

Welcome! The Webinar will begin shortly



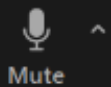
# Sustainability and Climate Action Plan Ad Hoc Committee

October 14, 2021

[cityofpaloalto.org/ClimateAction](https://cityofpaloalto.org/ClimateAction)

*Acting Now for a Resilient Future*

Click on Q&A anytime during the presentation to ask questions



Mute



Chat



Raise Hand



Q&A

Leave

# Agenda

- **Recap of September S/CAP Ad Hoc Meeting**
- **Buildings**
  - Multi-Family Building Electrification
  - Non-Residential Building Electrification
  - Electrification Assessment of City Facilities
- **Building Electrification Permitting**
- **Near-Term Funding and Resources**
- **Public Comment**





- Barriers to Residential Building Electrification identified by participants
  - Cost of conversion (this came up several times and was the number one barrier)
  - Belief that technology will get a lot better in just a few years
  - Unwillingness to toss out a perfectly good appliance
  - Unfamiliarity of what residential electrification conversion means
  - Lack of time to research electrical appliance options
  - The need to upgrade a home's electrical panel
- Additional Feedback
  - More outreach is necessary
  - Group-Buy program for electric appliances is needed



- Participants identified several priorities the City should explore
  - Reduce upfront costs (this came up several times)
  - A strong price signal for carbon
  - Foster neighbor-to-neighbor conversations
  - Ensure that everyone, regardless of income, can electrify their homes
  - Reduce the incentives for non-electric appliances
  - On-bill financing
  - Plan for recycling appliances as they are replaced
  - Pursue multi-family building electrification
  - Invest efforts in programs to reduce vehicular traffic where the climate impact can be much larger
  - Provide back-up power to residents

# Multi-Family Building Electrification

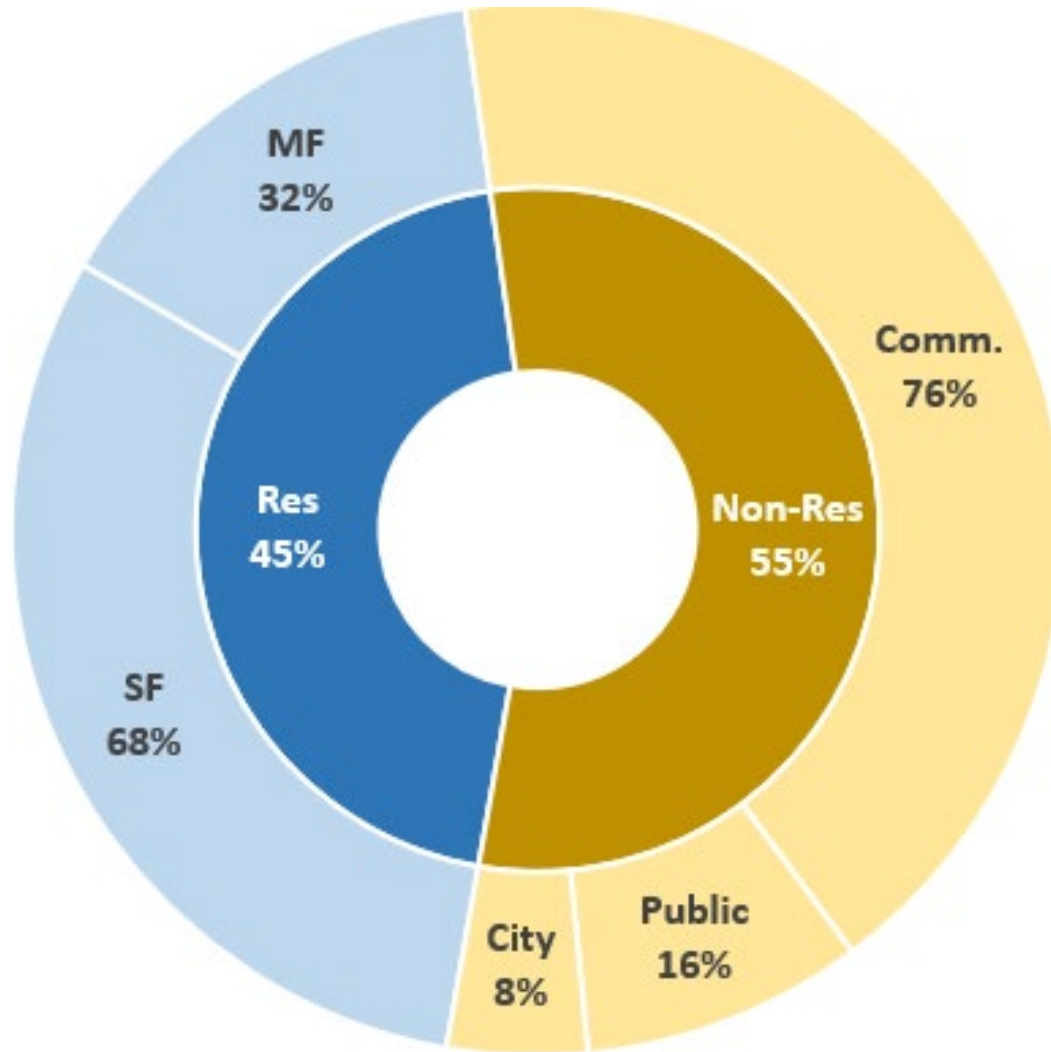
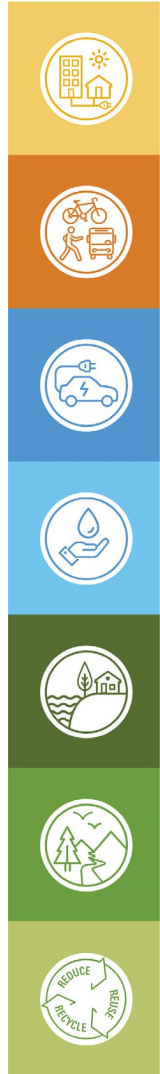


