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NRDC Comments on Senate Bill 1414: Improving Energy Compliance of Central Air Conditioning and Heat Pump Systems

Additional submitted attachment is included below.

**Comments of the Natural Resources Defense Council (NRDC) on
Senate Bill 1414: Improving Energy Compliance of Central
Air Conditioning and Heat Pump Systems**

Docket Number 2017-EBP-01

August 20, 2018

Submitted by: Lara Ettenson

I. Introduction and Summary

The Natural Resources Defense Council (NRDC) appreciates the opportunity to offer these comments to inform the forthcoming draft report on improving compliance of central air conditioners and heat pump systems. Our recommendations below include central heating systems since similar compliance and installation issues exist for that technology as well as for air conditioners. NRDC is a non-profit membership organization with more than 95,000 California members who have an interest in receiving affordable energy services while reducing the environmental impact of California's energy consumption.

Heating ventilation and air conditioning (HVAC) system installations are complex with multiple touchpoints and have high potential to help meet the state's aggressive energy efficiency and climate goals. By not addressing the quality installation problems, we risk falling short of our targets. As noted throughout the proceeding, improper installation can result in "a 20 to 30 percent increase in the peak energy needed."¹ Saving energy from this gap would reduce California's carbon emissions by 5 MMT annually.² This is the equivalent to avoiding the pollution from 1.2 million gasoline cars.³

While compliance is the foundation of the Senate Bill 1414 (SB 1414) legislation and therefore the focus of the forthcoming report, we note that quality installation is the ultimate goal that would result from improving compliance. With that framing, we recommend that the CEC (1) Focus the objective on increasing quality installation, using compliance as one mechanism to address the lost savings opportunities in addition to workforce training, incentives, fines, among other strategies to ensure a comprehensive plan to address this persistent challenge, (2) Include central heating systems in the forthcoming report to maximize savings impacts; and (3) Provide a

¹ The HVAC Convener Report, "Appendix to the January 2008 DRAFT of the "California Long Term Energy Efficiency Strategic Plan" - Recommended Strategic Plan to Transform the Existing HVAC Industry and Achieve Additional Peak Savings, Sustainable Profitability, and Increased Customer Comfort," January 3, 2008, p.6 (in the PDF). http://www.performancealliance.org/Portals/4/Documents/convener_hvac_report_010308-1.pdf.

² NRDC estimate based on CARB 2018 inventory and RASS 2010 data on residential gas use.

³ EPA, "Greenhouse Gas Equivalencies Calculator," accessed August 20, 2018. <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>.

range of solutions (e.g., training, incentives, citations, etc.) for all touchpoints in the system (e.g., from manufacturer to consumer).

II. Discussion

NRDC's mission is to combat climate change and air pollution, and to do so in a manner that ensures equitable access to clean and affordable energy. With that lens, we respectfully offer these comments on methods to address issues with permit compliance as well as general strategies to increase quality installations to ensure customers realize the anticipated energy savings.

A. Focus the objective on increasing quality installations, using compliance as one mechanism to address the lost savings opportunities.

While we understand that the legislation requires the CEC to provide recommended solutions to the compliance challenges of air conditioning and heat pump systems, we recommend that the CEC frame the report around the objective of what compliance is aiming to do – increase energy savings through improved installation. Such additional aspects include (but are not limited to) workforce standards and training, incentives or requirements for manufacturers, retailers, contractors, and customers; quality installation checks; fines for non-compliance; consumer education; and leveraging innovative technologies like continuous commissioning and meter data analysis.

Since no one strategy will solve this complex problem, presenting the solution as a holistic approach would provide multiple ways to reach all players in the market thereby providing a higher opportunity for success than by focusing on one individual approach. Similar to the Assembly Bill 758 Energy Action Plan,⁴ this would require identifying who should be responsible for the particular strategy and what resources they would need to achieve the goal.

