Electrifying Existing Residential Buildings in Alameda

2021 IPA project

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The Team

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1. Project Background

Project Scope

- Electrification, efficiency, and weatherization
- Best practices
- Focused on existing building decarbonization
- Emphasis placed on cost, emissions reductions, and equity

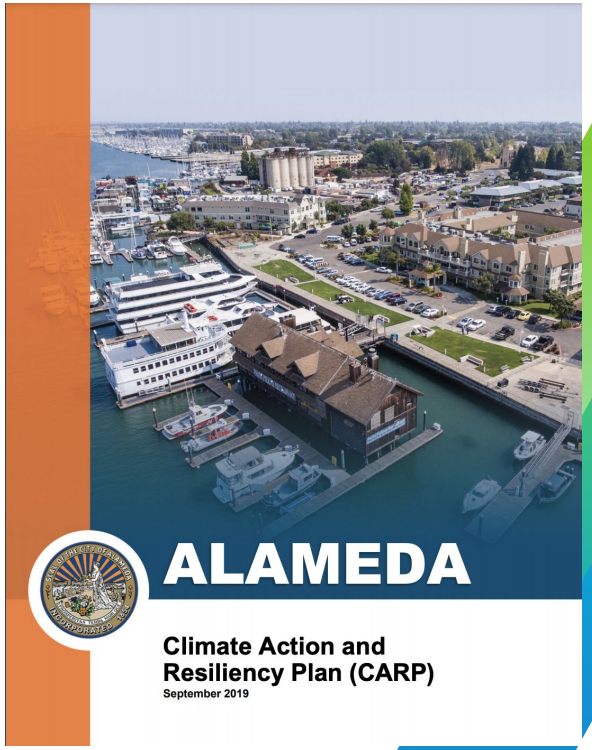
CASA
Community Action for a Sustainable Alameda

RICHARD AND RHODA
GOLDMAN SCHOOL
OF
PUBLIC POLICY
UNIVERSITY OF CALIFORNIA BERKELEY

ALAMEDA

Alameda Goals

- 100% carbon free electricity
- All electric new building reach code
- 2019 Climate Action Resiliency Plan
  - Reduce emissions by 50% below 2005 levels by 2030
  - Cut existing building emissions by 8,283 tons of CO_2
  - Electrify 3,819 dryers and 382 water heaters



