# Is There a Heat Pump in My Future? Suggestions for the Los Altos Environmental Commission (11/14/2022)

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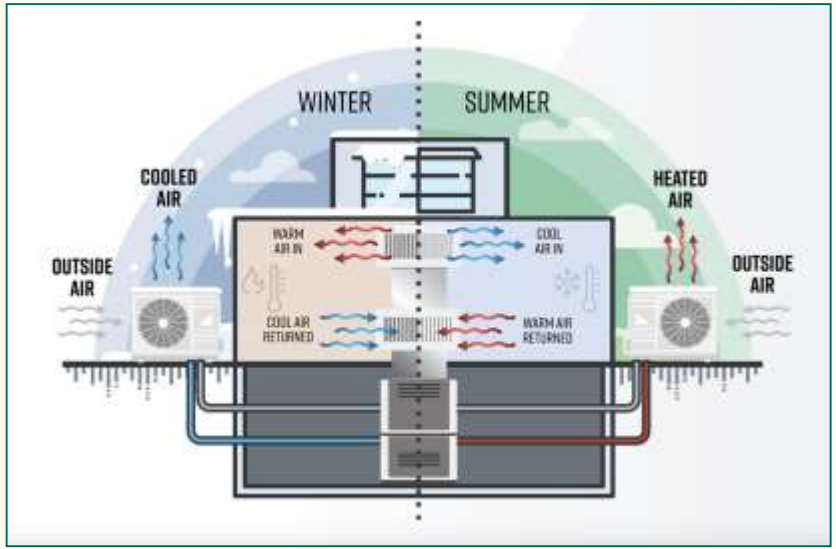
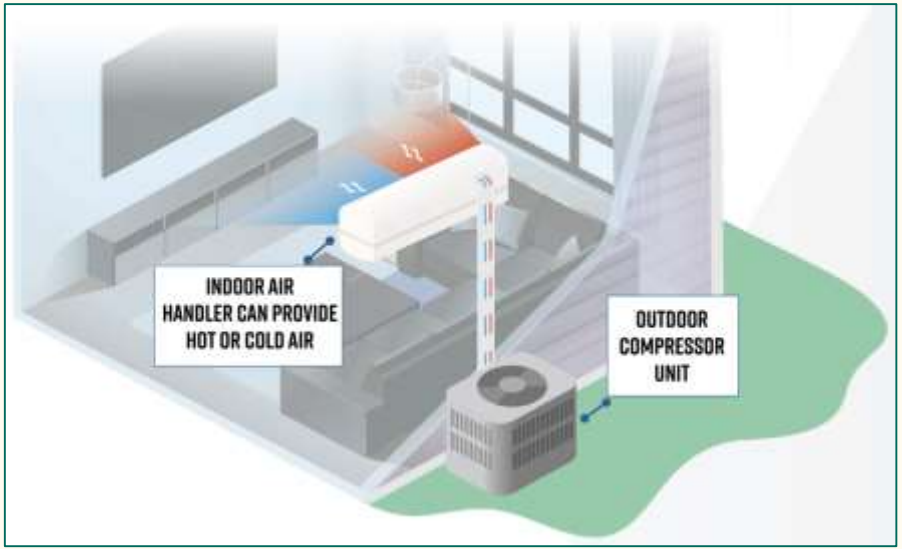
# A Brief Introduction

- Our research
  - San Jose State University
  - Collaboration with GreenTown Los Altos
  - Goal: Design public program on heat pump technology
  - How our research was conducted
  - Library discussion 10/26/2022