B. Include central heating systems in the forthcoming report to maximize savings impacts.

We strongly recommend that any relevant solution presented in the forthcoming report be applicable to heating as well. Doing so will leverage the current process for air conditioners and heat pumps, resulting in an even broader range of opportunities to capture savings in the state. Since most of the installation issues found with air conditioning and heat pumps also apply to central gas furnaces for space heating, and there are many of the same actors dealing with both

⁴ CEC, "Comprehensive Energy Efficiency Program for Existing Buildings," <http://www.energy.ca.gov/ab758/>

technologies, this recommendation is feasible within the current CEC process. For example, the following list of issues apply to both centralized air conditioners as well as heating systems:

1. Leaky and undersized ducts result in energy leaving the house resulting in higher costs and energy use to ensure comfortable temperatures in seasonal weather as well as safe temperatures when weather conditions are extreme, like heat waves and cold snaps. This impacts lower income homes even more who cannot afford to run their systems as much as would be needed to meet their comfort and health needs and their energy bills already represent a disproportionate share of their disposable income without this added challenge
2. Blowing air through leaky ducts also depressurizes the building, pulling in unconditioned, and potentially unhealthy make-up air from musty crawl spaces, attics and garages, causing additional heat losses, and health issues like allergies to occupants.
3. Oversized air conditioners and furnaces are less efficient, potentially costlier than are needed in the homes, and exacerbate leakage when ducts are not sized to match.
4. Heating and cooling energy waste also impacts disadvantaged communities' pocketbooks the hardest because low-income families tend to live in homes with less insulation and leakier ducts and energy bills represent a disproportionate share of their disposable income.
5. Central heating and cooling are the #1 and #3 energy uses respectively in California homes. And their energy consumption impacts the climate more than other equipment for two reasons:
 - a. First, air conditioners work the hardest on hot summer afternoons and evenings, at times of peak electricity demand, when grid operators need to fire up the dirtiest power plants to keep our lights on and our buildings from overheating.
 - b. Second, central gas furnaces suffer from the same installation quality, and low performance issues, as central air conditioners. Further, while California's electricity is becoming more renewable, natural gas is not, and burning gas in furnaces remains a significant contributor to the state's carbon emissions.
 - c. There is new evidence that leaks of methane from natural gas production and distribution are higher than previously thought and significantly increase the climate impacts of the use of natural gas.⁵

The compliance plan required by SB 1414 for central air conditioning and heat pumps can be leveraged to cut energy waste from gas furnaces as well, saving even more energy and pollution for the same investment in commission staff and budget while increasing the health of Californians and lowering bills due to greater energy savings.

⁵ Alvarez R. et al., "Assessment of methane emissions from the U.S. oil and gas supply chain", July 2018, <https://www.edf.org/media/new-study-finds-us-oil-and-gas-methane-emissions-are-60-percent-higher-epa-reports-0>

C. Provide a range of solutions (e.g., training, incentives, citations, etc.) for all touchpoints in the system (e.g., from manufacturer to consumer).

As presented throughout comments and in the numerous workshops, there are many interventions the CEC could propose that would impact different market players along the supply chain. Many commenters raised concern that a particular requirement will unduly impact their ability to economically work in California or that many of the stakeholder proposals are outside of their current scope of work. While we understand these concerns, the solution to this complex challenge will need to be addressed by implementing numerous recommendations along the entire system, requiring all actors to modify their behavior (including customers).

In addition, how such an improvement plan is implemented (e.g., what order are the various recommendations executed and who is responsible for overseeing which part) is also a critical component to flesh out in the forthcoming report to ease the transition to a new approach while pushing forward solutions in a timely manner to address these critical concerns.

When making such a determination in the forthcoming report, we recommend that in addition to the traditional metrics of feasibility and cost, the CEC should weigh the ability of market actors to respond (e.g., some recommendations require one centralized effort versus others that require dozens of local building departments to comply). In addition, the final report should highlight the resources needed (e.g., training for building staff to learn new electronic compliance technology) or if any additional authority is required for implementation.

The following summarizes NRDC's position on various proposals presented throughout the proceeding.

