

# Building Emissions Saving Ordinance (BESO)

## Energy Upgrade Requirements

November 1, 2023



# Background and Current BESO Requirements

# Residential Energy Conservation Ordinance (RECO)



- Started in 1987
- Required 10 minimal energy/water measures at point of sale or remodel
- Buyer to install within 12 months

## Lessons Learned

- One size doesn't fit all
- Wasn't getting to deep GHG reductions

**City of Berkeley** Residential Energy Conservation Ordinance (RECO) Certificate of Compliance **FORM A**

Escrow Closing date: \_\_\_/\_\_\_/\_\_\_ Address of Property: \_\_\_\_\_ Unit # \_\_\_\_\_  
Title Company: \_\_\_\_\_ Escrow #: \_\_\_\_\_  
Structure \_\_\_ of \_\_\_ Number of units: \_\_\_\_\_ (NOTE: Each structure requires a separate Form A) Circle one: PASS FAIL

Acceptance of this form by the City deems the property to be in compliance with RECO (Ordinance 6099, BMC 19.16). It is given to property owners by the RECO inspector after a satisfactory RECO inspection. File this form with: City of Berkeley Building & Safety Division, 2120 Milvia St., Berkeley, CA 94704; Telephone 981-7440. A \$20 filing fee is required for each residential structure. The maximum required expenditure for meeting the requirements of this Ordinance is 0.75% of the final sale price for the property. See below.

**KNOB & TUBE WIRING Notification** (Attach Electrician's safety inspection report, if applicable.) YES NO N/A  
If Knob & Tube wiring is in the attic, has a licensed electrician inspected, signed & posted a safety notice in the attic?

RECO MEASURES:	Complete	Incomplete	N/A	Unit #
1. Ceiling insulation of minimum thermal resistance value R-30 installed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	___
2. Furnace heating ducts sealed at plenum and all joints in heating duct system sealed with mastic and insulated to a minimum of R-3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	___
3. Hot water pipes in pumped, recirculating domestic water heating systems insulated to a minimum thermal resistance of R-3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	___
4. All domestic storage water heaters insulated to a minimum total of R-12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	___
5. All exposed hot and cold water pipes within at least 24 inches of water heater are insulated to a minimum thermal resistance of R-3, except within 6 inches of single-wall flue and one inch of a double walled flue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	___
6. Installed low-flow faucet devices or fixtures with a maximum flow rate of 3 gallons/minute in all showers; a maximum of 2.75 gallons per minute in all sinks and lavatories; and a maximum of 4 gallons/minute in all other faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	___
7. Installed toilet fixtures designed to use no more than 1.6 gallons per flush, or existing fixtures modified to reduce the amount of water used while ensuring correct operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	___
8. Approved weatherstripping must be installed on all exterior doors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	___
9. Approved dampers, doors, or other devices to block air flow and reduce heat loss through chimneys are installed and working	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	___
10. Multi-unit structure common area light fixtures have lamps of at least 25 lumens per watt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	___

**NOTE:**  If any items are checked "INCOMPLETE" because the maximum required expenditure for this sale has been met, check here and attach itemized receipts for RECO measures (with an explanation, if necessary) and note the maximum required expenditure amount.

Final Sale Price \$ \_\_\_\_\_ X 0.0075 = \$ \_\_\_\_\_ City Inspector: \_\_\_\_\_ Date: \_\_\_\_\_

Seller/Owner: \_\_\_\_\_ (Type/Print Name)  
Seller/Owner: \_\_\_\_\_ (SIGNATURE)  
Address: \_\_\_\_\_  
Phone: (\_\_\_\_) \_\_\_\_\_

Buyer: \_\_\_\_\_ (Type/Print Name)  
Buyer: \_\_\_\_\_ (SIGNATURE)  
Address: \_\_\_\_\_  
Phone: (\_\_\_\_) \_\_\_\_\_