Page Mill Court – site of multi-family gas wall furnace replacement pilot



430 Forest – site of all-electric apartments

# Natural Gas Use by Sector



**11,000 multi-family  
building households  
80% occupied by renters**



- High upfront costs



- Need for electrical upgrades



- Lack of familiarity with planning entitlement & permitting process



- Awareness – tenants and property owners

- Property owners don't directly experience benefits (improved indoor air quality and comfort) – “split incentives”



- Disruptive to tenants

- Interest in uniform equipment across properties for ease of maintenance







- High upfront costs
  - customer incentives



- Need for electrical upgrades
  - technical assistance



- Lack of familiarity with planning entitlement & permitting process
  - guidance throughout the project



- Awareness – tenants and property owners



→ Outreach to multi-family property owners and tenants



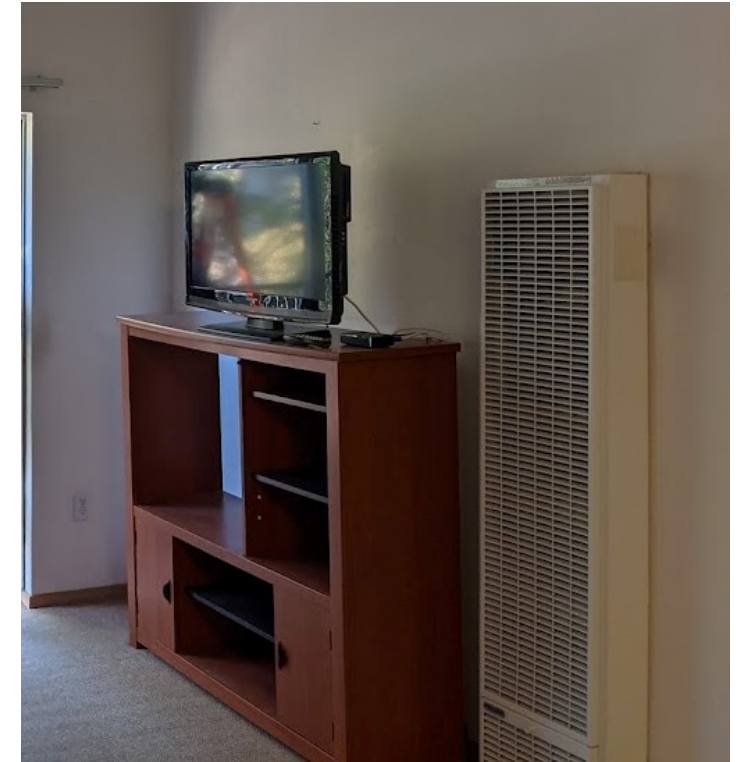


- Property owners don't directly experience benefits (improved indoor air quality and comfort) – “split incentives”
- Disruptive to tenants
- Interest in uniform equipment across properties for ease of maintenance
  - identify when property owners may be most motivated to pursue electrification

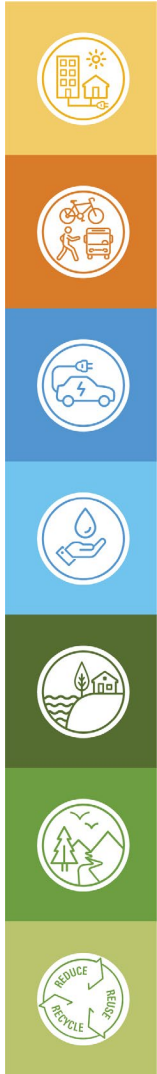




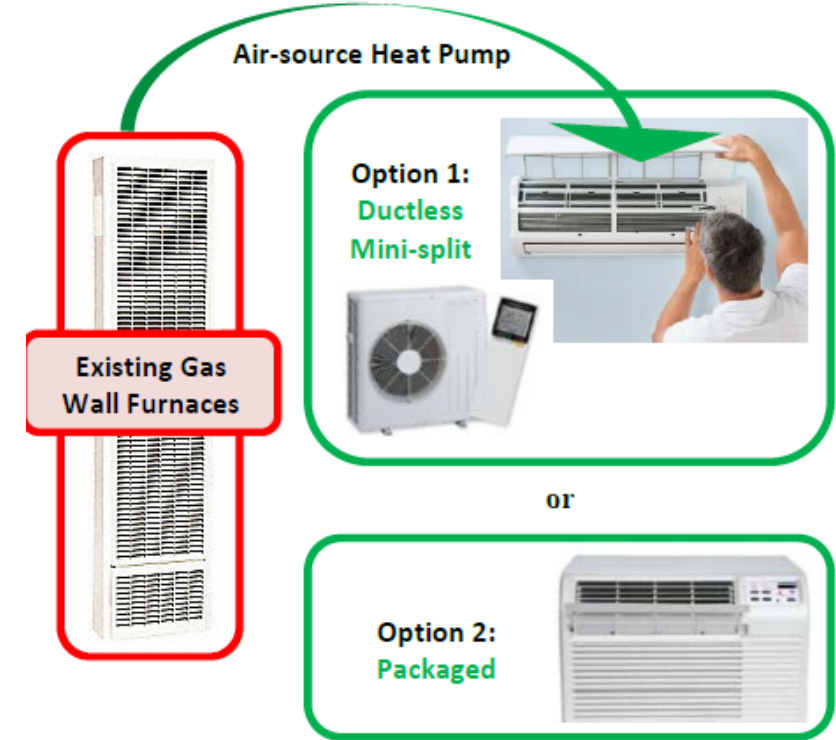
- Engage 3rd party vendor to assess existing multi-family building stock, inventory condition of existing equipment, best opportunities for electrification and efficiency upgrades
- Offer incentives
- Provide technical assistance
- Target projects that offer most benefit – gas wall furnace replacement in low-income housing