- Streamlining the permit process: One of the challenges with compliance is how much easier (and cheaper) it is to conduct HVAC work without a permit. According to a study by DNV-GL, the process of replacing an HVAC without a permit requires approximately 6 steps.⁶ If a customer were to instead conduct work with a permit, it would be twice as many steps. If the customer fails the HERs check along the permit compliance path, it would ultimately be more than 3x the steps a customer would have had to take under the non-compliance scenario. Therefore, while we do not have a specific recommendation for how to streamline, **NRDC fully supports efforts to narrow the number of steps for the compliance path and to address any related cost differential that may also be a barrier.**
- Online permitting system: One of the challenges with pulling a permit is the time contractors must spend getting the permit. This also increases costs and with customers unaware of the state requirements and/or processes, there is little

⁶ DNV-GL "2014-16 HVAC Permit & Code Compliance Market Assessment: Work Order 6," August 18, 2017, p.7

motivation for contractors to pull a permit when little to no consequences are likely to result. **NRDC strongly supports establishing an online statewide permitting system to allow the flexibility of remote applications and payment options and urges the CEC to also consider potential solutions for local building departments who might need support implementing such a system.**

- Mobile technologies for inspectors: With an online permitting system, it will be important to integrate field data to ensure building departments are able to review the full range of information associated with the permit process. To do so effectively and efficiently, building departments should have the most appropriate mobile technology to help them check and close permits, with the information uploading directly to the online system. These systems can also be implemented regardless of adoption of an online permitting system. Therefore, **NRDC supports upgrading building department infrastructure to utilize web and mobile tools to carry out permit compliance efforts.**
- Building department trainings: With changing codes each cycle as well as potential for new technologies to help implement code compliance, building department staff will need to be continuously trained to effectively carry out their duties. The California energy efficiency program administrators under CPUC oversight currently offer a variety of trainings for staff, which the CEC could leverage if they wanted to expand its reach. Requiring training while also providing benefits of such training, like continuing education credits, could increase the attendance and minimize the burden of taking time off work to be trained. **NRDC supports continuing to have program administrators provide training programs as well as potential future efforts by the CEC to expand the reach of these trainings beyond the territories covered by CPUC jurisdiction.**
- Minimum training requirements for installation: Any forthcoming determination on the responsible contractor policy pursuant to Senate Bill 350 should include a component that addresses minimum training to install systems. While this does not address permit compliance directly, it does address quality installation, which is a primary goal of permit compliance. **NRDC supports establishing minimum training requirements with various compliance pathways to ensure all workers that are installing systems have the requisite skills.**
- HVAC tracking system: Knowing where HVAC systems are being installed would enable building departments (and/or a centralized agency) to track and enforce systems that were installed without a permit process. While the development of such a tool would need to address situations where customers could buy their system on eBay or Amazon, a tracking system is a primary way to assess where the systems are delivered, which contractors purchase the systems, and ultimately where they are installed. However, given the need for competing resources to implement multiple options, **NRDC supports this option as an enforcement opportunity but urges the commission to weigh the various options, costs, and implementation feasibility when determining in which order the various recommendations should be implemented.**

NRDC also supports further exploring a host of other options that were raised throughout the proceeding including, but are not limited to:

- Establishing a requirement in partnership with the real estate community to implement a process similar to that in Davis, California.⁷
- Reviewing and updating the HERs process to ensure it is affordable, timely, and effective.
- Setting up a verification process for all HVAC program administrator programs where high compliance will reward implementers with less frequent reviews.
- Setting incentives or requirements tied to warranties or other components attached to the products themselves (e.g., a customer will only receive the warranty after providing proof of permit compliance or a customer will receive an extended warranty when the customer submits proof of compliance).
- Exploring expanded “stings” to increase enforcement and shift the assumption that non-compliance is a low-risk choice.
- Launching a customer education campaign (in conjunction with or through Energy Upgrade California) to ensure all customers are aware of the requirements, the benefits of properly installed systems, and the potential risks for non-compliance.
- Exploring how to leverage the Contractors State Licensing Board (CSLB) authority to increase training requirements on HVAC license holders, require licensees to periodically report their HVAC installations to CSLB– which would require a data collection system and staff to analyze the data, and/or establish a statewide quality audit program to randomly select HVAC license holders to review the permit compliance and quality installation of their systems.

III. Conclusion

Thank you for the opportunity to comment on how best to improve the energy compliance of central air conditioning (and heating) as well as heat pump systems. We look forward to working with the Commission staff and stakeholders to outline and help implement a feasible and aggressive strategy to address the issue of compliance and quality installations.

⁷ City of Davis, “Resale Program,” <https://cityofdavis.org/city-hall/community-development-and-sustainability/building/resale-program>