF Electrification Feasibility Guide





https://www.stopwaste.org/accelerating-electrification-of-california%E2%80%99s-multifamily-buildings

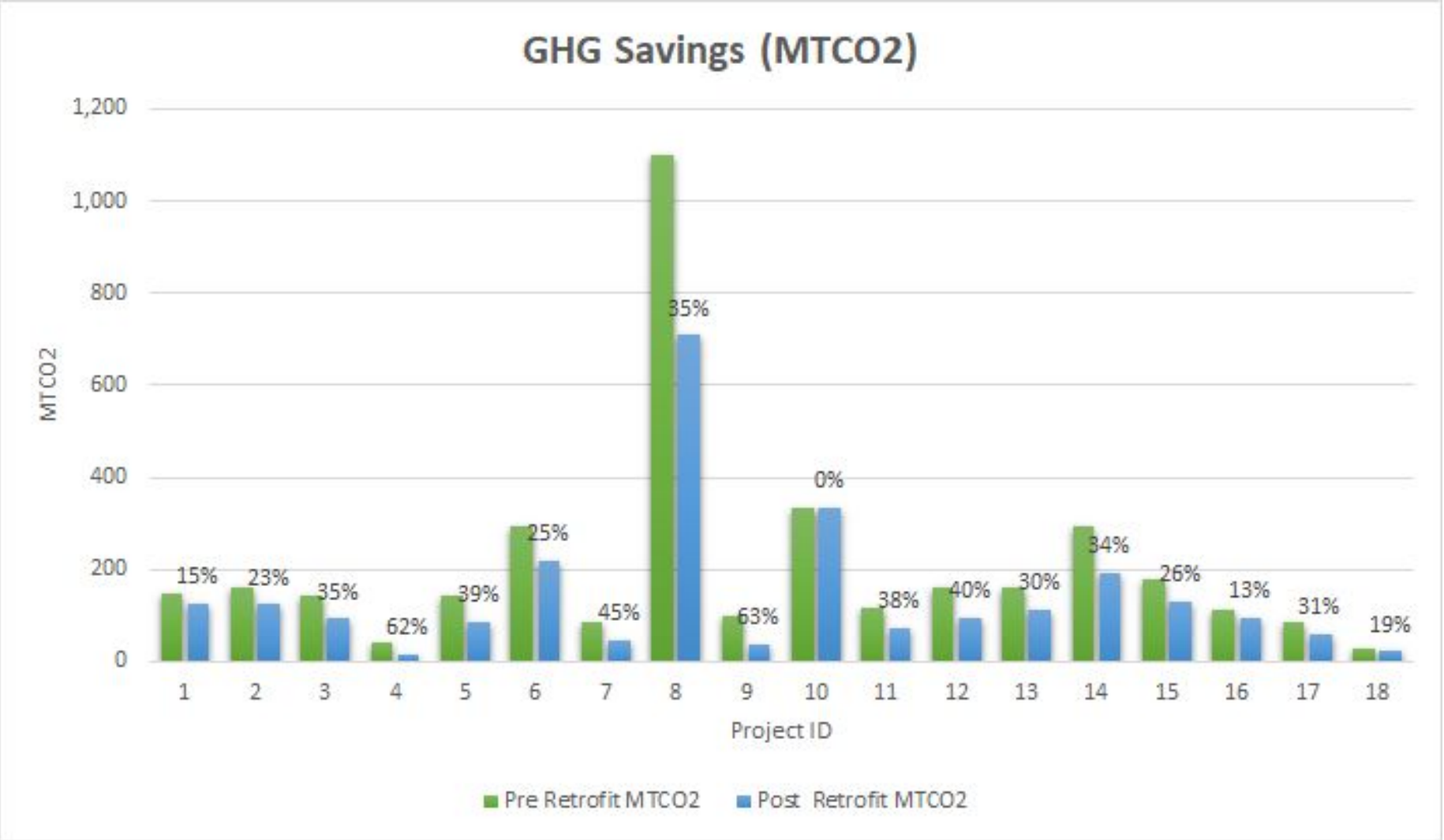
How to scale electrification?

