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Greenlighting Clean Heat: Modernizing Permits for Heat Pumps

A roadmap for streamlining and standardizing clean heating installations, and hastening building electrification efforts

Acknowledgements

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The findings and recommendations in this report are SPUR's and do not necessarily reflect the viewpoint of any acknowledged persons. Any errors are SPUR's alone.

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Executive Summary

California and the Bay Area are transitioning from gas-powered building equipment to zero-emission alternatives like heat pumps to eliminate health harming, climate warming emissions from buildings. While state and regional policies and regulations are driving this shift, the region's fragmented permitting systems have not evolved to support electrification, creating significant barriers to progress.

Challenges

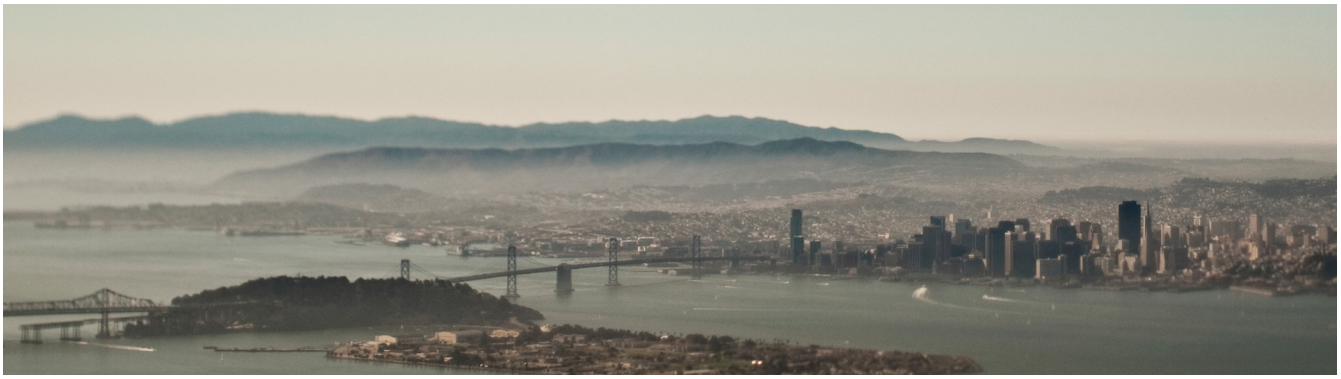
The Bay Area's municipalities operate under inconsistent permitting processes that often disadvantage heat pump installations. These antiquated systems are characterized by complex and sometimes contradictory requirements across jurisdictions, restrictive zoning and planning codes, excessive documentation needs requiring specialized subcontractors, multiple permits for single installations, unpredictable inspection processes, and high and variable fee structures.

These obstacles have led to widespread non-compliance, with permit acquisition rates for heating equipment typically below 20%. The costs of obtaining permits falls disproportionately on those using clean energy rebates and incentives, which require permit verification, while gas appliance installations continue without oversight. This undermines California's ambitious target of 6 million heat pump installations by 2030 and the Bay Area Air District zero-emission equipment rules.

Benefits of Reform

Streamlining and standardizing permits would:

- Improve health and safety through better code compliance
- Free up building departments to focus on complex, high-risk projects
- Accelerate clean heating adoption by removing bureaucratic bottlenecks
- Enhance customer experiences with predictable, simplified requirements
- Reduce costs associated with obtaining permits
- Make heat pumps more competitive with gas equipment
- Ensure public funding for clean energy isn't wasted on unnecessary red tape



San Francisco
Source: Envato Elements

Key Recommendations

SPUR recommends the following actions for state and local actors to modernize heat pump permitting, and prepare our communities for the clean heating transition.

1. The California Legislature should pass permit streamlining and standardization legislation for heat pumps, such as SB 282 (Weiner) proposed this year.[1]

2. The California Legislature should pass legislation directing the California Building Standards Commission to pilot remote inspection and self-certification programs statewide, with the goal of creating statewide requirements to participate in these alternate permitting and inspection pathways.

3. The California State Licensing Board (CSLB) should develop new state code, guidance, and certification programs to expand the proportion of the workforce that can legally install a heat pumps.

4. The California Buildings Standards Commission should establish a Fuel Switching Code Advisory Committee and work with the International Code Council (ICC) and/or National Fire Protection Association (NFPA) to develop recommendations for a state-wide fuel-switching code.

5. Cities and counties should pass local ordinances that address planning code, permitting, and inspection frictions for heat pump installers.

Introduction

California and the Bay Area are in the midst of a historic transition from polluting gas equipment in buildings to high-efficiency zero-emission equipment like heat pumps for water and space heating.[2] Zero-emission appliance rules, building codes, and state and regional climate action plans are pushing the heating appliance market and consumers toward a gas-free future for buildings. Bay Area jurisdictions are key actors in this transition and must prepare their planning ordinances, permitting processes, and local codes to encourage "fuel-switching" from gas to electric appliances. Municipalities currently operate under a patchwork of permitting and inspection processes that vary significantly across the Bay Area's 101 municipalities. Many of these jurisdictions have done little to update these processes to accommodate heat pumps and other electric equipment. The process is often cumbersome, requiring installers to subcontract various work, endure long wait times, and navigate complex and sometimes contradictory requirements to install a single home appliance. These requirements further incentivize contractors to sidestep permitting altogether.

Increasingly, the Bay Area permit and inspection landscape for heating equipment is antiquated, fragmented, and unused. This will prove a barrier as the Bay Area's water and space heating equipment rapidly transitions to electric heat pumps.

Streamlining permitting in the Bay Area could improve safety and permit compliance across clean appliance installations, assist in meeting our state goal of installing 6 million heat pumps by

1 SB 282 was placed on suspense file by the California Senate Appropriations Committee on May 23.
2 Heat pumps are electric compressor driven systems, like used in refrigerators or air conditioners, that can move heat efficiently from a "source" to a "sink" by raising the temperature of that heat and releasing it to the destination)

2030, and support implementation of the Bay Area Air District zero-emission rules.[3] A rational and predictable system for permitting could generate a range of benefits:

- **Better health and safety:** Simpler, more accessible permits will improve code compliance and facilitate the removal of gas equipment with greater safety risks.
- **Accelerated clean heating investments:** Since public incentives for heat pumps require permit verification, streamlining the process ensures public funding for clean heating isn't bogged down in bureaucratic red tape.
- **Improved customer experiences:** We must protect the reputation of clean technologies by smoothing the path to adoption, and eliminating negative experiences caused by byzantine local requirements.
- **Reduced cost of heat pumps:** Cutting "soft costs" is necessary to close the affordability gap between heat pumps and gas heating equipment.[4] Every hour spent on paperwork, drafting special planning documents, and navigating red tape is an hour qualified contractors aren't spending helping customers fuel-switch. These "time-and-effort" costs are often passed on to customers, tightening the supply of labor, and further raising project quotes.[5] High permitting and inspection fees only add to the cost burden.

HVAC Installation
Source: Envato Elements

The Permit Maze

HVAC and water heater permitting should follow a predictable path. Homeowners hire an installer who can quickly and easily purchase a permit from the local building department by completing a standard set of application requirements and learning of any, ideally minimal, local variations from statewide code requirements. Contractors would then complete the installation and go through a predictable building department inspection process that clears the appliance for continued use. While this streamlined process is often an option for gas-for-gas equipment replacements, customers replacing gas equipment with heat pumps frequently face a gauntlet of local requirements that dramatically increase time, effort, and costs. These requirements can look closer to a home addition construction permit than a simple appliance installation, and are sometimes applied to simple same-location installations that involve no major architectural, ductwork, plumbing, electrical panel, or other building systems changes

On the next page, we visualize the various frictions we've identified:

3 Bay Area Air Quality Management District, "Building Appliances," accessed April 22, 2025 link.
4 SPUR, *Closing the Electrification Affordability Gap*, February 26, 2024, link.
5 These time intensive permitting processes drive up costs in two compound ways. They add hours to each project and create those same hours of labor shortage in the contractor market that lead to raising the bid price per hour in order to filter down the workload to the remaining contractor staff time available.