# Multi-Family Space Heating Electrification Pilot



- Grant-funded pilot project to replace gas furnaces in a low-income multi-family property with heat pump systems
- Pilot objectives:
  - document cost and challenges (permitting, construction)
  - inform permit streamlining process and development of multi-family electrification program
- Selected pilot site: Page Mill Court (24 apartment units)
- Planned completion date: December 2021

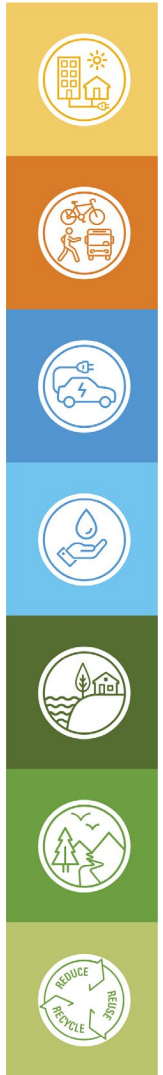




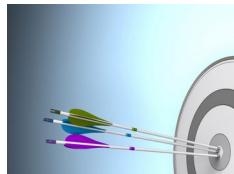
- Leverage information from EVTAP program
- Offer incentives
- Collaborate with Engineering



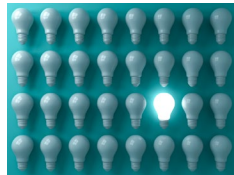
# Planned Programs and Activities 2022 - 2024



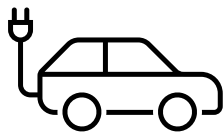
Engage 3<sup>rd</sup> party vendor to assess existing multi-family building stock, identify best opportunities for electrification and efficiency upgrades, provide technical assistance, vetted contractors, and incentives



Target low-income multi-family residences for replacement of aging gas wall furnaces, cover additional cost of replacement and provide technical assistance throughout project

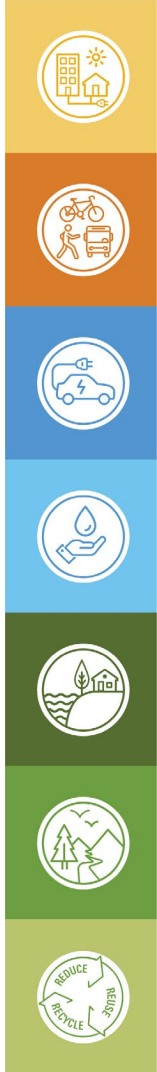


Continue no-cost-to-customer installation services for common area lighting and building envelope improvements



Continue technical assistance and incentives for the installation of EV charging equipment in multi-family properties (up to \$8,000 per port, up to 10 ports)

# Non-Residential Building Electrification



“The world as we have created it is a process of our thinking. It cannot be changed without changing our thinking.”

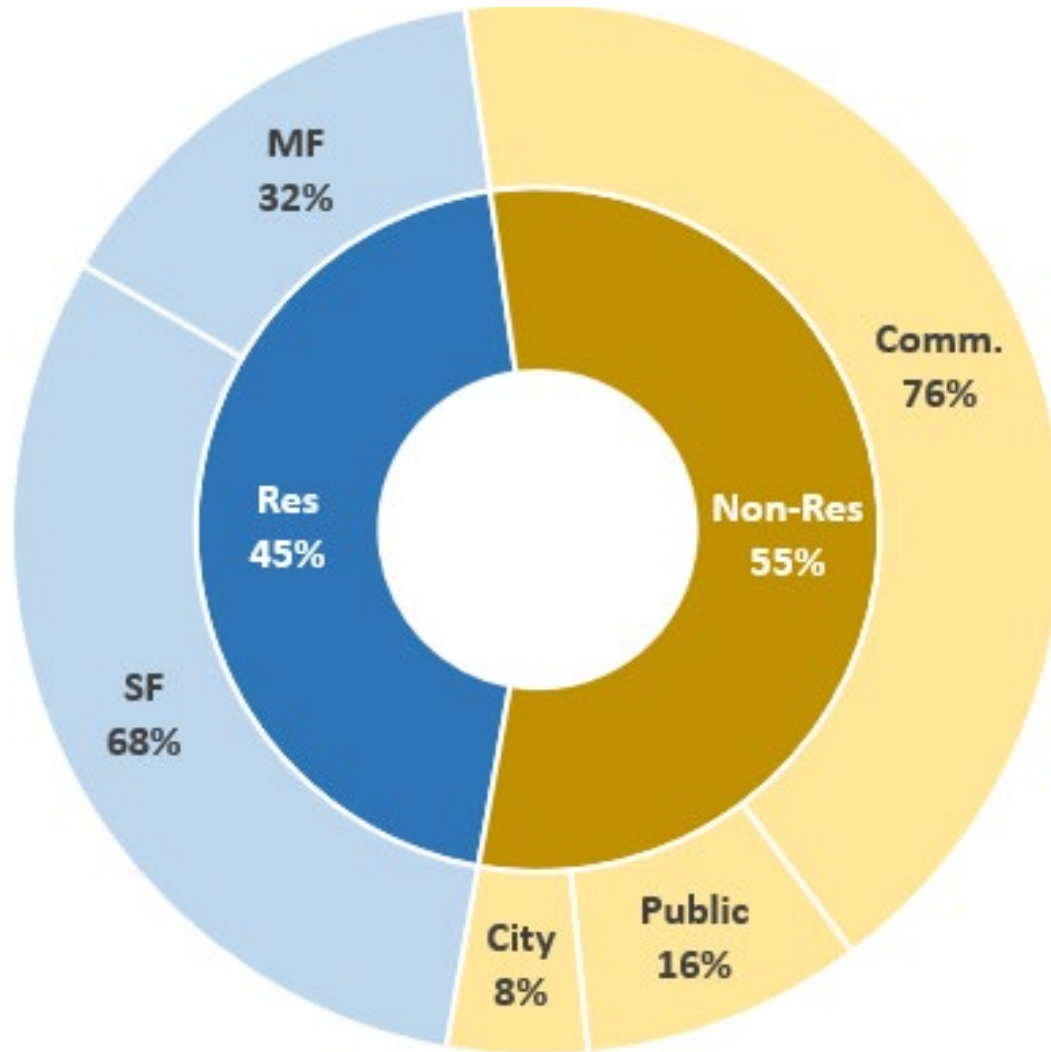
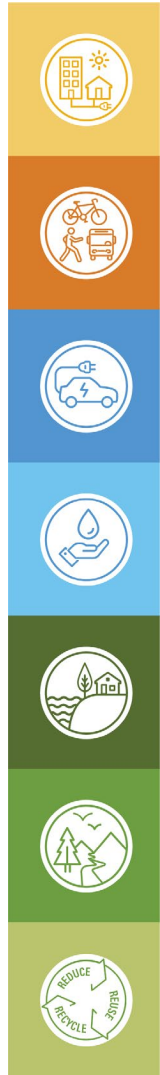
*- Albert Einstein*