- “Scale” is relative. 5x is easy with more resources, but 100x?
- Midstream and upstream can help
- Downstream support still needed (project-based support and targeted downstream incentives)
- Direct install might work for some measures, but not for all
- Some upgrade opportunities could scale easily, while others will need specialized support

Key collaboration partners

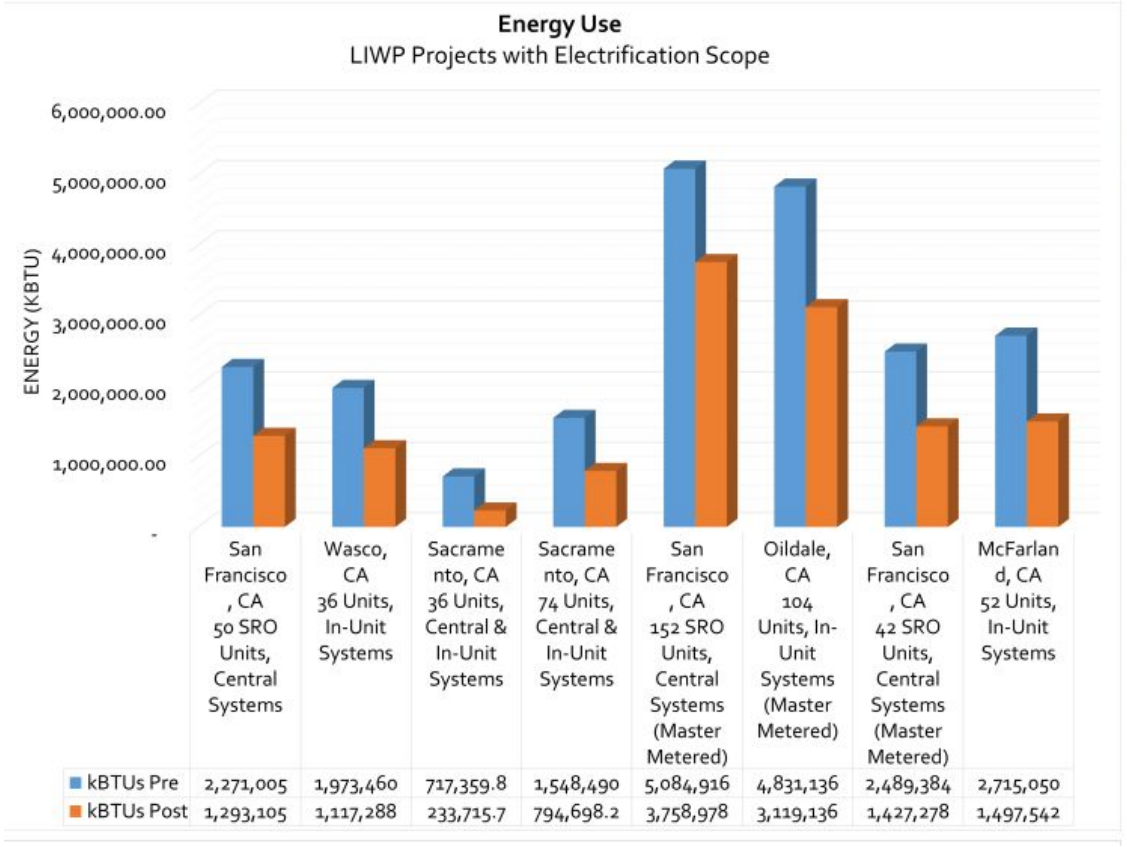
- Local Government!
- Air Pollution/Air Quality Districts
- Community Based Organizations
- Workforce Organizations
- Health Organizations
- Utilities
- Manufacturers

Results – It works!