# Space Heating/Cooling (Air Source)

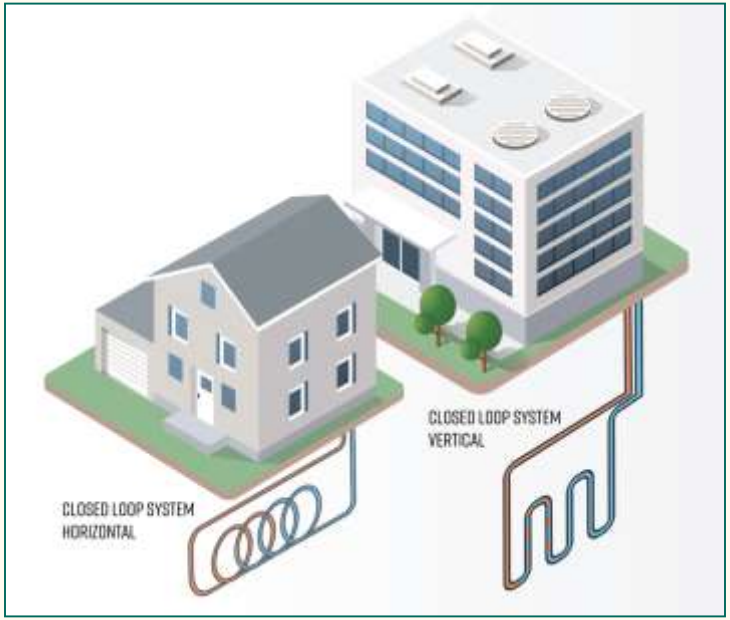



Ducted Air Source Heat Pump



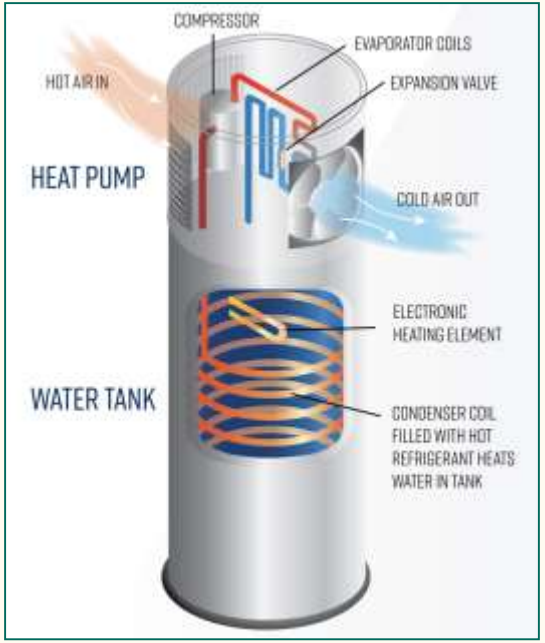

Ductless Air Source Heat Pump

# Space Heating/Cooling (Ground Source)




Ground Source Heat Pump Loops

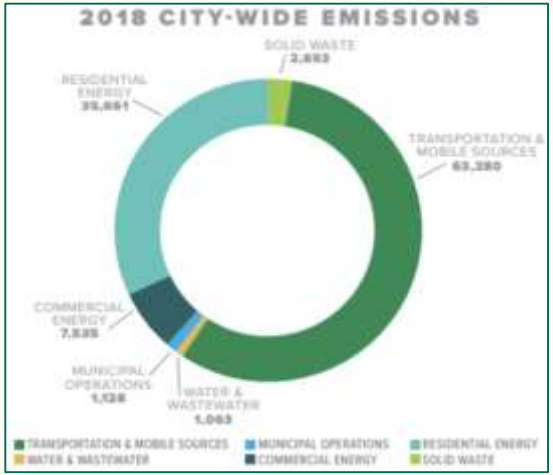
# Water Heating




Hot Water Heat Pump

# Why are Heat Pumps Important?

- Los Altos emissions by sector
  - Residential: 32%
- Climate Action & Adaptation Plan
  - The City of Los Altos has series of mitigation and adaptation actions
  - Residential building electrification
  - 2035 deadline




2018 City-wide Emissions


Mitigation and Adaptation Actions

# Average Cost Breakdown

- Single-family heat pump HVAC system:
  - Average total project cost (before incentives): $21,212
- Single-family heat pump water heater:
  - Average total project cost (before incentives): $6,461
- Incentives:
  - Inflation Reduction Act
  - Rebate programs (BayREN, SVCE)

# Home Electrification Incentives (IRA + Local)

| ITEM | IRA DISCOUNT | LOCAL DISCOUNTS |
|---|---|---|
| Heat Pump Air Conditioner/Heater | $2,000 Tax Credit<br>$8,000 Upfront Discount | $2,500 Rebate for efficient heat pumps (BayREN and SVCE) |
| Heat Pump Water Heater | $2,000 Tax Credit<br>$8,000 Upfront Discount | $2,000 Rebates for efficient heat pumps (BayREN and SVCE) |
| Electric Panel | $600 Tax Credit<br>$4,000 Upfront Discount | $1,000 SVCE Rebate |

Note: Many rebates and discounts are aimed at low to moderate income households and may not apply to you. Program features are continuing to be developed, modified and are subject to change.

# Benefits of Heat Pump Systems

- Dual-purpose
- Energy efficient
- Increased lifespan (+20 years)
- Low maintenance
- Eco-friendly
- Cost savings

# Potential Barriers

- Upfront cost
- Each home is unique (extra work may need to be done)
- Electrical panel may need to be optimized or upgraded
- Minor lifestyle changes

# Resources

- Installing HVAC, EV chargers, and more...
  - Locating a contractor
  - Tools on SVCE website
    - **The Switch is On**
    - **BayREN**
- Calculating savings:
  - **Rewiring America**


# Resident Feedback

- Questions on basic understanding of how systems work
- Does this system make sense for me? (return on investment)
  - What system makes sense for me? (Air-source vs. ground-source)
  - Integration with current systems vs. replacement of current systems
  - Suggestion: Establish at what point it makes sense for homeowners (ex: Top 50% of nat. gas consumers)
- Questions on how to reduce initial cost
  - Lack of understanding of incentives and tax credits (dependant on income?)
  - Information spread out through various organizations (BayREN, SVCE, Tech Clean CA, etc.)
  - Suggestion: create one location where residents can learn information on initial cost and incentives/tax credits
- Operating costs not clear
  - Tradeoff between electrical cost and gas cost
- Lifestyle concerns
  - Heat recovery time
  - Noise (duct & compressor)
- Contractor issues
  - Locating
  - Evaluating bids

# Thank You for Listening!

# References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