UCDAVIS

FACILITIES MANAGEMENT

Watts Up with Residential Electrification?

<u>Purpose</u>



Electrify My Home, an innovative HVAC contractor has built a business around replacing dirty gas appliances with clean electric heat pumps. They've come to us seeking tools and guidance for ways to simplify a customer's electrification journey.



to California

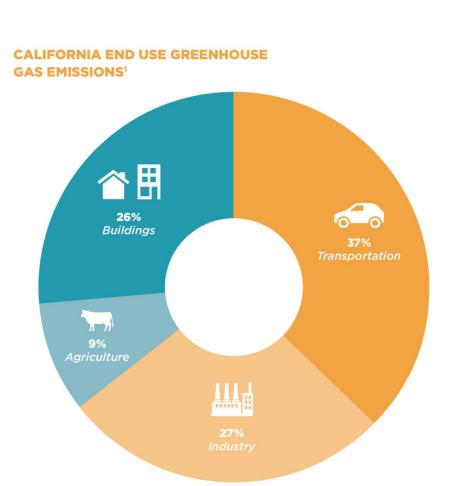
Lower Energy Use Achieved through electrification due to efficient electric

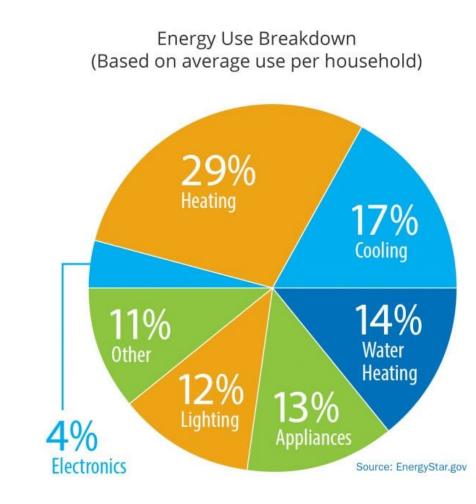
Lower Carbon **Emissions** Achieved through electrification due to efficient electric

technologies



of children are more likely to suffer asthma symptoms in homes with gas stoves than in homes with electric stoves





Methodology



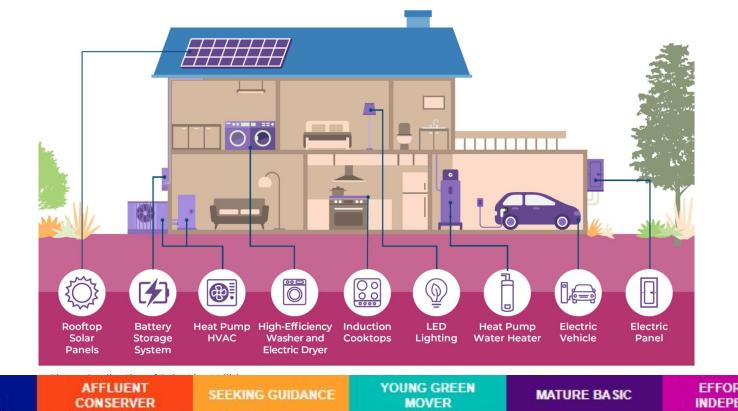
Surveys were used to understand what prior knowledge an average homeowner may have on residential electrification to identify knowledge gaps and what communication styles would be most effective. Google Forms was used to send questionnaires, and was limited to homeowners in Northern California.

Conducting research in the electrification process, best sales approaches, and psychology of potential customer bases gave a basic framework for the team to base the deliverables on.