Inspector Name & Agency: \_\_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_  
Inspection Fee paid by: \_\_\_\_\_ Amount paid: \$ \_\_\_\_\_  
Filing Fee (\$20/structure) paid by: \_\_\_\_\_ Amount paid \$ \_\_\_\_\_

ORIGINAL: Building & Safety Yellow: Owner Pink: Inspector

# Zero-Emission Appliance Rule



Bans the sale and installation of **NEW** gas water heaters and furnaces

## No Gas Water Heating

- **2027** – Smaller buildings
- **2031** – Medium/large buildings

## No Gas Space Heating (HVAC)

- **2029** – All buildings



**BAY AREA**  
**AIR QUALITY**  
**MANAGEMENT**  
**DISTRICT**

# Building Emissions Saving Ordinance (BESO)

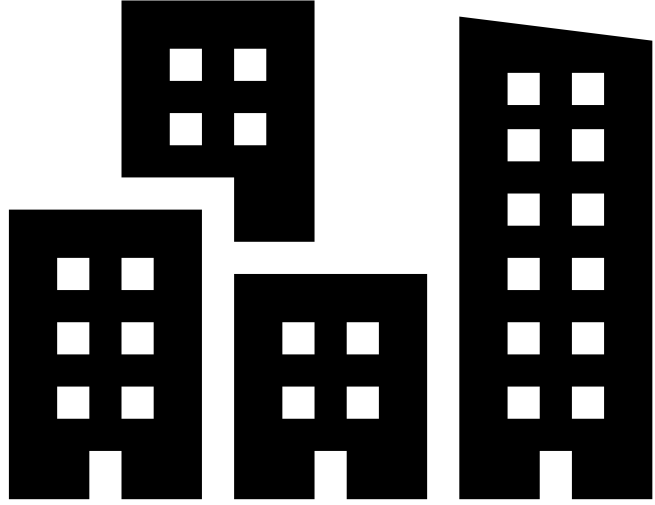


## Time of Sale Program



Buildings **less** than  
25,000 sqft

## Large Building Program



Buildings **greater** than  
25,000 sqft

# Existing Building Policy Timeline



## Small Residential: Time of Sale



## Medium/Large Buildings: Building Performance Standard (BPS)

# BESO - Time of Sale Program

- Requires an **energy/electrification assessment** prior to listing a building for sale.
  - Home Energy Score for Single family homes
  - Provides information to potential buyers
- Refers building owners into local incentive programs to complete voluntary upgrades



# Policy Objectives



 Accelerate building electrification upgrades

 Promote early compliance

 Align with available resources

 Ensure smooth sales process

 Provide flexibility in required upgrades

 Ensure renters are protected



# Technical Advisory Committee



## Members:

- Building Decarbonization Experts
- BESO Assessors
- Architects
- Electrification Contractors
- Utilities
- Regional and State entities



Local Governments Empowering Our Communities



# Outreach/Engagement



- Bridge Association of Realtors
- Environment and Climate Commission
- Berkeley Rent Board – Sustainability Committee
- Real Estate Professionals - Webinar
  - 1,000+ invited
  - ~100 attendees
- Realtor Office Engagements
- City Green Building Coordination Team
- **Upcoming:**
  - Berkeley Property Owners Association
  - Community and Environmental Organizations



# Proposed Upgrade Requirements

# Flexible Building Performance Standard

- Buildings need to achieve minimum number of credits through upgrades
- **Rationale:**
  - Addresses range of building conditions
  - Owner can prioritize
- **Potential point criteria:**
  - Energy savings (emissions)
  - Cost
  - Health, safety, resilience bonus

Upgrade Measure	Credits
Heat Pump Water Heater	6
Heat Pump HVAC	6
Panel Upgrade	4
Attic Insulation	2
Wall Insulation	2
Air Sealing	1
High Home Energy Score	TBD
Etc.	...

