

City of Piedmont
COUNCIL AGENDA REPORT

DATE: May 2, 2022

TO: Mayor and Council

FROM: Sara Lillevand, City Administrator

SUBJECT: Presentation Regarding Implementation of Ordinances 750 N.S. (“Reach Codes”) and 751 N.S. (“Home Energy Assessment Policy”) and an Update on the 2022 Energy Code

RECOMMENDATION

Receive an informational update on the implementation of Ordinances 750 N.S. (“Reach Codes”) and 751 N.S. (“Home Energy Assessment Policy”). Receive a presentation on the 2022 Energy Code and City staff’s initial considerations for Piedmont’s compliance with the new Code.

EXECUTIVE SUMMARY

On February 1, 2021, the Council adopted Ordinances 750 N.S. (“Reach Codes”) and 751 N.S. (“Home Energy Assessment Policy”). The goal of these Ordinances is to reduce natural gas use in residential buildings so that the Piedmont community can achieve its greenhouse gas emissions reduction targets. Ordinance 750 N.S. went into effect on June 1, 2021, and Ordinance 751 N.S. became effective on March 3, 2021. This report provides information on the implementation progress of Ordinances 750 N.S. and 751 N.S. It also provides an overview of the 2022 Building Energy Efficiency Standards (“Energy Code”) and considerations for compliance with the new code set to take effect on January 1, 2023. Upon adoption of the 2022 Energy Code, the City will also need to adopt any local amendments to the Code, including readoption of the Reach Codes.

BACKGROUND

The California Code of Regulations, Title 24, Part 6 – the Building Energy Efficiency Standards (“Energy Code”) – set statewide energy efficiency requirements for new construction of, and additions and alterations to, residential and nonresidential buildings. The California Energy Commission (CEC) updates the standards every three years to cost-effectively increase the energy efficiency and lower the carbon footprint of buildings. At the February 1, 2021 City Council meeting, the Council adopted Ordinance 750 N.S., amending the 2019 Building Energy Efficiency Standards. Concurrently, the Council adopted Ordinance 751 N.S., which modified City Code Division 8.08 to require each person who sells or transfers an interest in real property in Piedmont to provide a Home Energy Score or a Home Energy Audit in the past five years to potential buyers. Together, Ordinances 750 N.S. and 751 N.S. help residential buildings achieve greater energy efficiency and inform residents of important information regarding their property’s energy use and associated costs with that energy use. The Ordinances also help the Piedmont community meet its

Climate Action Plan (CAP) 2.0 emissions reduction and climate adaptation goals. Natural gas use in residential buildings is one of the biggest obstacles to achieving the City's CAP 2.0 goals – it consistently comprises about half of Piedmont's in-territory emissions.

In August 2021, the CEC adopted the 2022 Building Energy Efficiency Standards for newly constructed and renovated buildings, with the goal to produce benefits to support the state's public health, climate, and clean energy goals. The 2022 Energy Code update revises energy efficiency standards for additions and alterations to existing buildings and newly constructed buildings. Regarding new construction of single-family residential buildings, the most significant changes center around changing to a single fuel baseline, with heat pump requirements for either water heating or space heating. Other notable changes pertain to insulation, ventilation, electric readiness, and electrical infrastructure. The 2022 Energy Code goes into effect on January 1, 2023. When the CEC updates the 2022 Energy Code, all cities and counties will need to adopt the new Code and any local amendments to the Code. Given Reach Codes are local amendments, the City will need to readopt the Reach Codes to be compliant with the new Energy Code. Best practice is to adopt the new Energy Code and local amendments to the Code simultaneously. The benefits of this approach include having the Reach Code in effect for the longest duration possible under the Code (i.e., the entire three years between Code updates) and enabling an efficient administrative transition for City staff and building permit applicants.