TABLE 1
The Permitting Gauntlet

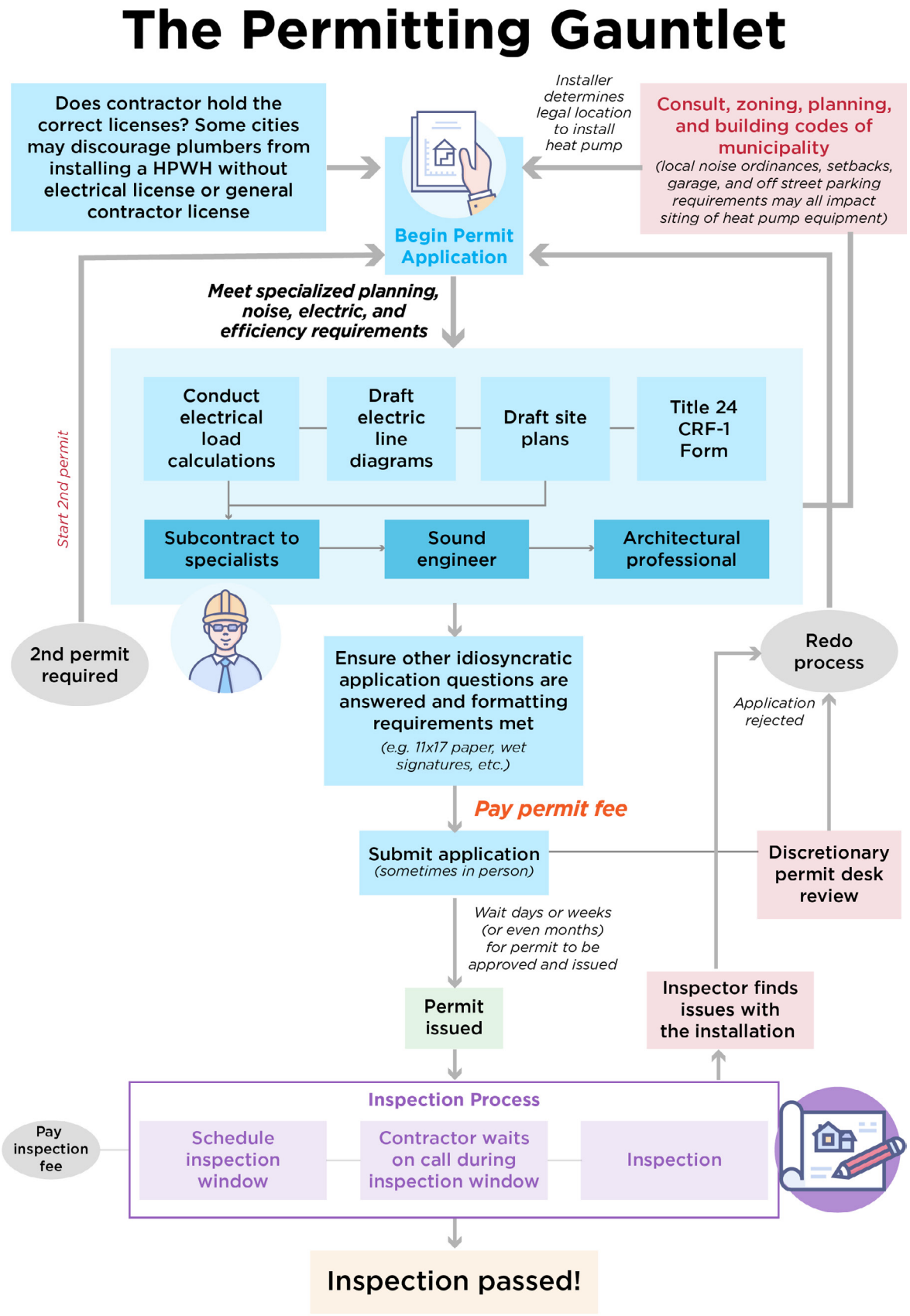
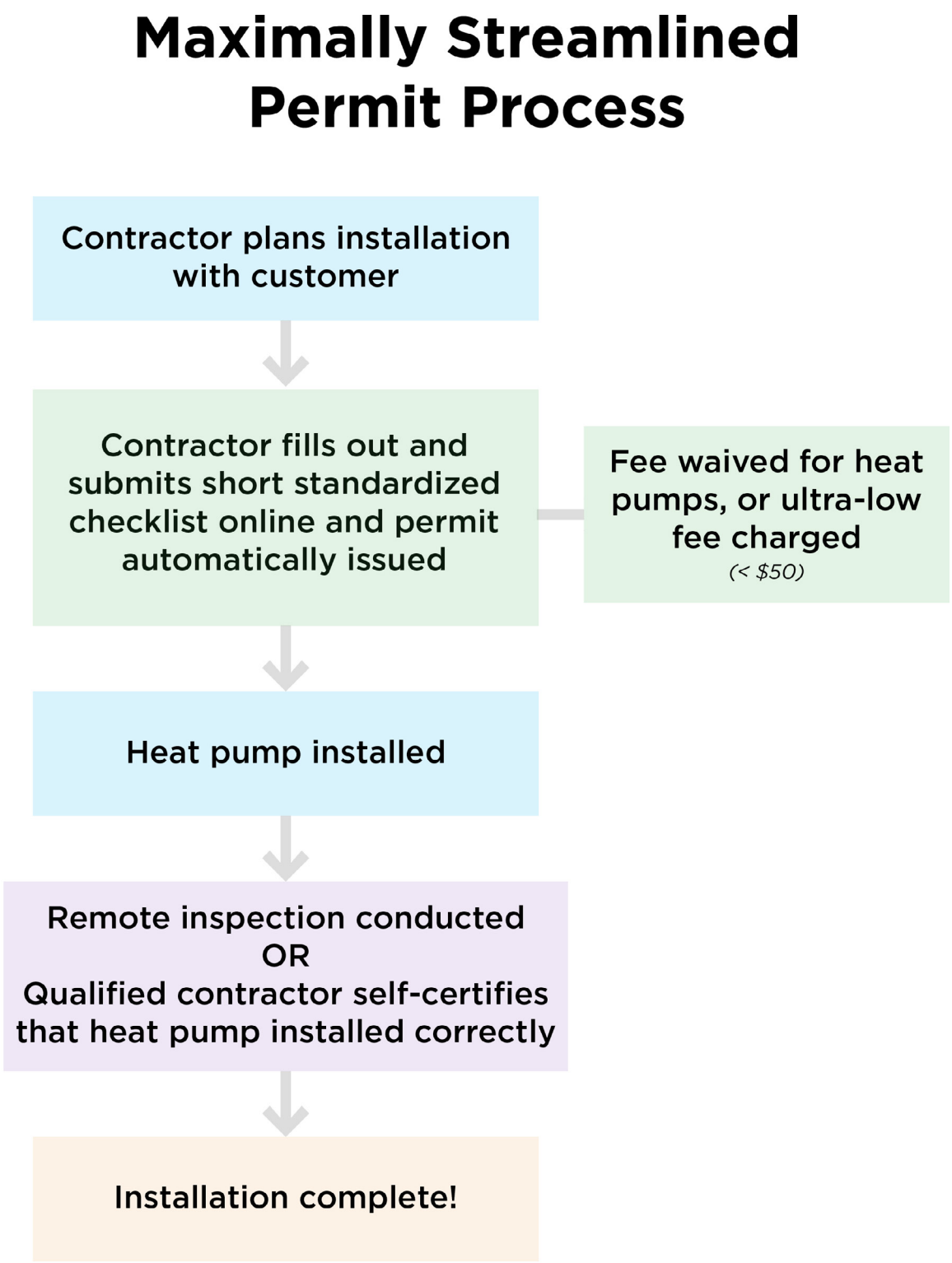