# Snapshot of Non-Residential Buildings in Palo Alto





# Natural Gas Use in Non-Residential buildings



## Natural gas end uses in non-residential buildings

- Space heating (38%)
- Water heating (35%)
- Cooking (20%)
- Miscellaneous (7%)



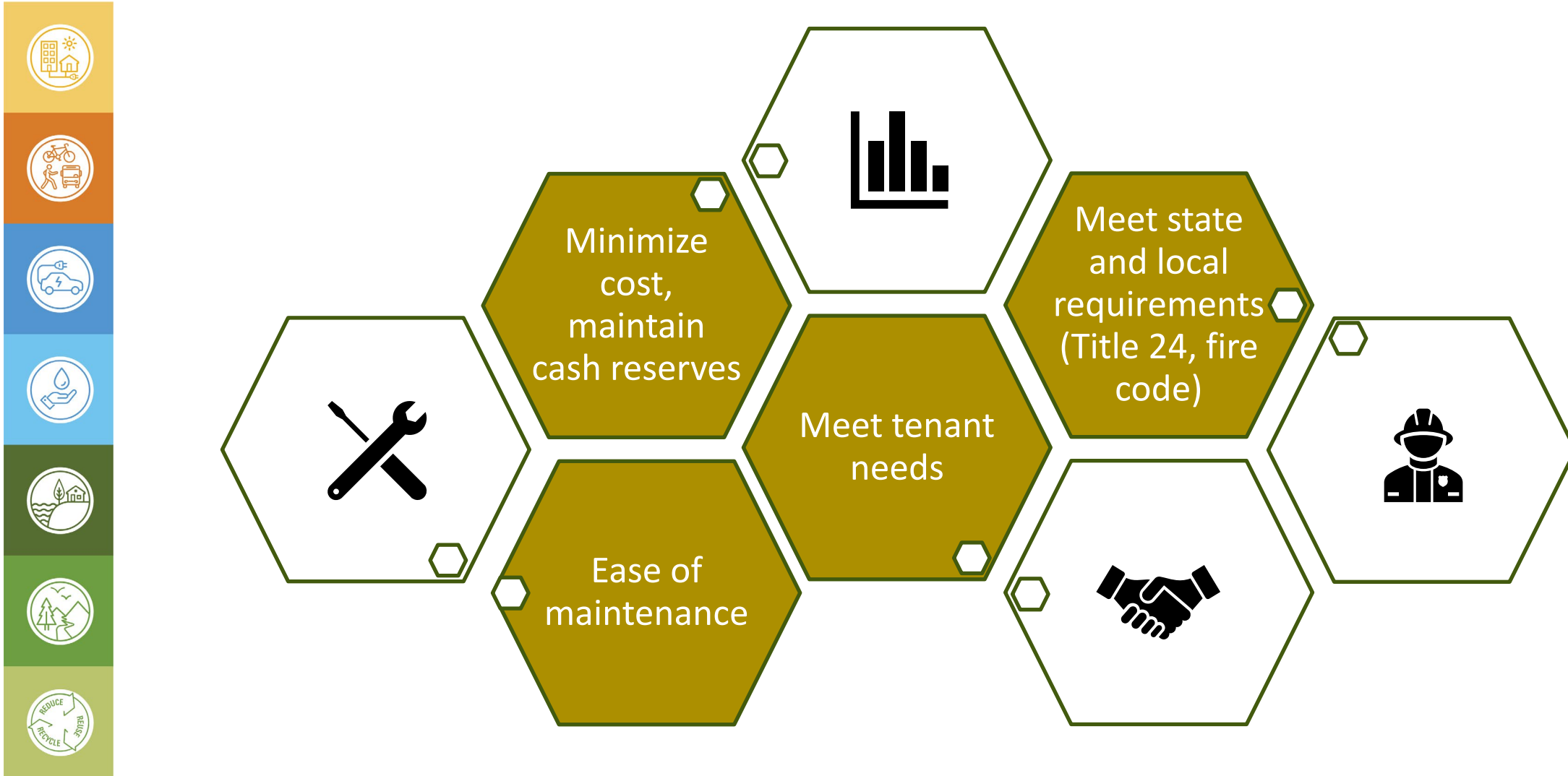
**40% reduction in direct GHG emissions by 2030**