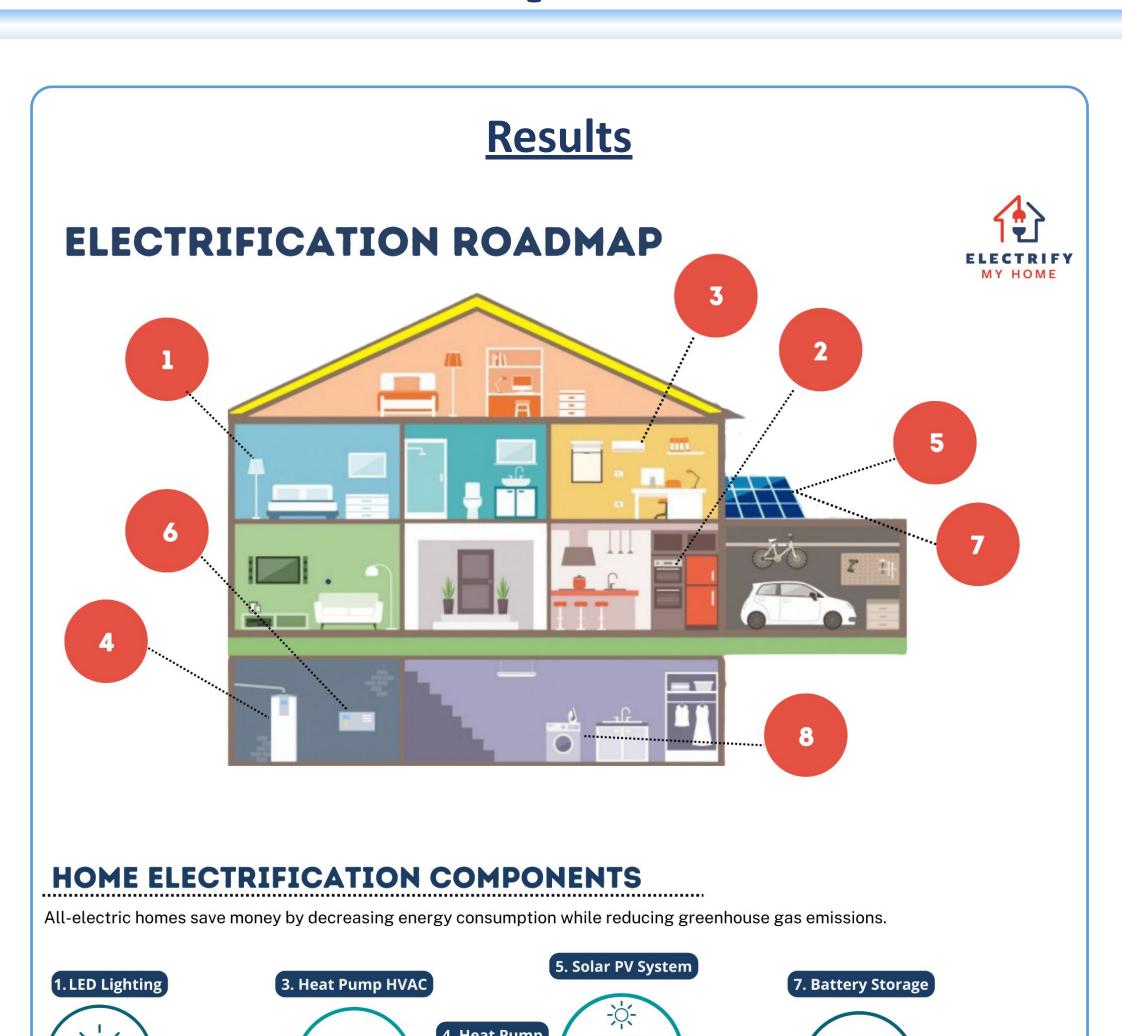
Deliverables: Roadmap visualizing home electrification with an accompanying manual addressing the knowledge gaps customers may have