TABLE 2
Maximally Streamlined Permit Process



Problem 1: Restrictive local zoning and planning codes

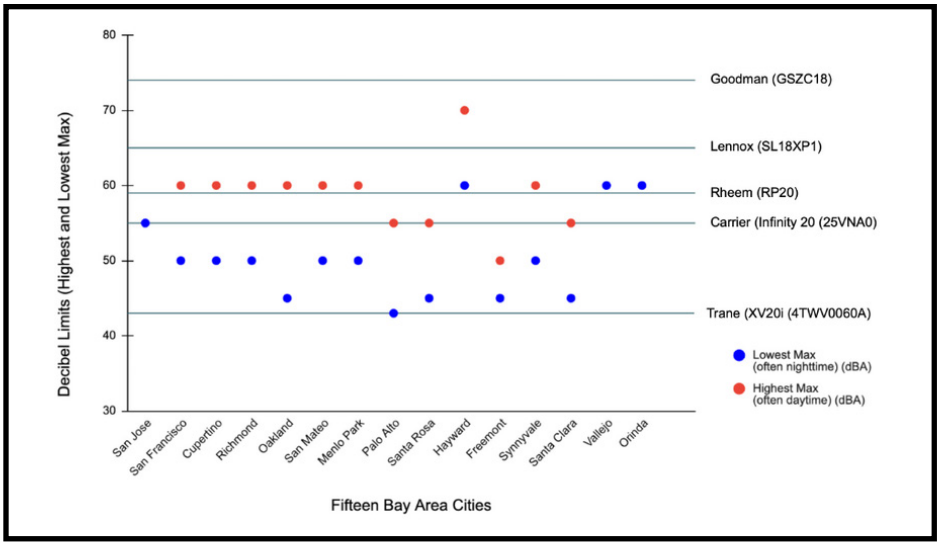
Common split system heat pump HVAC compressors must be located outside, typically in side yards. Many cities have setbacks of five feet or more for detached single family homes, limiting the placement of mechanical equipment like compressors. Heat pump water heaters (HPWH) are sometimes also placed outside in sheds, or in garages where additional planning or building code requirements can restrict placement.

Additionally, municipal noise ordinances in the Bay Area often include decibel (dBA) limits that effectively prohibit installation of common heat pump models. Many of these restricted models are inverter heat pumps, which operate with a continuous cycle that slows down as temperatures stabilize, significantly reducing noise during normal operation. These high-quality units "good neighbor" models produce maximum noise only when responding to a drastic temperature difference. Despite their increasingly dominant market share, these units remain inadvertently restricted by outdated noise regulations.

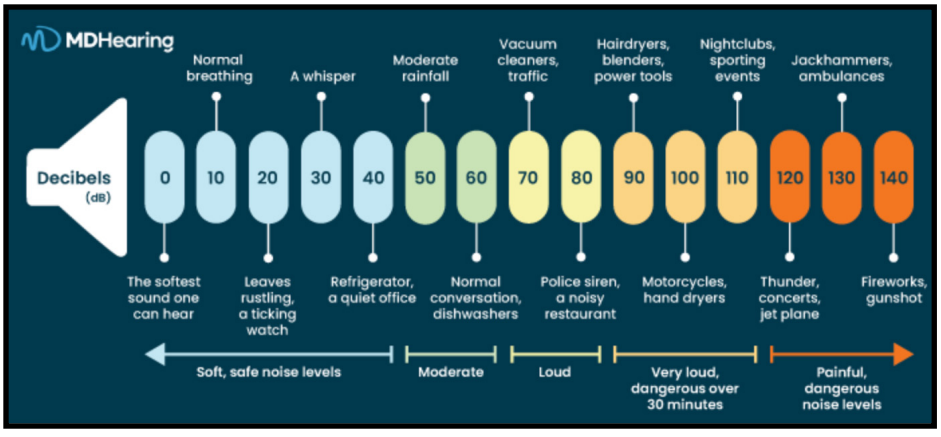
TABLE 3

Ordinances and Heat Pump Noise Ratings for Single-Family-Home Zones

Maximum dBA varies across zones in many cities. Values typically represent measurements taken at about three feet from the noise source (in San Francisco, one meter (~39") is used).[6]



Translating Decibel Levels to Familiar Noises



Carly Sygrove, "Decibel Chart: All You Need to Know," MD Hearing, May 7, 2024.

6 SPUR, Smoothing the Transition to Heat Pumps, Part 1: Code Changes, August 6, 2024, link.

SPUR also found a significant number of cities in the Bay Area with side yard setback requirements of over 3ft.

TABLE 4
Selection of larger Bay Area cities side yard setback requirements (some cities may have exemptions or exceptions for certain equipment or building improvements)
Source: SPUR analysis

CITY NAME	SIDE YARD SETBACK MINIMUM REQUIREMENTS - SINGLE FAMILY DETACHED ZONES[7]
San Francisco	3 ft., 5 ft. required for lots over 25 feet wide in RH-1 zoning.
Oakland	5 ft., 3 ft. for lots up to 50 feet wide.
San Jose	8 ft. otherwise, 5 ft. for lots up to 50 ft. wide.
Cupertino	5 ft., variable per district.
San Mateo	5 ft., increases for larger properties.
Menlo Park	5 ft., variable per district.
Palo Alto	6 ft. (5 ft. for substandard lots). Variable per district.
Santa Rosa	5 ft., 10 ft. for certain districts.
Hayward	5 ft.
Fremont	5 ft., increased for larger lots.
Sunnyvale	5 ft., increased for larger lots.
Santa Clara	5 ft., variable per district

One contractor cited an attempt to install a HPWH outside a client's home due to inadequate indoor ventilation, but the city zoning restricted installation of mechanical equipment 6 feet from the property line. The city suggested relocating it to the other side of the house, which would require extensive plumbing work and add $10,000 in costs. In another city, a contractor noted that building officials told contractors simply that HPWHs "may not be installed outdoors."

Challenges vary significantly with enforcement, with some cities like Piedmont requiring sound engineering studies to verify compliance with their 50 dBA at property line noise limit,[8] with one contractor citing $1200-$1800 in costs to get a sound engineer to write them a letter signing off on heat pump installations.

7 See Appendix 1 for citations
8 City of Piedmont. "Installing a Heat Pump in Piedmont." Accessed April 22, 2025. link.

A Silicon Valley Clean Energy (SVCE) report reviewed zoning barriers to electrification in the South Bay and made recommendations for cities to ease setback and noise requirements, and provide exceptions for mechanical equipment, in particular for heat pumps with inverter systems.[9] Some cities have taken action–Menlo Park amended zoning rules to enable siting of mechanical equipment in setbacks and water heaters in garages, and Palo Alto has taken action to raise decibel limits (though the changes were limited).[10] [11]

Cities may have zoning rules on setbacks, floor-area ratios, landscaping, garage space, and non-conforming uses that can further complicate heat pump siting. Local building codes may also impose outdated requirements—like bollards in garages, raised platforms, and fume ventilation—meant for gas equipment but still applied to heat pump water heaters unnecessarily.