*≈100% electrification of mixed-fuel rooftop packaged HVAC units*

*Minimum 20% GHG emissions reductions in facilities over 25,000 sq.ft.*

*80% reduction in natural gas use in city facilities*

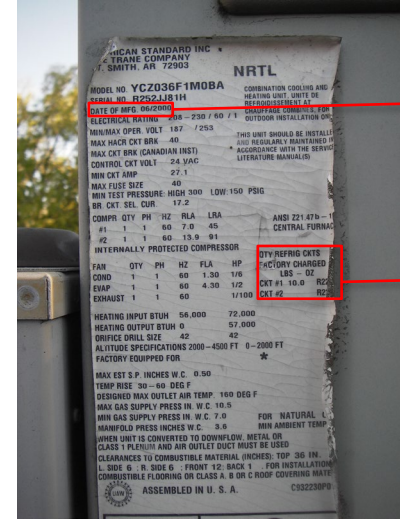
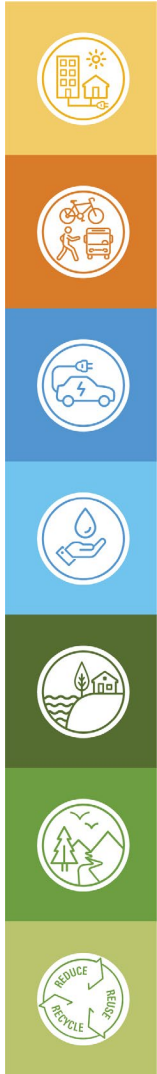
***Additional emissions reduction opportunities to meet 80x30 goal?***





- **Higher retrofit costs than like-for-like replacements**
- Reluctance to replace equipment before end of the equipment's useful life
- Lack of awareness/familiarity with efficient electric technologies
- Reluctance to install unfamiliar equipment
- Physical space constraints
- Staff training for operations and maintenance

# Opportunity for Non-Residential Building Electrification



Date of Manufacture (June 2000 in this example)

Refrigerant type & quantity charged (R22 in this example)

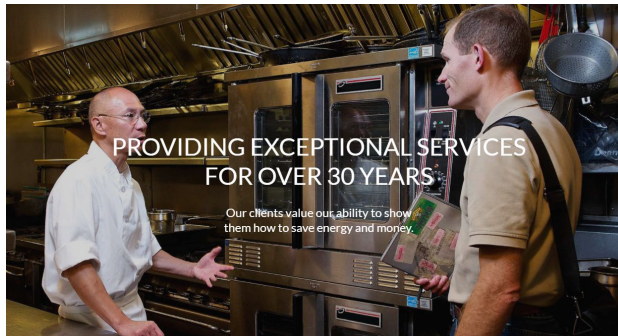
*R22 (Freon) phase-out is completed as of January 2020*



**Target end-of-life conversion of mixed fuel rooftop HVAC units installed prior to 2000**



All-electric preferred reach code for non-residential new construction projects (effective 4/2020)

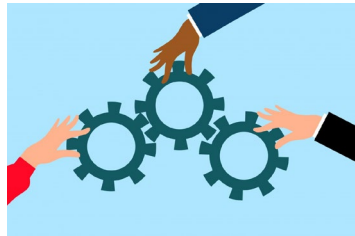
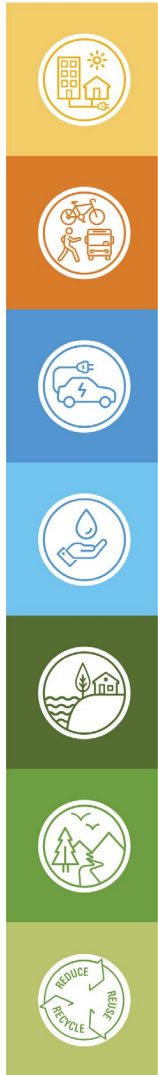


Kitchen Electrification consultation service



Commercial electrification incentives for HVAC replacement, water heater replacement, commercial kitchen equipment

Track age + location of mixed-fuel rooftop packaged units



Non-residential building electrification program to provide technical assistance to support voluntary electrification (Q1 2022)



Engage large commercial customers and PAUSD in the City's S/CAP process

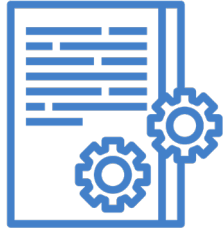


Adopt all-electric mandate for non-residential new construction projects

Adopt GHG emissions benchmarking ordinance for buildings over 25,000 sq.ft.



Conduct electrification assessment of city facilities



Legal feasibility of end-of life electrification mandate for targeted gas equipment



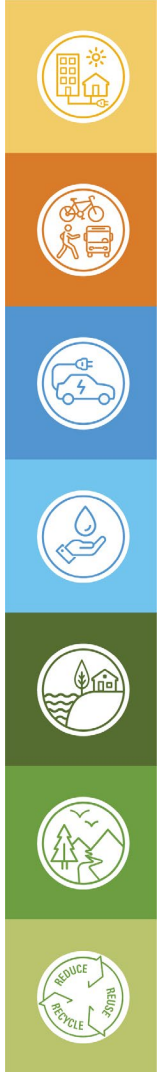
Consider other policy options such as: building emissions performance standard, time-of-sale mandate, carbon pricing