Benefits of Electrifying

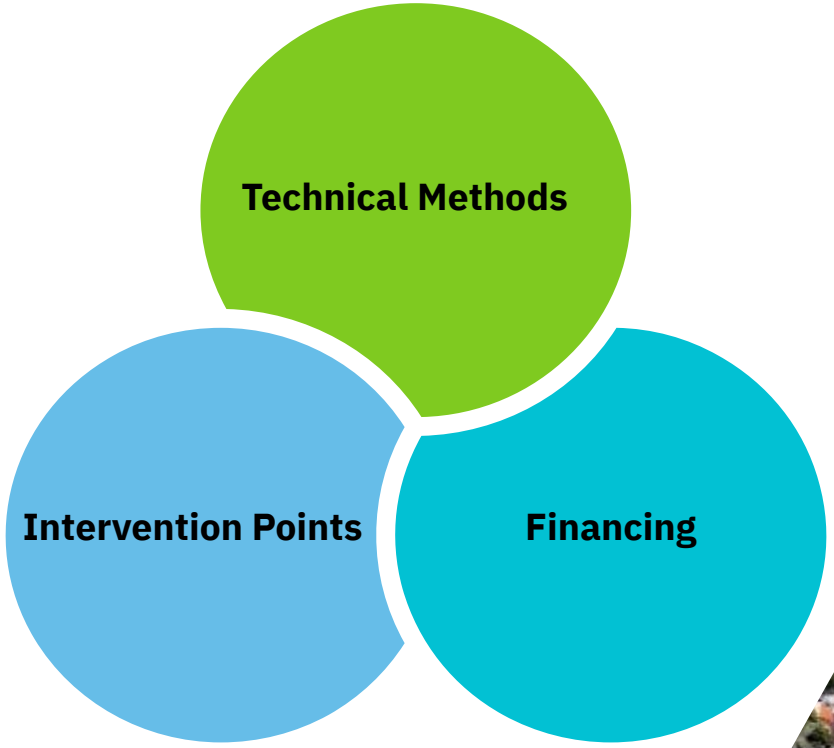
Greenhouse Gas Reductions

Cost Savings

Improve Health and Indoor Air Quality

2. Decarbonizing 101

Three Elements of Decarbonizing Buildings



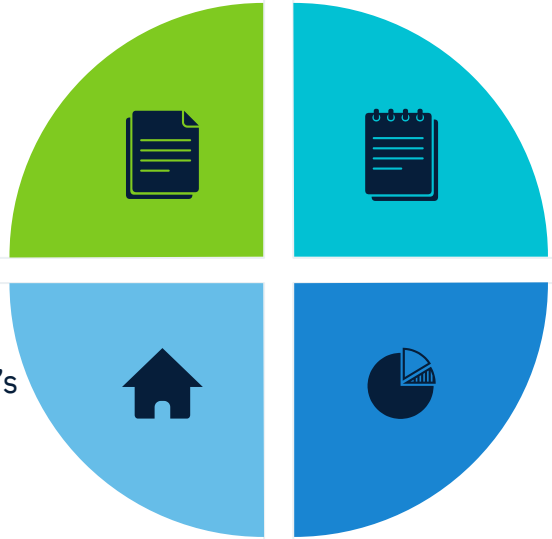
Analytical Methods

Literature Review

- Past Alameda work
- Identification of electrification and weatherization best practices
- Points of Intervention

Case Studies

- Piedmont
- Berkeley
- Santa Monica
- SMUD
- Inclusive Financing



Housing Analysis

- Alameda Tax Assessor's Data
- Alameda Transfer Tax
- Alameda Construction Permits

Reduction Analysis

- Frontier Report Estimates

3. Results

Weatherization and Electrification Techniques

- Attic Insulation
- Air Sealing and Weather-Stripping
- Cool Roof
- Raised Floor Insulation
- Wall Insulation
- Window Replacement
- Duct Sealing
- New Ducts
- Duct Insulation
- Water Heater Blanket
- Low Flow Fixtures
- LED Lighting
- Exterior Lighting Controls
- Ducted Heat Pump
- Heat Pump Water Heater
- Photovoltaics (solar)
- Energy Storage
- High Efficiency Air Conditioning
- Hot Water Pipe Insulation

Housing Analysis

- 17,470 Residential Buildings: Single and Multi- family houses

Type	Year Built	Number	Square Footage	Bedrooms	Units
Single	NONE	483	329.89	0.61	0.22
	pre-1978	10,421	1,645.03	2.99	1.06
	1978-1991	2,654	1,984.98	3.03	1
	1992-2010	1,426	2,326.00	3.62	0.99
	2011~	104	2,417.13	3.75	0.37
	Total	**15,088**	**1,732.41**	**2.99**	**1.01**
Multi	NONE	571	7,713.53	12.29	8.99
	pre-1978	1,782	4,245.02	6.35	5.26
	1978-1991	20	3,873.30	7.8	6.85
	1992-2010	8	14,875.00	3.88	6.5
	2011~	1	2,814.00	6	2
	Total	**2,382**	**5,108.45**	**7.77**	**6.17**

Transfer Tax

- 165 deed transfers per month
- 1,989 deed transfers per year
- 8-10 years to sell all houses*

Permit Results

	C404 2019	C404 2020	Total (average of 19/20 combined data)
Average Permit Value	$16,398.55	$21,199.02	**$18,443.19**
Permits Issued	3193	2369	**2781**
Total Value of Permits Issued	$52,360,578	$50,220,470	$102,581,048
Minimum Permit Value	$0	$0	$0
Maximum Permit Value	$3,135,700	$19,186,511	$19,186,511
1st Percentile	$0	$0	$0
10th Percentile	$500	$520	$500
25th Percentile	$1,000	$1,000	$1,000
Median Permit Value	$6,450	$6,000	**$6,000**
75th Percentile	$13,500	$13,500	$13,500
90th Percentile	$26,500	$26,500	$26,500
99th Percentile	$150,000	$150,000	$150,000

4. Recommendations

Points of Intervention

Point of Sale

- Required Energy Audit of Score
- Potential Panel Upgrade or Electrification
- Refundable Electrification or Weatherization Tax

Point of Permit

- Potential Split Fee Structure
- Efficiency Projects at Specific Permit Values
- Potential Requirements with AC, Solar, and EV installation

Burnout

- Education and outreach around electrical appliances
- Burnout requirements in Phase 3

Financing

Split Utility User Tax

- Higher tax on natural gas vs. electric power

Refundable Electrification Transfer Tax

- Refunded if electrification/ weatherization happens in first year after sale

Inclusive Financing

- Allows for low-income families to electrify

Rebates

- Increase amount of rebates and available rebate options

Existing Building Decarbonization Phases

Phase One

1. AMP website updates and homeowners
2. Energy audit disclosures for renters and homeowners
3. Begin education and outreach
4. Administrative Background work for Phase Two

Phase Two

1. Point of Sale
2. Permit Intervention
3. Financing
4. Hire technical advisor
5. Begin AHA pilot programs

Phase Three

1. Commercial & industrial
2. Multifamily building requirements
3. Update cost-effectiveness analysis
4. Gas shut off date

Credits

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- Danielle Mieler and Ruth Abbe with the City of Alameda
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- And many others

Questions?

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Images

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