Problem 2: Excessive documentation

To meet local zoning rules, building officials often require contractors to obtain professionally drawn architectural site maps of the entire property. If building officials reject these site maps, contractors may need to re-site the equipment and re-start the application process. Often planning documents require installers to hire an architectural professional or engineer, which can add thousands of dollars in costs to a project. Cities like Berkeley, Menlo Park, Hayward, Redwood City, and Palo Alto even require site plans for HPWHs, which are typically placed inside and are less likely to run afoul of zoning ordinances.[12]

Contractors often report idiosyncratic requirements and inconsistent expectations from plan checkers. One contractor described a Menlo Park project needing multiple site plan revisions and unusual formatting, like 11x17 landscape paper and letterhead with specific instructions. In Berkeley, a contractor noted a project where adding an outdoor HPWH enclosure triggered planning documentation, as the enclosure was deemed "part of the home." The city required these documents be drafted by a licensed architect trained in building plans.[13]

Plan checking is prudent for complex projects like home additions or new builds. But plan checking is usually overkill for replacing equipment in the same location, especially when an inspection is still required to ensure the installation meets code. Contractors will naturally try to meet the code to avoid the expensive fixes required from failing an inspection.

In addition to site plans, electrical permits often require line diagrams mapping all electrical components and connections. While often necessary for complex installations, this is a significant additional plan check when only minor changes to electrical wiring are performed.

Many jurisdictions also require Title 24 forms CRF-1 and CRF-2 related to the state energy efficiency standards for residential and commercial buildings. Replacement of gas heating equipment with high-efficiency heat pumps always improves building efficiency, and many of the contractors SPUR interviewed expressed consternation at the need for this additional documentation that simply confirms that the new equipment will not use excessively more energy than the prior equipment.

9 Silicon Valley Clean Energy. "Siting Outdoor Mechanical Equipment: Extended Guide." Accessed April 22, 2025, link.
10 Gennady Sheyner, "Code Changes Aim to Spark Conversions to Electric Appliances," Palo Alto Online, October 4, 2023, link.
11 BayREN, Zoning Changes Help Electrify Existing Homes, presented by Monika Paz, Q4 2023 Forum, accessed April 22, 2025, link.
12 SPUR review of HPWH requirements across Bay Area municipalities, including plan check requirements.
13 SPUR consultations with multiple Bay Area contractors, anonymous.

Sometimes building departments lack the capacity to quickly review the many requirements included in heat pump permit applications, leaving contractors waiting in limbo. A TECH pilot found the statewide average HPWH permit time is 5.9 days, with some areas taking weeks. In contrast, gas water heater replacements often get same-day, over-the-counter permits.[14] The pilot identified building department knowledge gaps as a key barrier, including burdensome plan checks and misconceptions about HPWH risks, like confusing harmless condensate with the acidic combustion byproducts of gas water heaters.

Problem 3: Multiple permits and inspections

Cities often require multiple permits for a single appliance installation, varying by appliance type and scope of the installation. For example, HPWHs often require separate plumbing and electrical permits, and may additionally require mechanical, planning/zoning, or building permits if the installation involves any framing or architectural modifications.

Our review of HPWH requirements in the Bay Area found it commonplace for cities to require two permits:

TABLE 5
Permits required for HPWHs
Source: SPUR analysis

CITY NAME	NUMBER OF PERMITS	NUMBER OF PERMITS
Belmont	**2**	**Plumbing and electrical**
Berkeley	**1 or 3**	**Plumbing, electrical, and mechanical**
Burlingame	**1**	**Building**
Cupertino	**1**	**Plumbing**
Fremont	**1**	**Mechanical**
Hayward	**2**	**Plumbing and electrical**
Los Altos	**1**	**Plumbing**
Menlo Park	**1**	**HPWH have their own permit type**
Milpitas	**2**	**Plumbing and electrical**
Mountain View	**1**	**Plumbing**
Oakland	**2**	**Plumbing and electrical**

14 Tech Clean California, "Permitting Pilot," accessed April 22, 2025, link.

Palo Alto	1	HPWH have their own permit type
Pleasant Hill	1	Plumbing
Richmond	1	Plumbing
San Francisco	2-4	Plumbing and electrical. Sometimes building and mechanical depending on the project.
San Jose	2	Plumbing and electrical
San Mateo	1	Plumbing
Santa Clara	2	Plumbing and electrical
Saratoga	1	Mechanical
Sunnyvale	1	Plumbing
Los Gatos	2	Plumbing and electrical

In one revealing case, a San Francisco general contractor faced bureaucratic catch-22 when trying to install a HPWH. The city would not issue the necessary mechanical permit without an additional building permit, yet would not issue the building permit because the work included no framing. The city's recommendation was to add unnecessary framing to the project to obtain the necessary building permit—which would have cost an additional $1200 in permit fees and paperwork alone.

These requirements for multiple permits cause cascading problems for homeowners and contractors, who must pay multiple permit fees, hire contractors with multiple certifications, and organize multiple inspections with different inspectors.[15] Often, HPWH installations require minimal electrical work, but if an electrical permit is needed, customers may have to hire an electrician or HVAC contractor instead of a plumber. The state Contractors Licensing Board has determined that plumbers C36 are authorized to install the 240V or 120V circuit needed to power a heat pump water heater as "ancillary work" associated with completing the main project. Unfortunately, many jurisdictions remain unaware of this authorization.

TECH Clean California data found that out of 715 HPWH permits pulled, only 9 were installed by plumbers with only a C36 plumbing license. The vast majority – 654 installations –were done

15 Changgui Dong and Ryan Wiser, "The Impact of City-Level Permitting Processes on Residential Photovoltaic Installation Prices and Development Times: An Empirical Analysis of Solar Systems in California Cities," Energy Policy 63 (December 1, 2013): 531–42, link.

by contractors with a C36 and C20 (HVAC) license.[16] This suggests stand-alone plumbers are simply not entering the HPWH market. If more jurisdictions recognized the CSLB letter confirming C36 plumbers can handle the necessary circuit work and eliminated separate electrical permit requirements, more plumbers would likely pursue HPWH installations, expanding the workforce and increasing competition.

Problem 4: Unpredictable inspections

SPUR interviews with a range of Bay Area contractors found that inspection outcomes varied even within jurisdictions depending on which building department inspector was assigned to the project. Contractors reported that this caused unpredictable results and corrections for the same projects, even in the same jurisdiction.

Building inspectors must often interpret state code themselves across multiple inspection types— plumbing, mechanical, electrical, and structural.[17] When a single heat pump installation requires multiple permits, it must pass several inspections, with each inspector potentially applying different interpretations of state and local requirements. This creates a system where identical installations might receive different corrections based solely on which inspectors are assigned.

Beyond inconsistencies, the inspection scheduling itself creates substantial inefficiencies. Many of the contractors SPUR interviewed reported waiting 2 to 6 hours for inspections that take 5 to 15 minutes — a significant waste of workforce time that could be spent on additional installations.

Problem 5: Permitting and inspection fees can be unpredictable, and expensive

Municipalities calculate permit and inspection fees differently, and don't always offer a standard flat fee for similar projects. This creates arbitrary cost differences and reduces price transparency for heat pump installations. Contractors sometimes absorb these fees to keep quotes consistent, but often they are passed on to customers. Initial project quotes typically factor in expected fees.

Some cities start with a base fee, and then add on fees for different ancillary work. Some also add a charge representing a percentage of total project costs. If you have a 2% fee on a $20,000 project, that is $400 added to the project cost. As a result, fees can vary significantly from project to project.