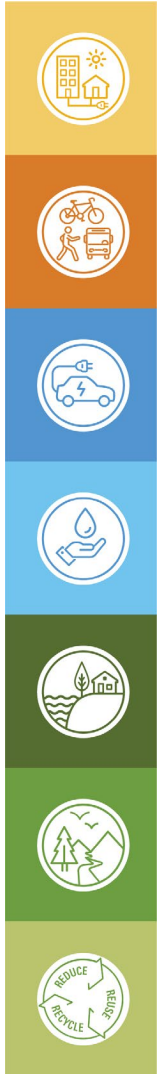
Outreach to commercial property managers, building owners, contractors



# Proposed 2021-2024 Key Actions for Non-Residential buildings



	GHG impact
[E2] Launch non-residential program services and incentives for electrification of non-residential gas-fired equipment.	
[E5] Adopt an all-electric reach code for new non-residential construction.	
[E6] Conduct an Electrification Assessment of City facilities, and develop a plan to reduce 80% of natural gas use by 2030.	
[E8] Adopt City ordinance to require GHG emissions benchmarking for commercial & multi-family buildings over 25,000 sq.ft.	
[C2] Work with major employers to develop custom emissions reduction plans to address commute, building and other emissions.	
[C5] Present options for Council consideration to reduce building emissions, e.g. building emissions performance standard, carbon pricing, on-sale or replace-on-burnout ordinances.	



## ***Peninsula Conservation Center***

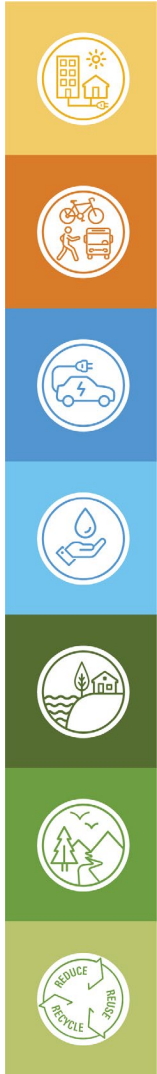
Replace mixed-fuel packaged HVAC units with heat pump systems (8)

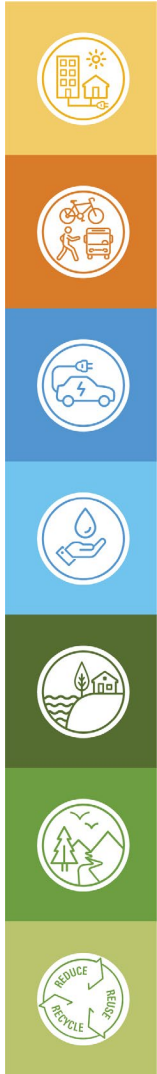


## ***Zola***

Planning to retrofit gas kitchen equipment with electric alternatives

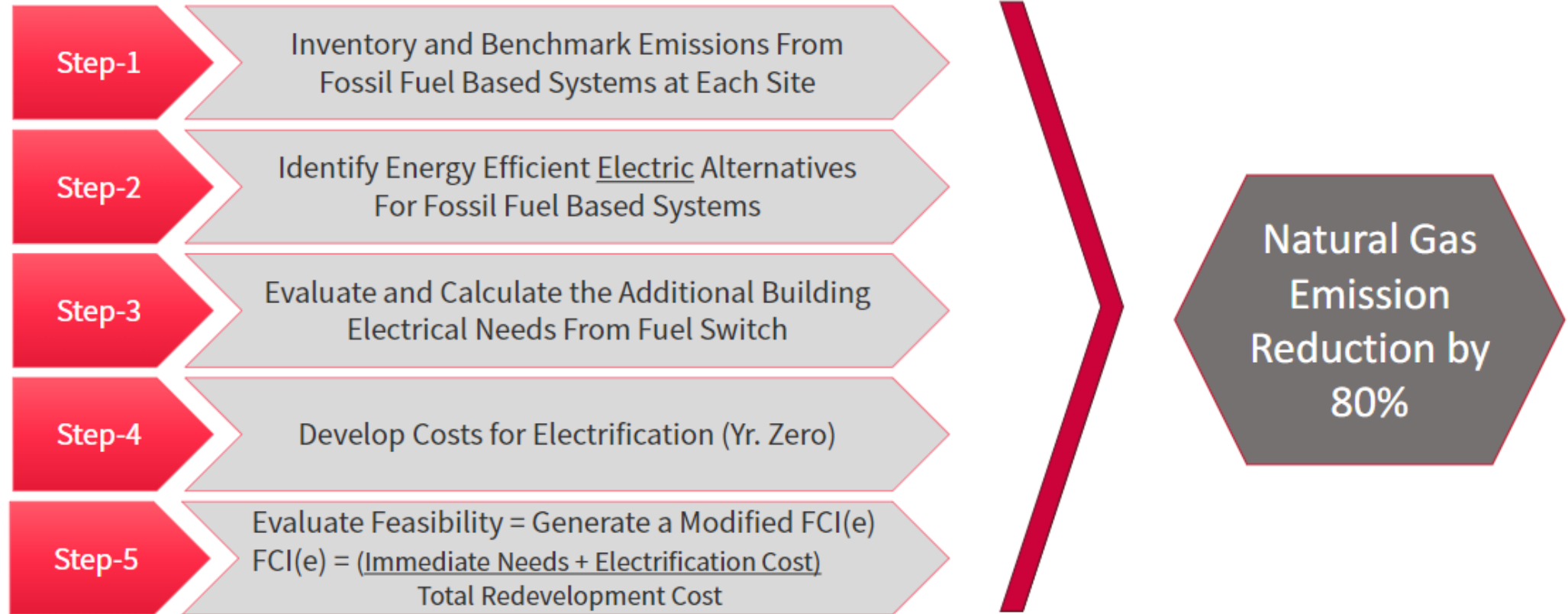
# Electrification Assessment of City Facilities