Reference Material





National Grid Customer Archetype Guide



Available Technologies

meet the energy

demand of a

6. Electrical



pans using

electromagnetic

lighting with low

ELECTRIFY MY HOME

Heat Pump Water Heater \$1,200 - \$1,500

ulls heat from the air to neat the water; 2-3 times

raditional water heaters

Replaces both gas furnaces and air

onditioners. Air source

heat pump

heating or cooling up



8. Heat Pump Clothes Dryer

it to remove moisture from

clothes - reusing

the air once moisture

by solar during the day

to be used at night



Induction Cooktop \$2,000 - \$4,000

Electric Dryer

\$1,000 - \$3,000

Heat Pump ~ \$10,000

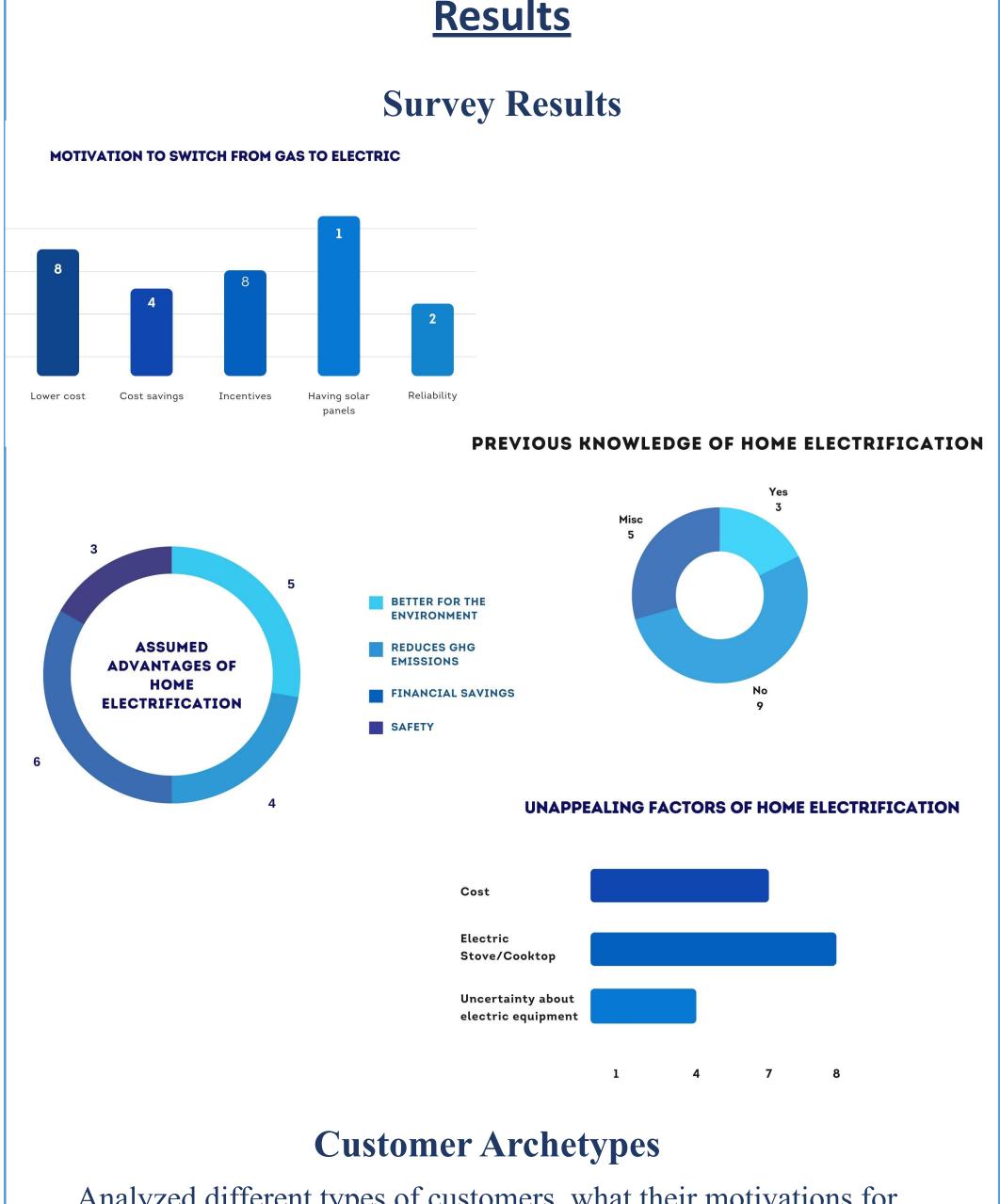




Rooftop Solar Panels 13 kWh storage ~ \$16,000

Battery Storage 13 kWh storage ~ \$16,000

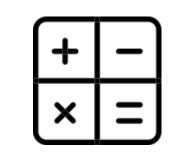




Analyzed different types of customers, what their motivations for electrifying may be, and key selling points







The Analyst

The Saver

The Environmentalist

HOMEOWNER FACT SHEET **Building Electrification Benefits**

Reduces Energy Use

- Efficient electric technologies can lower energy use by
- over 40% and carbon emissions by over 75% Lower energy use = lower monthly utility bills = lower annual cost spent on utilities

Creates Healthy Homes and Living Environments Gas appliances emit air pollutants that can lead

- to indoor air having more pollutants than outdoor air. Children living in homes with gas stoves are
- 42% more likely to suffer asthma systems than homes with electric stoves

Increasing Costs of Gas

 Cost of maintaining gas infrastructure is increasing with added costs falling onto ratepayers, while the cost of efficient electric appliances is decreasing

Incentive Program	Eligible Upgrades	Administrator
Energy Efficiency Upgrades Rebates	Heat pump water heater, induction cooktop, service panel upgrades, solar + storage	Community Choice Aggregators (CCAs)
Residential Energy Efficiency Rebates	High efficiency heat pump water heater	Pacific Gas & Electric
SMUD Energy Efficiency	Heat pump water heater, ductless mini-split, HVAC replacement	SMUD
Home+ BayREN	Heat pump water heater, induction cooktop, heat pumps, heat pump dryer	Bay Area Regional Energy Network (BayREN)

Conclusion

Future Work



Web-based application where customers can input their gas **iwww** appliances and receive recommendations and cost estimates for electric alternatives

Expaninging manual to include holistic methods to promote energy efficiency such as HVAC sealing, switching out light bulbs, and smart control devices.



Addressing Equity

Opportunities	Challenges	
Multiple Languages	Cost Effectiveness	
Survey Diverse Demographics	Different Levels of Awareness	
Easy to Understand	No Bandwidth to Tackle Electrification	

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