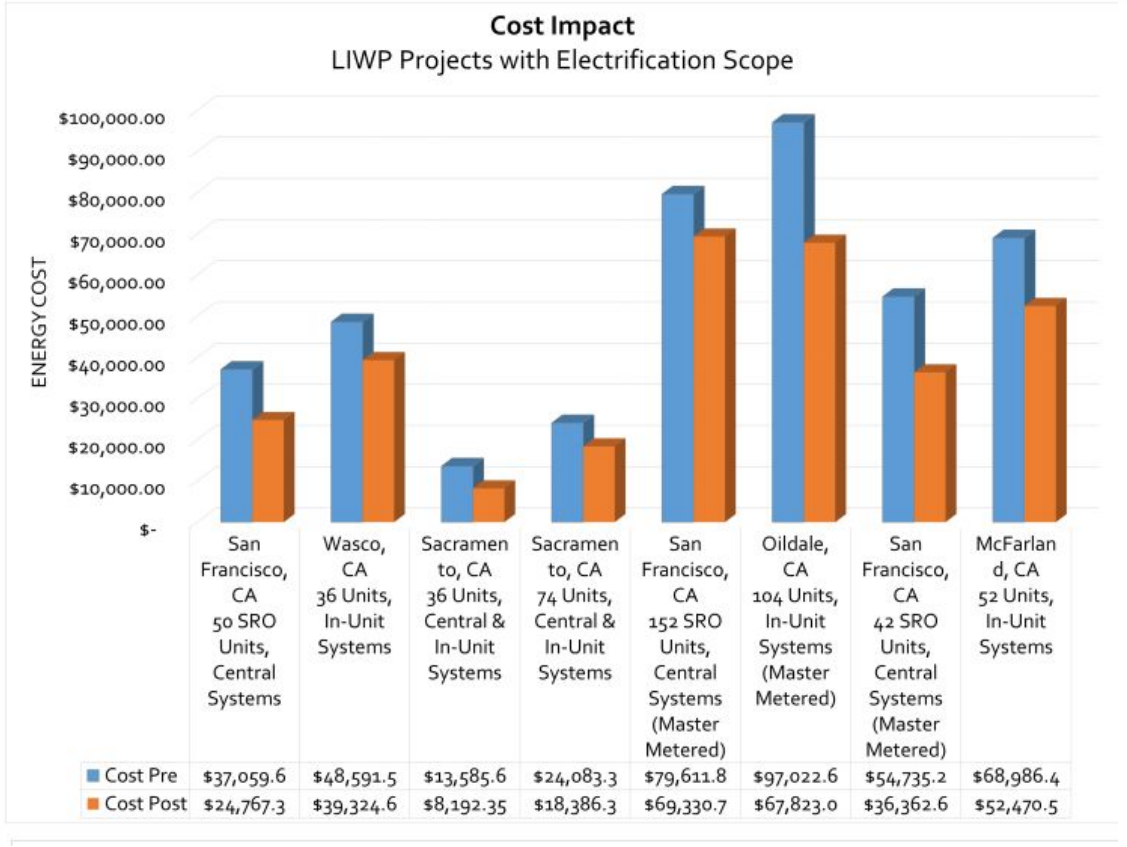


Results – It works!