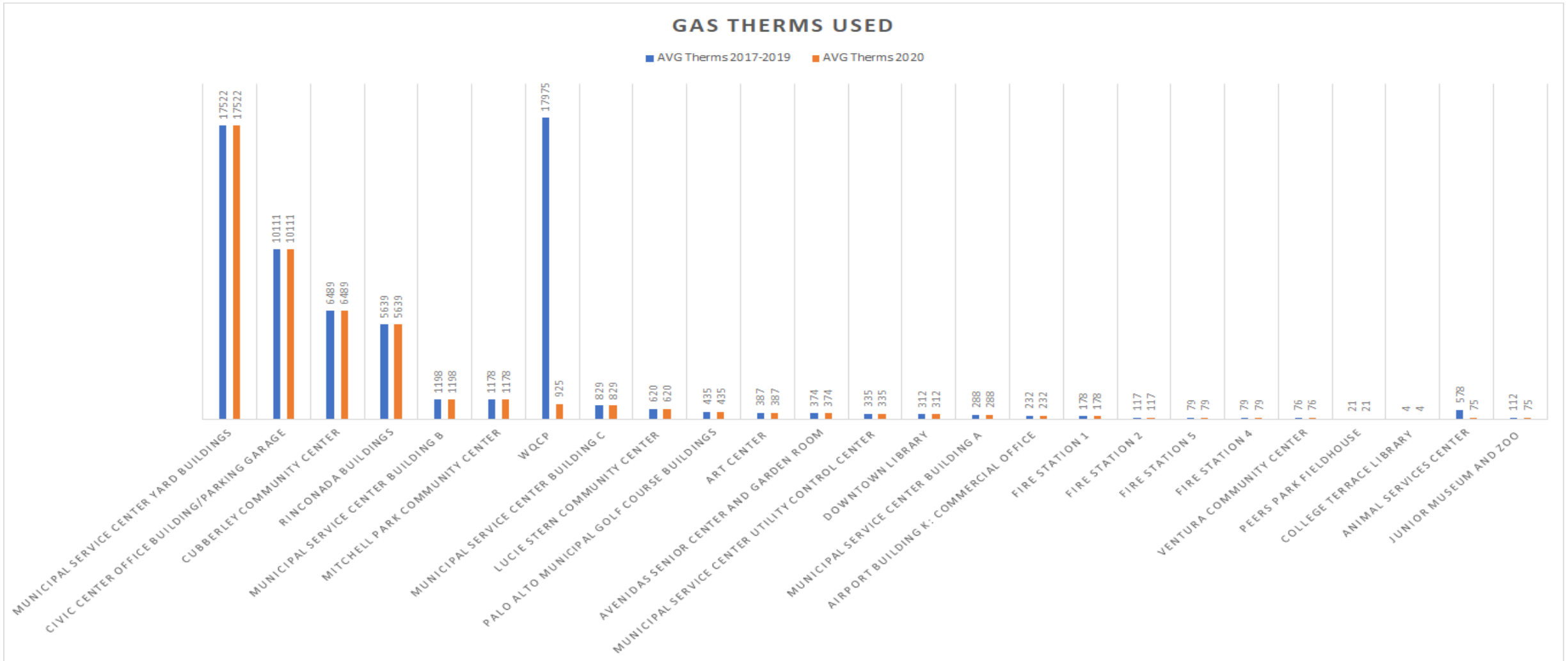
## ELECTRIFICATION APPROACH

REDUCING PALO ALTO'S GAS USAGE BY 80% (2030)



# Electrification Assessment of City Facilities

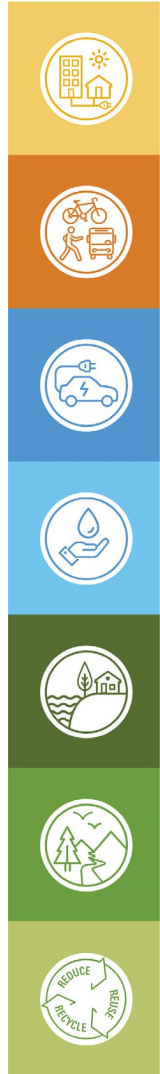
47 of 141 buildings using GHG burning equipment at the following twenty-five locations



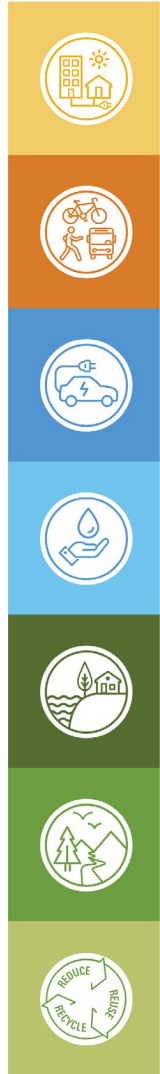


- Facilities with electrification challenges (e.g. structural constraints)
  - Civic Center Office Building/Parking garage
  - Cubberley Community Center
  - Rinconada buildings
  - Mitchell Park Community Center
  - Lucie Stern Community Center
  - Ventura Community Center





# Permitting for Building Electrification







## Variables that Influence Electrification Policy



- State Mandates (Energy Reach Codes)
- Local Adoption / Cost Effectiveness Studies
- Incentive Programs & Local Mandates
- Infrastructure Capacity
- Building Readiness
- Permit Processing



- Electrification Permits = 7% of Permit Activity
- Permit Processing Times / Inspection Criticisms
- UAC / Recent Enhancements
- Performance Improvement
- Solar App+