# Potential energy upgrade measures



## Electrification

- Heat Pump Water Heater
- Heat Pump HVAC
- EV Charging Station
- **New! - Bi-Directional EV Charger**
- Induction Range

## Electric Ready

- Replace knob and tube
- Panel upgrade (if below 100 amps)
- Pre-wiring & 240v outlets
- Smart Panel

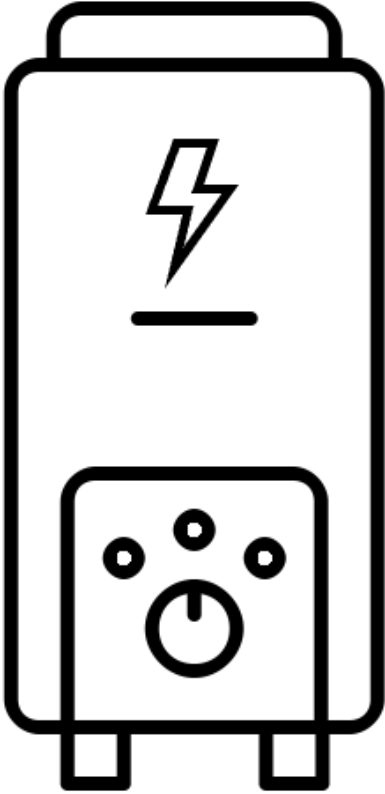
## Energy Efficiency

- Duct Sealing/Replacement (Verified)
- Attic Insulation
- Wall Insulation
- Window replacements
- Air Sealing (Verified)
- Floor Insulation/Crawlspace Improvement

## Resilience

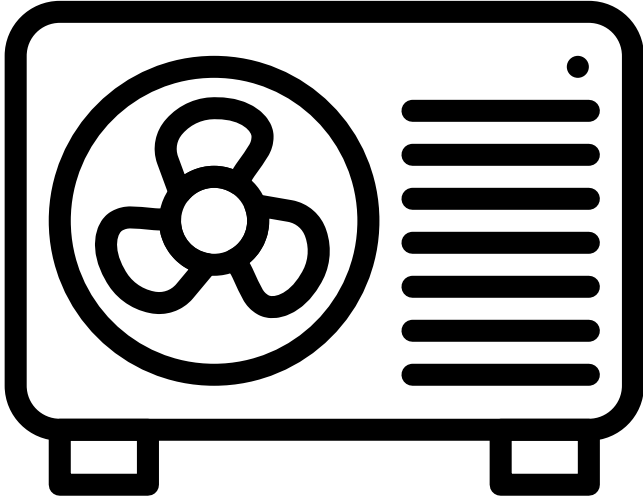
- Solar PV Installation
- Battery storage installation
- **New! - Greywater system**

# Exemption Pathway: Heat Pump System



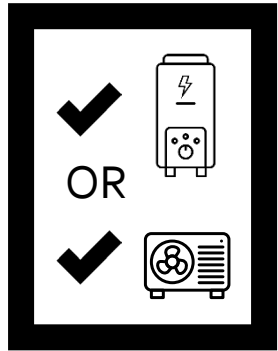
**Water Heating**

**OR**



**Space Heating/HVAC**

# Example: Home *has* a heat pump system



Seller completes assessment  
(Home Energy Score)

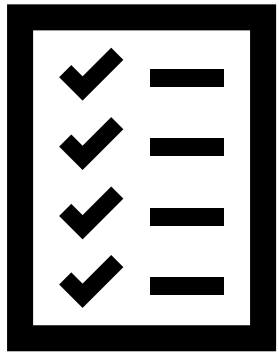


Home listed for  
sale

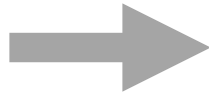


Fully Compliant, no  
upgrade needed

# Example: Home *doesn't* have a heat pump



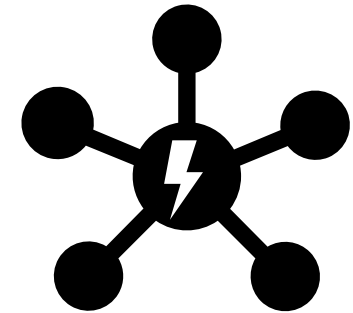
Seller completes assessment  
(Home Energy Score)