A Bay Area contractor faced significant barriers when installing a heat pump HVAC system. After paying an $870 permit fee and beginning installation, the Building Department canceled the permit during the inspection phase, claiming "missing documentation" despite clear specifications in the application. The department required additional site drawings and sound-level documentation not required for gas systems, plus another $870 fee. After complaints, they refunded $630, leaving a $1,110 total cost. This case reveals critical inequities: heat pump permits taking three weeks versus one week for gas systems; excessive documentation requirements often requiring professional computer-aided design (CAD) services; workflow disruptions affecting contractor payroll; and prohibitively high fees for basic heat pump installations. These disparities systematically favor fossil fuel systems over clean electric alternatives.[18]

16 Tech Clean California, "Heat Pump Data Download," accessed April 22, 2025, link.
17 City and County of San Francisco, "6331 Building Inspector," accessed April 22, 2025, link.
18 Anonymous contractor interview, Bay Area

Cities often calculate fees to recover the cost required to conduct permitting and inspection work. By simplifying permitting requirements and introducing greater efficiencies in the permitting process, municipalities can reduce fees as less work is required per permit. Instant permitting (eliminating the submission of plans, and issuing permits upon application submission) would greatly speed the process and reduce the workload for staff and contractors.

Heat Pump Installation
Source: Envato Elements

Problem 6: Jurisdictional Variance

Each Bay Area city sets its own requirements for heat pump installations, creating a patchwork of rules and regulations. This variation creates a significant barrier to market entry and workforce expansion. One Bay Area contractor cited inconsistent standards as a major barrier to onboarding new staff, explaining that new contractors must spend significant time learning rules across jurisdictions— time that otherwise could be spent completing installations.

Adding to the confusion, plan check staff within jurisdictions sometimes have different standards for projects than inspection staff. One contractor cited installing a HPWH in a client's attic. The first building inspector required the contractor to install a dam under the heater. After installing the dam, the contractor again requested an inspection. The second inspector told the contractor to remove the dam, and install a vent instead.

This regulatory unpredictability means contractors may not know going into a project what standards they have to meet and what documentation they have to provide to a city's plan check team. In some cases, this has resulted in contractors initially filing a permit application, and then spending weeks, or even months, going back and forth in communication with the city to determine what information city staff need.

Costs, Confusion, and Circumvention

Permitting the minority of appliances

Permitting compliance for heating equipment across the board is extremely low. In 2019, a California Public Utility Commission Report found only one-third of HVAC changeouts pulled permits.[19] A SPUR analysis found that permit compliance across a number of jurisdictions in both the Bay Area and other locations in California rarely reach rates above 50%. In general, most compliance rates for water heaters and HVAC fall below 20%.

TABLE 6
Gas Water Heater Permit Compliance in Bay Area
Source: SPUR analysis

CITY NAME	REPLACEMENT RATE (HIGH END)	REPLACEMENT RATE (LOW END)	PERMITS ISSUED FOR WATER HEATERS	PERMIT COMPLIANCE RATE (HIGH END)	PERMIT COMPLIANCE RATE (LOW END)
Antioch	**3,163**	**2,063**	**150**	**7%**	**5%**
Oakland	**13,126**	**7,462**	**1,124**	**15%**	**9%**
Palo Alto	**2,409**	**1,403**	**416**	**30%**	**17%**
Richmond	**3,004**	**2,084**	**100**	**5%**	**3%**
San Jose	**28,816**	**16,273**	**1,959**	**12%**	**7%**
San Mateo	**5,278**	**3,505**	**159**	**5%**	**3%**

19 California Public Utilities Commission, Final Report: 2014-16 HVAC Permit and Code Compliance Market Assessment (Work Order 6), Volume I – Report (San Francisco: CALMAC, September 22, 2017), link.

TABLE 7
Gas Water Heater Permit Compliance, Other CA Locations
Source: SPUR analysis

LOCATION	REPLACEMENT RATE (HIGH END)	REPLACEMENT RATE (LOW END)	PERMITS ISSUED FOR WATER HEATERS	PERMIT COMPLIANCE RATE (HIGH END)	PERMIT COMPLIANCE RATE (LOW END)
Kern County	**35,546**	**23,602**	**870**	**4%**	**2%**
City of Riverside	**12,532**	**8,321**	**385**	**5%**	**3%**
City of Sacramento	**25,269**	**16,785**	**1911**	**11%**	**8%**

TABLE 8
Gas HVAC Compliance
Source: SPUR analysis

LOCATION	REPLACEMENT RATE (HIGH END)	REPLACEMENT RATE (LOW END)	PERMITS ISSUED FOR WATER HEATERS	PERMIT COMPLIANCE RATE (HIGH END)	PERMIT COMPLIANCE RATE (LOW END)
Kern County	**19,052**	**9,384**	**827**	**9%**	**4%**
City of Riverside	**6,717**	**3,308**	**641**	**19%**	**10%**
City of Sacramento	**13,549**	**6,673**	**3,926**	**59%**	**29%**
San Mateo	**2,829**	**1,394**	**254**	**18%**	**9%**

As building departments, code officials, and state legislators consider fixes to the permitting system for heating equipment, they must contend with the fact that the current system is being bypassed in the majority of installation cases. Put simply, if no one is willing to follow the law, then the law is likely too difficult to follow.

Low compliance should trigger a reassessment of what permitting can realistically achieve. Some goals of permitting and inspections might better be achieved through improved contractor training. For example, a CPUC report found essentially no difference in the energy efficiency of permitted versus unpermitted HVAC systems.[20] Although permits and inspections are still important for ensuring safety, they may not be well suited for ensuring HVAC efficiency.

A key driver of low compliance rates is the emergency nature of most heating replacements. When old appliances fail, homeowners don't have time to wait around for permits that may take days or even weeks to obtain – but current permitting systems rarely acknowledge this practical reality. In these cases, jurisdictions should allow work to proceed on heat pump water heater and

20 Ibid, pg 3.

heat pump HVAC installations while permits are being processed, and then use the inspection to ensure health and safety standards are met.

If cities want contractors to seek permits for heat pumps, reform is necessary – and there's evidence that simplified permitting can lead to higher compliance. In 2016, for example, the City of San José simplified their permitting system for rooftop solar projects and saw a 600% increase in approved permits within the first year of implementation.

Penalizing those who seek help decarbonizing

Because some public incentive programs require permit verification, the burden of inefficient permitting systems falls hardest on those using rebates, loans, or full-service decarbonization programs. This also means taxpayer dollars are spread thinner by inefficient permitting. A report from Rising Sun Center for Opportunity found that public funding for residential decarbonization in the Bay Area has rapidly expanded, and is projected to reach a historic peak of $234 million in 2025.[21] A large portion of this funding is for clean appliances like heat pumps, and is likely to be subject to permit verification. Homeowners installing cheaper gas appliances without rebates will continue to circumvent the permit process.

TABLE 9
Examples of heat pump incentive programs that require permit verification
Source: SPUR analysis

PROGRAM	PERMIT VERIFICATION	PROGRAM FUNDING (2024-2029)[22] [23]	COMMON REBATE AMOUNT AVAILABLE
Equitable Building Darbonization Program	**Work must comply with applicable standards and manufacturers' installation instructions and obtain required permits.[24]**	**$551,000,000 (CA)** **$107,300,000 (Bay Area)**	**NA, variety of investments, full-service programs**
TECH Clean California Home Electrification and Aplliance Rebates (HEEHRA) **TECH Clean California Home Energy Rebates (HOME)**	**Permits are required for all projects. Contractors must provide a permit number for each incentive application. Closing a permit is not required before the incentive is paid out, but checks are performed to ensure permits are closed.[25]**	**HEEHRA:** **-$80,000,000 CA (phase 1)** **-$37,100,000 Bay Area** **TECH HOME:** **$5,600,000 Bay Area**	**$4,000 - $8,000**

21 Rising Sun Center for Opportunity, Residential Decarbonization Study: Industry Analysis (August 13, 2024), link.
22 Ibid.
23 Building Decarbonization Coalition, "California Governor's Budget Proposal Maintains Over $500 Million for Equitable Building Decarbonization," accessed May 6, 2025, link.
24 California Energy Commission, TECH Clean California: 2023 Annual Report (December 15, 2023), link.
25 Frontier Energy, Incentives Overview, accessed April 22, 2025, link.