Reduce Energy Usage



Stabilize (and offset) Costs



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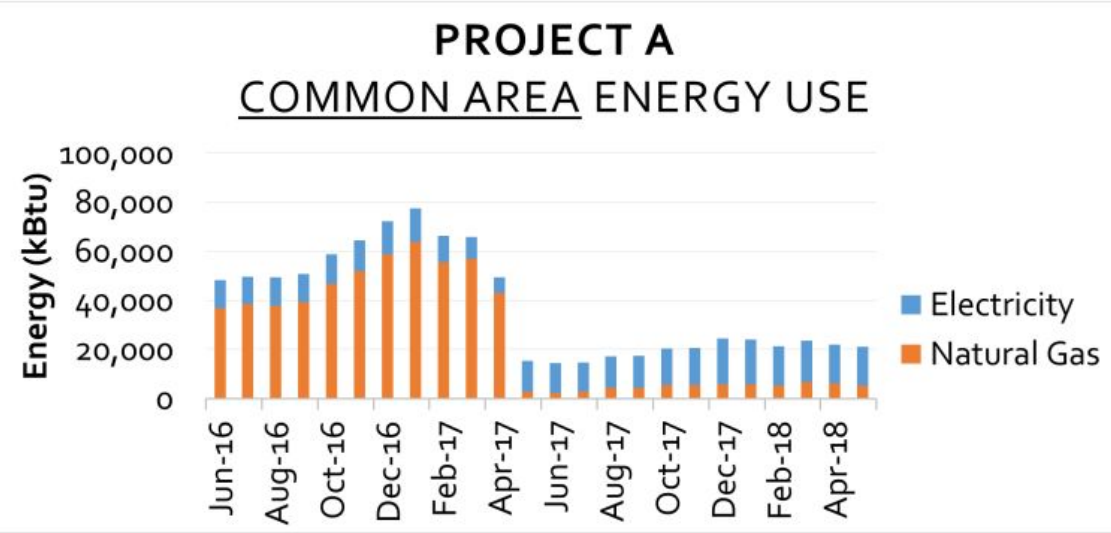

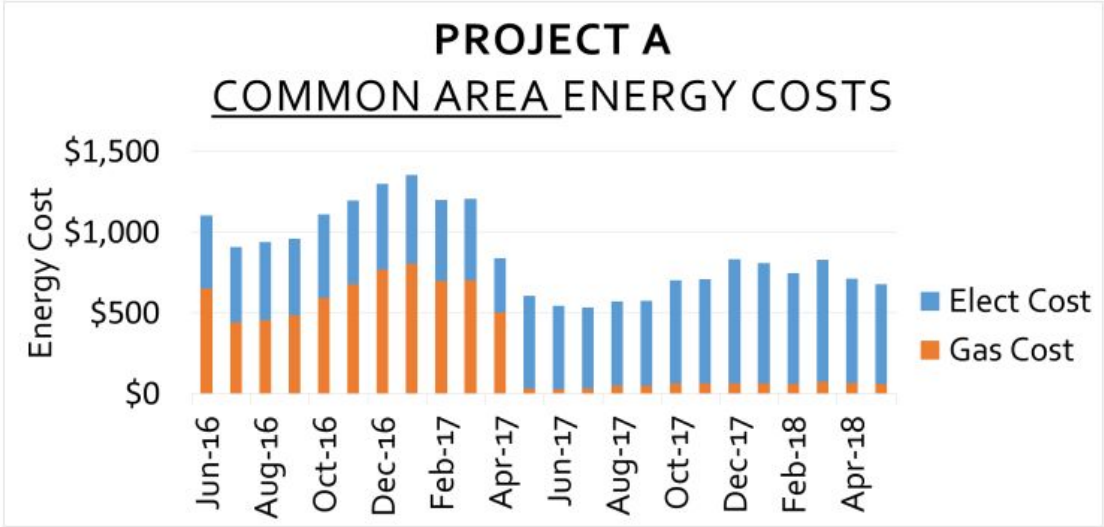

Property Information

- Located in Sacramento, CA; built in 1960
- 36 units, 36,944 sq. ft.
- Central DHW (switched from gas to heat pumps)
- Unitary HVAC (gas furnace & AC) - energy use not included in graph (graph is common area data only)
- Energy savings of 64% (89% gas, -33% electric)

- Cost savings follow similar curve as energy savings (see left) — property is on small commercial electric rate (SMUD - GNS_T) and had pre-existing solar PV
- Energy savings of 64% (89% gas, -33% electric)
- Cost Savings of 36% (90% gas, -25% electric)

Questions?

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