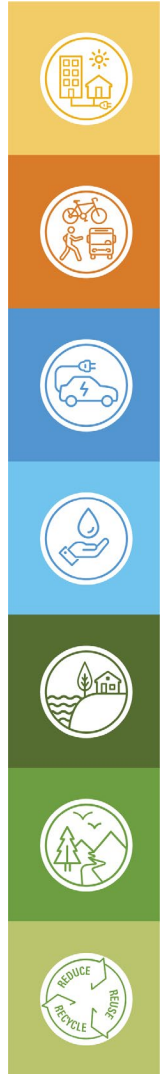


## Streamlining Initiatives Completed or Underway

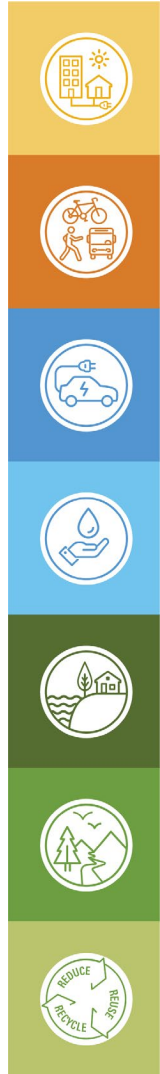
- Prioritized Electrification Reviews
- Automated Daily Progress Report
- Inspector Cross-Training
- Inter-Departmental Coordination Meetings
- Enhanced Problem Solving
- Evaluated PA Requirements to Other Jurisdictions
- Updating Checklists: Submittal, Plan Review, Inspection
- Meeting w/Trade Professionals
- Exploring Technological Solutions
- Developing Customer Feedback Surveys
- Planned Website Improvements



- Clear communications to public about what is required
- Technical Assistance program to support preparation and submission of permits
- Direct installation - work with a single contractor to do the installs
- Vetted contractor's list
- Contractor training
- Make sure installations are ready to meet Palo Alto permit requirements
- "Plug and Play" permit options and/or appliances
- Flat fee for panel upgrades
- Grid Capacity - ongoing studies of how to ensure our distribution grid can handle increased electrification as gas appliances are switched out
- Work ahead/or as capacity allows to upgrade transformers (using City funds)
- Enhanced online permitting options



# Near-Term (2021-2022) Funding and Resources





- Several programs are underway with existing resources. Examples:
  - Expansion of residential electrification services to include technical assistance, contractor vetting, and/or turnkey installation services
  - Expansion of multi-family vehicle charger programs to include turnkey installation services
  - Expansion of non-residential HVAC and kitchen electrification programs
  - Mobility pilot programs (e.g. micromobility, on-demand transit)
- Roughly 12 FTE are currently devoted to S/CAP programs
- Some programs proceeding slowly due to limited staff capacity
- Limited management capacity for S/CAP implementation slows progress
- Some programs have limited capacity – insufficient to achieve goals



- Impacts to City Operations (permitting, utility infrastructure) are a critical limiting factor in achieving near-term S/CAP goals
- Time needed for operational planning, new technology evaluations, and business process improvements is exceeding staff capacity
- Higher permit volumes need additional in-house and/or contract staff
- Recruitment/retention issues, lack of experienced staff means adding resources is not an immediate fix
- Efforts in progress to address recruitment/retention issues, more support needed



- Studies to develop mandates or to plan for post-2024 S/CAP activities need to be done alongside 2021-2024 implementation, outreach, and S/CAP adoption and should start in 2021-2022. Examples:
  - Evaluating and presenting options for near-term and longer-term mandates, pricing, or other policy tools to accelerate electrification
  - Operational planning to accommodate permit volumes ten times those expected in the near term (2021-2024) period
  - Identifying additional emissions reductions to reach 80% by 2030 (impact analysis only identified 71%) and evaluating carbon neutrality goal
- Staff capacity for this function is limited. If studies move slowly, City will not be prepared to scale up activities post-2024, slowing progress toward 80x30 goal





- Potential Funding Sources, FY 2022 to FY 2024 include:
  - Grants
  - Low Carbon Fuel Standard revenues
  - Electric Public Benefits revenues
  - Revenue associated with State Cap and Trade Program
  - Ratepayer revenues
  - Electric Special Projects reserve
  - Palo Alto Green equivalent voluntary surcharge
- All of the above sources have limitations. Discussions in progress with Attorney’s Office to evaluate funding source potential



## November 4 (new date)

- **Transportation**

- Electric Vehicles and Infrastructure



## December 9

- **Transportation**

- Mobility Programs
- How Land Use Affects Emissions





- New S/CAP Update Survey

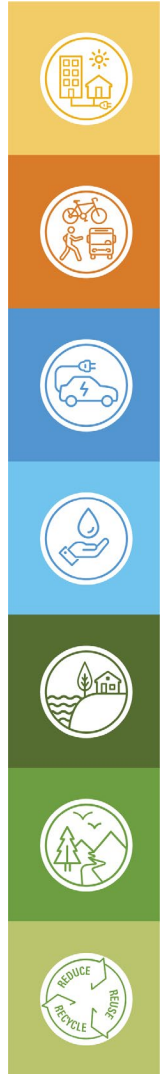


- Energy, Mobility, Electric Vehicles, Water, Climate Adaptation and Sea Level Rise, Natural Environment, Zero Waste



- [https://www.opentownhall.com/portals/5/Issue\\_11175](https://www.opentownhall.com/portals/5/Issue_11175)







1. Are there other intermediate goals that the City should consider for the non-residential building sector?



2. What are some ways that the community can help to support non-residential building electrification?



3. What are some ways that the City can acknowledge community business leaders who are electrifying their businesses?



You can also submit comments and questions to [sustainability@cityofpaloalto.org](mailto:sustainability@cityofpaloalto.org)





## **SUSTAINABILITY & CLIMATE ACTION PLAN**

**Thank You!**

Please submit questions or comments to  
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*Acting Now for a Resilient Future*



CITY OF  
**PALO  
ALTO**