Silicon Valley Clean Energy (SVCE) - home appliance rebates	**Applicants are required to show their permit application but do not require applicants to show proof of inspection.**	**~$6,000,000**	**HPWH: $2,000-$3,000** **HP HVAC: $2,500 - $3,500**
Peninsula Clean Energy (PCE) home appliance and panel upgrade rebates, and turnkey electrification program	**Applicants must provide photos of new equipment and capped gas line, proof of project costs such as a contractor invoice, and copy of the city permit.**	**$34,900,000**	**$2,500**

The "soft costs" of permit barriers

Heat pump installation expenses fall into two categories: "hard costs" and "soft costs". Hard costs include tangible expenses like manufacturing and equipment installation. Soft costs include legal, permitting, advertising, and logistical barriers that raise the price of delivering and installing equipment, as well as time spent by distributors and contractors securing customers, producing bids, and complying with local rules. Non-competitive markets, limited workforce training, and workforce shortages further drive up soft costs. Soft costs are often studied rigorously in attempts to reduce the cost of critical goods and services, including clean energy appliances. Solar PV is one area where particular attention has been paid to the soft costs, which may account for as much as 64 percent of the cost of systems installed in the US.[26] One study found that cities with less stringent permitting processes reduced solar PV installation costs by 4-6% compared with cities with poor permitting processes. They also found that favorable permitting could account for as much as 24 day reduction in time required to install solar PV (25 percent of total).[27] A more recent study found permitting and inspection solar soft costs can be up to $10,000 for a 10kW system![28]

By comparison, install costs for heat pumps are not well known. A UK study found that "heat pump installed costs are reported inconsistently and often only partially, across differing technology types, building contexts and assessment boundaries – and access to some data sets is restricted to private firms and industry associations.""[29] This data gap makes it hard to determine the degree to which soft costs, such as permitting and local rules, drive up total project costs.

Despite limited research, testimonials from contractors, electrification specialists, public officials, and policymakers are deepening our understanding of cost impacts. One contractor SPUR consulted estimated pass-through permitting costs for heat pump HVAC installations in select Alameda County cities at approximately 7 percent of total project cost, amounting to $2,173 per project (4 percent from permit fees and plan drafting, 3 percent from time and effort).[30]

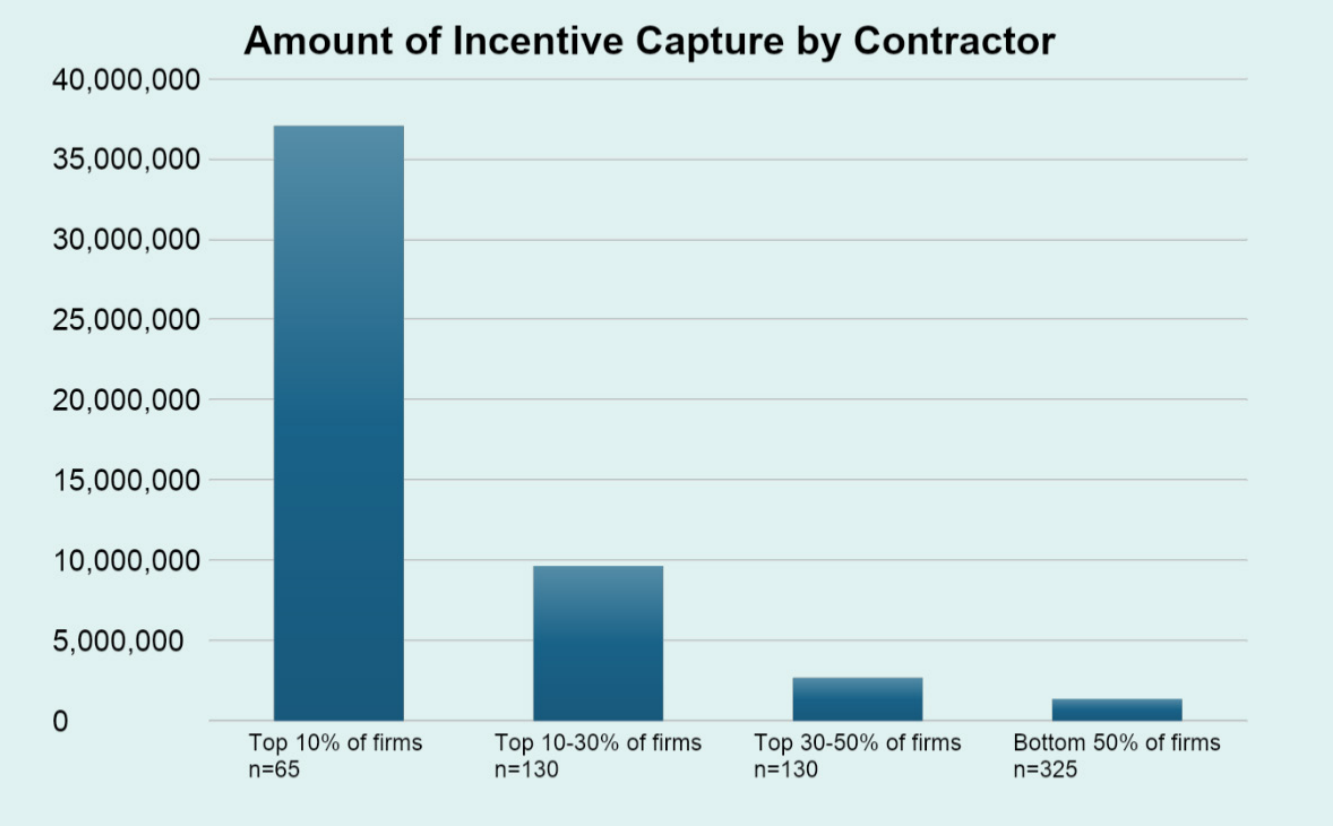
26 DOE/National Renewable Energy Laboratory. "Soft costs now largest piece of solar installation total cost." ScienceDaily. ScienceDaily, 11 December 2013. link.
27 Andrew S. Reames and Joshua P. Newell, The Impact of City-Level Permitting Processes on Residential PV Installation Prices and Development Times (American Solar Energy Society, 2021), link.
28 Forthcoming study from Permit Power.
29 *Reducing Heat Pump Installed Costs: Reviewing Historic Trends and Assessing Future Prospects, Energy* (2024), https://doi.org/10.1016/j.energy.2024.130132.
30 SPUR consultations with Bay Area contractor, anonymous.

Labor intensive permitting will contribute to a constrained labor market

Most of the heat pump permitting problems identified by SPUR involve demands on the time and effort of installers. These sometimes imperfectly translate into pass through costs in the form of increased billable hours. However, a more insidious impact is the strains placed on the wider workforce, both in terms of workers prepared to install equipment, and building department officials trained to permit and install equipment. As regulation, incentives, and building codes increase *demand* for heat pumps, the *supply* of workers knowledgeable about heat pumps may struggle to keep up.

TECH Clean California data indicates a small number of firms are cornering incentives, possibly due to permit verification requirements deterring less sophisticated firms. The top 10 contractors received 38% of heat pump rebates, while the top 10 percent captured 73% of TECH incentives.[31] Without making it easier for a broader base of contractors to access incentives and participate in the heat pump market, competitiveness will remain poor, and sophisticated contracting firms will more easily corner geographic territory and raise prices.