Home listed for sale



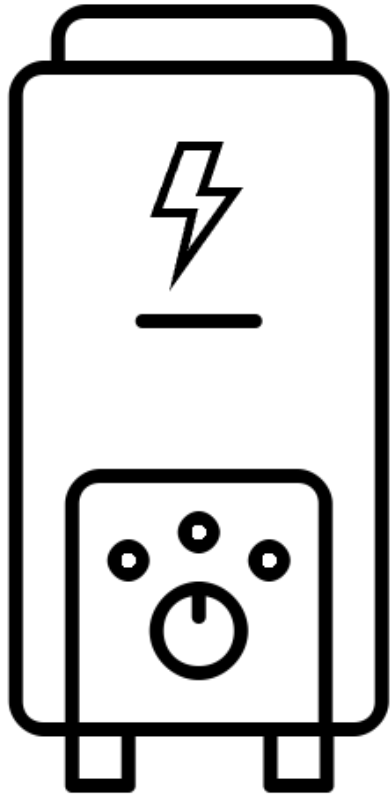
Funds to cover upgrades negotiated at closing through escrow deposit



Buyer completes Energy Upgrade(s) to meet target credit requirement and utilizes escrow deposit



# Example Compliance Cost



**Heat Pump  
Water Heater**

**Average Cost (Equipment + Installation):**  
**\$6,800**

Program	Incentive Amount
IRA Tax Credits	\$2,000
BayREN Home+	\$400
TECH Clean CA	\$3,100*
AVA HPWH Contractor Incentive	\$1,000**
<b>Total</b>	<b>Up to \$6,400</b>

**Average Cost after rebates:**

**\$300 - \$1,300**

\* Just launched - rebate range \$3,100-\$7,300

\*\*Contractor chooses passthrough amount

# Covered Building Phase-in

- **Phase I: Single-family, ADUs, Duplexes, New! - Condos within 1-4 unit buildings**
  - Expected implementation 2025
  - Likely to be owner-occupied
  - Bulk of sales
- **Phase II: 3-4 Units**
  - Expected implementation by 2027 or sooner
  - Use lessons learned from Phase 1
  - Likely to be rental properties
  - Complex/shared systems
  - Need to develop additional support systems