TABLE 10
TECH rebates are captured by a small percentage of participating firms



31 Tech Clean California, "Heat Pump Data Download," accessed May 6, 2025, link.

Why heat pump permitting got so difficult compared with gas appliances

California's building (safety) codes were built around gas appliances in the 1970s and have not been meaningfully updated to reflect modern electrification needs. As a result, outdated, gas-focused rules are applied to heat pumps, which have different safety profiles and don't require the same precautions.

Safety risks from gas water heaters and furnaces have shaped building codes, leaving rules in place that are often misapplied to heat pumps. Gas lines carry highly combustible fuel, so gas appliances in garages require sturdy bollards to prevent cars from dislodging pressurized lines, and earthquake strapping to avoid fires or explosions if toppled. Electric heat pump water heaters pose much lower risks if bumped, toppled, or surrounded by combustible materials.

Gas water heaters must also be elevated above the lowest 16" garage floor to avoid igniting pooled gasoline fumes — a hazard not posed by spark-free, flameless heat pump models. Additionally, gas appliances produce toxic exhaust, sometimes containing lethal carbon monoxide, requiring careful venting, while heat pump water heaters and their outdoor units safely expel clean, dry air.

The shift to electric heat pump heating and water heating is part of a broader "macro safety" movement that improves both global and local safety by reducing combustion exhaust in homes, neighborhoods, and the atmosphere. To accelerate adoption of these safer technologies, we need permit streamlining and other strategies to lower barriers and increase deployment in our communities.

Recommendations

1. The California Legislature should pass permit streamlining and standardization legislation for heat pumps, such as SB 282 (Weiner).

The California Legislature has passed several permit streamlining bills for clean energy appliances, though none yet for heat pumps. State laws mandate automated permitting for solar photovoltaics and home batteries (SB 379, Wiener, 2021),[32] require expedited solar permitting and limit permit denials (AB 2188, Muratsuchi, 2014),[33] and cap solar permit fees (AB 1132, Friedman, 2023).[34] For EV chargers, California requires expedited, health-and-safety-only reviews (AB 1236, Chiu, 2015)[35] and limits jurisdictions to simple, nondiscretionary permits (AB 970, McCarty, 2021).[36] These laws have saved time and reduced soft costs, as seen in cities like San Jose, which offers same-day heat pump permits.[37]

In early 2025, SPUR worked with Building Decarbonization Coalition (BDC) and the Bay Area Air District to co-sponsor the Heat Pump Access Act, SB 282 with Senator Scott Weiner. SB 282 emerged from a growing recognition of permitting barriers, and their time-consuming and cost-driving complexities associated with local permitting, coupled with ambitious clean air rules and state climate targets that are setting the stage for enormous growth in the heat pump market. The bill would do the following:

32 California State Legislature, Senate Bill No. 379, Decarbonization: Building Permits, 2021–2022 Reg. Sess., link.
33 California State Legislature, Assembly Bill No. 2188, Solar Energy Systems: Permits, 2021–2022 Reg. Sess., link.
34 California State Legislature, Assembly Bill No. 1132, Building Electrification: Permitting, 2023–2024 Reg. Sess., link.
35 Governor's Office of Business and Economic Development, EV Charger Permit Streamlining: AB 1236 Fact Sheet, November 2021, link.
36 California Legislature, Assembly Bill No. 970, 2021–2022 Regular Session, link.
37 Inside Climate News, "California Cities Fast-Track Solar Permits to Let the Sun Shine Faster and Cheaper," Inside Climate News, July 29, 2016, link.

TABLE 11
Key provisions in SB 282 (Weiner, 2025)

PROVISION	DESCRIPTION	IMMEDIATE IMPACTS
Instant permits	Requires same day, automated online permitting for heat pumps (already required for solar and EV chargers).	Less time spent on permit applications, eliminate back and forth with permit staff, improve building department efficiency, eliminate wait times for permit.
Standard, simplified state checklists	Directs the State Building Codes and Standards Commission to develop a short Heat Pump HVAC and HPWH checklist, and require cities some portion of the checklist as the application for fastrak permits.[38]	Predictability for contractors and customers across jurisdictions, less time spent on permits, eliminate plan checks and time consuming local requirements.
Limit local standards that go beyond state code	Mandates that cities cannot impose planning and zoning rules that go above and beyond state standards on health and safety, with some exceptions.[39]	Ensure contractors can legally, and affordably site and install heat pumps. Prevent excessive aesthetic, noise, and setback rules from blocking heat pump installations. Eliminate the need for planning documents.
One permit, one inspection	Require local jurisdiction to issue a maximum of one permit, and conduct one inspection, per heat pump installation.	Prevent multiple permit requirements from multiplying project costs and complexities for contractors, and building departments.
Remote and asynchronous Inspections	Require building departments to offer asynchronous inspection options, such as remote inspections or inspections where a contractor does not need to physically present.	Reduce time spent by contractors waiting around for inspections, freeing up labor hours for other installations.
Fee caps	Require cities to charge no more than $350 for HP HVACs, and $250 for HPWHs, unless they transparently demonstrate additional cost recovery needs. Require flat fees.	Reduce costs and cost unpredictability associated with variable permitting fees.

38 While San Francisco's permitting process can be burdensome when multiple permits are required. However, they have a short and simplified instant permit system for heat pump water heaters. See Eric Morrill's guide to the SF permit process: link.

39 California's Solar Rights legislation limits cities from imposing restrictions that "significantly" impact the cost of solar systems. SB 282 would limit cities to a few specific non-state standards, such as a 3ft setback. The state could establish additional standards for cities related to siting, noise, and aesthetics that further refine what the legislature deems and acceptable, and unacceptable, reason for restricting these critical appliances.

State standards should provide clear rules for setbacks and noise offering significant leeway for customers to install heat pump equipment. SPUR recommends requiring a maximum of 3ft in side yards (in SB 282) when applied to heat pumps, and for homes with 3ft between the home and the side property line, set back restrictions should be eliminated for heat pump equipment.

SPUR also recommends the state set minimum upper limits for noise levels cities may impose at 65 dBA or greater for inverter technologies and 60 dBA or greater for non-inverters (based on heat pump nameplate dBA rating). No documentation should be required for equipment with dBA ratings under these limits. For heat pumps that exceed these limits, cities should use simple sound attenuation calculations that reflect the distance from the appliance to 3ft into the neighbors property (or to the neighbors building), and that take into account sound barriers. Sound engineering documentation should never be required. The state should also create a heat pump noise certification that explicitly exempts certified equipment from local noise review.

Finally, heat pumps and other electric appliances can trigger electrical panel upgrades. While SPUR's work shows that panel optimization can greatly reduce this need, streamlined permitting is still needed for both panel replacements and electrical appliances.[40] Like heat pumps, little progress has been made in modernizing permits for panel replacements. SPUR recommends future legislation establish instant, checklist-based permitting for electrical panel replacements.

2. The California Legislature should pass legislation directing the California Building Standards Commission to pilot remote inspection and self-certification programs statewide, with the goal of creating statewide requirements to participate in these alternate permitting and inspection pathways

Remote inspections: For simple appliance installations, inspectors don't always need to be on-site. Since the COVID-19 pandemic, many California cities have adopted remote inspections for building improvements and appliances. Florida now requires them by law for types of building permits,[41] and the ICC has formally endorsed video and phone inspections.[42] Remote inspections offer contractors scheduling flexibility, reduce travel, and free up inspectors' time for more complex projects. The California Legislature should consider requiring cities to offer remote inspections, while cities can experiment with remote inspections through pilot programs, or city ordinances requiring remote inspection options.

Self-certification: SB 282 initially proposed a statewide self-certification program offering a pathway for contractors to become qualified, through training and demonstrated ability, to "certify" that heat pump installations are up to code, in lieu of an inspection. Support for this approach was lacking, possibly due to the paucity of these programs in the US for general contractors, electricians, and plumbers.