# Berkeley Sales Analysis

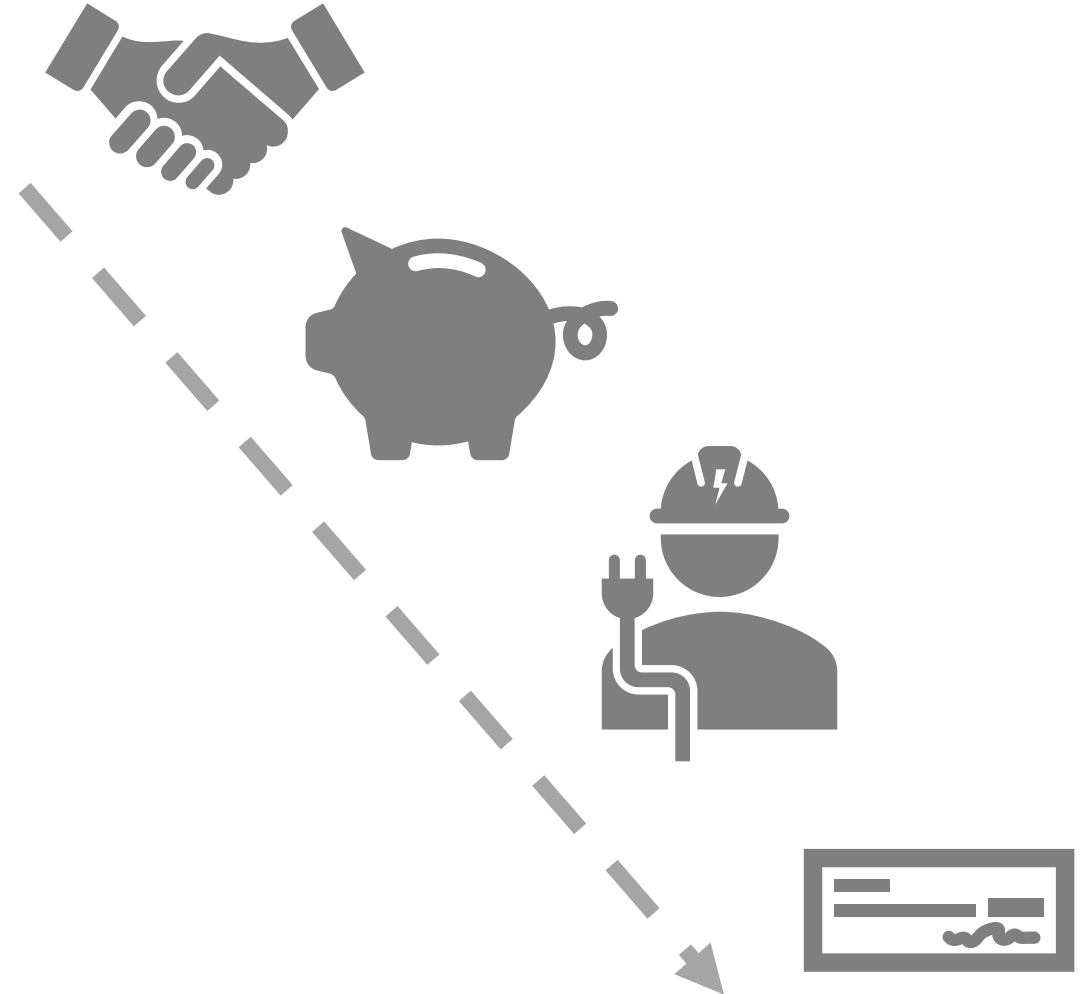


Building Type	Avg. # of Buildings Sold per Year	% of Sales
Single Family	600	61%
Duplex	60	6%
Condominiums (within 2-4 Unit Buildings)	30	3%
3-4 Units	50	5%

# Escrow Deposit



- Operate similar to Private Sewer Lateral
- Buyer/Seller negotiated
- Deposit sent from escrow to City
- If compliance requirements not met, buyer has up to 2 years to complete upgrades
- Refunded once property is compliant
- After 2-years the funds are forfeited to the City and could be used to help fund low-income electrification programs



# Proposed Exemptions/Support



- **BESO Exemptions:**
  - **All-electric homes** with permits showing capped gas line
  - **Refinances** and **partial transfers**
  - Income qualified **First Time Home Buyers**
- **Support:**
  - **Assessment support** for income qualified sellers
  - Credit for **High Home Energy Score**
  - Ability to obtain **early refund**
  - **Hardship** extensions and deferrals



# Questions



# Proposed Policy Components



- **Covered Buildings:**

- Phase I: Single family homes, Duplexes, ADUs, condos
- Phase II: 3-4 Units

- **Requirement:**

- Flexible (credit based) Building Performance Standard **OR**
- One heat pump system

- **Buyer vs Seller Responsibilities:**

- Seller: Assessment
- Buyer: Complete upgrades (*if no heat pump system*)

- **Implementation:**

- Utilize escrow bond/deposit process

- **Exemptions:**

- All-electric homes
- Refinances and partial transfers
- Qualifying First-Time Home Buyer

# Thank You!



## **Ammon Reagan**

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