However, self-certification is very common in the building industry, with programs in large cities like New York and Chicago for engineers and architects.[43] [44] In Europe, it is common for heat pumps to not require permits at all, or to allow self-certification. Germany, for example, usually does not require permits for heat pumps.[45] In the United Kingdom, you can be certified under a Competent Person Scheme to install a heat pump without needing to request an inspection.[46] Sweden offers a certification that allows for installation of small scale renewable energy appliances, including heat

40 SPUR, Solving the Panel Puzzle: How to Modernize California's Residential Electrical Infrastructure for Electrification, May 2024, link.
41 Accela, "Florida's New Bill Requires Certain Building Permit Applications to Be Processed Electronically and Agencies to Perform Virtual Inspections," Accela Blog, accessed April 22, 2025, link.
42 International Code Council, "Considerations for Virtual and Remote Inspections," Building Safety Journal, accessed May 6, 2025, link.
43 City of Chicago, "Self-Certification Permit Program," City of Chicago, accessed April 22, 2025, link.
44 City of New York, "Professional Certification," NYC Department of Buildings, accessed April 22, 2025, link.
45 "Rechtliche Vorgaben einer Wärmepumpe: Das müssen Sie beachten," Kältebringer, accessed May 5, 2025, link.
46 UK Government, "Next Steps: Getting Started as a Heat Pump Installer," Heat Training Grant for Heat Pumps, accessed May 5, 2025, link.

pumps, without requiring an inspection.[47] SPUR was able to identify at least one self-certification program for HVAC and water heating equipment in the US in Pima Arizona.[48]

California agencies should develop guidance on self-certification policies, and pilot a self-certification program statewide. HEEHRA and other state programs that train and certify contractors could leverage those activities to build a self-certification pathway. Compliance spot checks could be used to ensure code compliance.

Alternate inspection pathways can counterintuitively improve health and safety by creating a new pathway for ensuring code compliance for the vast majority of heating equipment that is installed unpermitted. They also offer a more complete approach to reducing or nearly eliminating the costs and frictions associated with permitting.

3. The California State Licensing Board (CSLB) should develop new state code, guidance, and certification programs to expand the proportion of the workforce that can legally install heat pumps.

California should implement a California version of Oregon's Water Heater Installer Certificate to open the field of simple water heater replacement to workers without full plumbing licenses.

4. The California Buildings Standards Commission should establish a Fuel Switching Code Advisory Committee and work with the International Code Council (ICC) and/or National Fire Protection Association (NFPA) to develop recommendations for a state-wide fuel-switching code.

In 2007, California created a Green Buildings Standards Code Advisory Committee, which led to CALGreen — a statewide code that drove major efficiency gains and helped secure California's place as the nation's most energy-efficient state.[49] A similar process should be used to create a statewide fuel-switching code, as no current code fully covers gas-to-electric home conversions without excessive requirements. The state could use the 2016 SB 32 amendment to form an advisory committee for this purpose, including the ICC and NFPA. A consolidated code would reduce the number of contractors, steps, and inspections needed for basic appliance conversions, making electrification projects faster and more accessible, similar to what has been achieved for solar PV.[50]

5. Cities and counties should pass local ordinances that address planning code, permitting, and inspection frictions for heat pump installers.

Local zoning, planning, and building codes aim to protect public health, ensure uniformity, and address quality of life issues. Permit and inspection processes help enforce these standards. However, many local standards and permitting processes still center on gas equipment. There's a clear need to modernize these frameworks to reflect clean heating technology and align with municipal climate action, resilience, and clean air goals common across California.

Successful permitting must treat contractors as a willing partner. Municipalities must seek a better balance between stringency, and compliance. With permit compliance often less than 10 percent for heating equipment, the scales are currently heavily-weighted toward stringent, inflexible standards and permitting, and not toward mass adoption of inherently safer, more climate-gentle future facing equipment.

Municipalities can balance the scales by passing ordinances that revise zoning and planning standards, and direct building departments to modernize permitting and inspections. If state

47 "Sweden," RES-EU (Renewable Energy Systems Europe), accessed May 5, 2025, link.
48 "Contractors," EZ Permitting, accessed May 5, 2025, link.
49 Subramanian, Sagarika, Weston Berg, Emma Cooper, Michael Waite, Ben Jennings, Andrew Hoffmeister, and Brian Fadie. "2022 STATE ENERGY EFFICIENCY SCORECARD." (2022).43 City of Chicago, "Self-Certification Permit Program," City of Chicago, accessed April 22, 2025, link.
50 "A No-Cost Rooftop Solar Stimulus," SPUR, August 11, 2020, link.

lawmaking provides directions to municipalities on heat pump siting, jurisdictions should follow the law and implement state requirements. If state direction is not forthcoming, cities should move forward on their own on code revisions in line with SPUR's recommendation one, and explore additional efforts relevant in their jurisdiction. SPUR recommends specific steps for local decision-makers aiming to phase out gas-fired systems in favor of electric heat pumps.

- Identify staff with experience in sustainability and clean heating equipment, and have them lead a devoted effort to modernize building department practices for heat pumps with buy-in from key building officials. Involve building staff, attorneys, and council members in making it easy and legal for households to electrify. Silicon Valley Clean Energy (SVCE) "Best Practices Guide for Streamlining Electrification Permitting" offers one roadmap for strengthening building department training and resources for electrification, and recommends identifying "internal champions" to coordinate streamlining efforts.[51]

In Menlo Park, sustainability staff successfully led a process to amend zoning rules for setbacks and off-street parking, significantly expanding the allowable locations for installing heat pump equipment.[52]

- Municipalities should aim to implement permit streamlining measures, either in concert with state mandates (see SPUR's recommendation one), and/or by pro-actively passing a permit streamlining ordinance. This ordinance should, at minimum 1) mandate one multi-trade permit; 2) eliminate plan check requirements when possible and additional forms, like CF1R and CF2R forms, for gas-to-heat pump retrofits; 3) exempt heat pumps from zoning and planning requirements related to aesthetics and noise, and; 4) require building departments to pre-approve permits for standard installations using online on-demand permit portals with simplified checklists.

- Provide inspection options that don't waste contractors' time, including regional inspection coordination, remote inspections, inspections with the building owner, or self-certification programs.

- Eliminate fees when possible: Following major streamlining efforts (standardized checklist permitting, online, automated, same day permitting, remote inspections), the cost of delivering permitting service and guidance should be so minimal that local building departments should eliminate them whenever possible, and otherwise charge ultra low fees.

Some jurisdictions have demonstrated that ultra low fees, or eliminating fees, is possible. The City of Albany, for example, waives all fees when customers replace gas-fired appliances with electric alternatives or install electric vehicle chargers, including fees for any associated panel upgrades.[53] In other cities, contractors reported appreciating non-existent or marginal fees under $100.

51 Silicon Valley Clean Energy, Best Practices Guide for Streamlining Electrification Permitting, February 2020, link.
52 Ori Paz, "Removing Known Barriers: Changing Zoning to Help Electrify Existing Homes," BAYREN Forum, December 7, 2023, link.
53 City of Albany, "FY24-25 Master Fee Schedule," accessed May 5, 2025, https://www.albanyca.gov/files/assets/city/v/2/finance/documents/mfs/fy2425-master-fee-schedule.pdf.

Conclusion

California's future is electric. State and local climate policy, regional zero-emissions appliance rules like those passed in the Bay Area, and a rapidly expanding marketplace for electric appliances will increasingly require municipalities to facilitate – not obstruct –-the transition away from gas equipment in homes. Streamlining and standardizing permitting and inspection of heat pumps will help reduce costs, improve customer experiences, ramp up permit compliance, expand the workforce installing clean heating technology, and ensure electrification can move forward across the Bay Area.

Heat Pump
Source: Adobe Stock

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