DISCUSSION

Evaluation of Ordinance 750 N.S. (Reach Codes)

In preparation for the adoption of the 2022 Energy Code, City staff are conducting ongoing monitoring and evaluation of the Reach Codes enacted in 2021. The evaluation process has entailed collecting quantitative and qualitative data through an online survey with building permit applicants, conducting in-person interviews with City staff involved in the Reach Code intake and permitting process, and reviewing building permit applications which had Reach Codes applied to them from the beginning of June 2021 to the end of January 2022. In reviewing these building permit applications, staff evaluated projects with a job value above \$25,000, in addition to projects with scopes including kitchen renovations, laundry room renovations, accessory dwelling units (ADUs), and the additions of a second story or the expansion of 30% or greater roof area.

City staff identified 113 projects which Reach Codes applied to during this time period, as seen in Table 1. Sixty-five percent of the projects had job values over \$25,000, while 35% had job values over \$100,000. Of these projects, 44 included kitchen renovations and 17 included laundry room renovations. Thirteen projects involved building a new detached ADU, while one project included a second story addition or 30% expansion of the roof area.

Table 1. Reach Code Related Building Projects from June 1, 2021 to January 31, 2022

Total Reach Code Applicable Projects	\$25,000 Renovation	\$100,000 Renovation	Kitchen Renovation	Laundry Room Renovation	Accessory Dwelling Unit	Second Story Addition, 30% Roof Increase
113	73	40	44	17	13	1

When evaluating the list of energy efficiency insulation or electrification upgrades required for renovations with a job value exceeding \$25,000, the top upgrades selected were the installation of LED lighting fixtures and the installation of a water heating package (includes the installation of low flow water fixtures and R-3 insulation on all accessible hot water piping). Thirteen projects are categorized in the envelope and duct package (i.e., parts of a building that function as a barrier to the outside): seven projects included the installation of R-38 attic insulation, and six projects included the installation of R-19 insulation for raised floor assemblies. Focusing on electric heat pumps, nine projects included the installation of heat pump heating and cooling systems (i.e., HVAC systems), and six projects included the installation of a heat pump water heater. While numerous building permits were issued for the installation of solar photovoltaic (PV) systems, just one project installed a PV system because of the Reach Code. Table 2 displays the associated greenhouse gas (GHG) reduction assumptions for the total number of projects per energy efficient measure.

Table 2. Selected Energy Efficient Measures and Associated GHG Reductions from Reach Code Related Building Projects from June 1, 2021 to January 31, 2022

	LED Lighting	R-3 Hot Water Pipe Insulation and Low Flow Fixtures (Water Heating Package)	R-19 Raised Floor Insulation, R-38 Attic Insulation, Air Sealing, Duct Sealing (Envelope & Duct Package)	Heat Pump Heating and Cooling	Heat Pump Water Heater	Photo-voltaic solar system
Total Number of Projects	42	28	13	9	6	1
Total Projects GHG Reduction Assumptions*	n/a	2.8 MT CO ₂ e	6.8 MT CO ₂ e	4.9 MT CO ₂ e	3.5 MT CO ₂ e	0.1 MT CO ₂ e

*Reductions for the Water Heating Package and Envelope and Duct package are based off gas savings (therms) for pre-1978 single-family vintages according to Single Family Efficiency Upgrade Cost-effectiveness Results from a February 6, 2020 study prepared by Frontier Energy, Inc. and Misti Brusteri & Associates, LLC, funded by California Utility ratepayers, and submitted to the California Energy Commission – “2019 Cost-Effectiveness Study: Existing Low-Rise Residential Building Efficiency Upgrade”. Reductions for Heat Pump Heating and Cooling, Heat Pump Water Heater, and Photovoltaic Solar System based off electricity (kWh) or gas savings (therms) for pre-1978 single-family vintages according to Single Family Efficiency Upgrade Cost-effectiveness Results from an August 27, 2021 study prepared by Frontier Energy, Inc. and Misti Brusteri & Associates, LLC, funded by California Utility ratepayers, and submitted to the California Energy Commission – “2019 Cost-Effectiveness Study: Existing Low-Rise Residential Building Efficiency Upgrade”. PG&E’s Emission Factor assumption is 0.00531 Metric tons CO₂/therm.

Since Ordinance 750 N.S. went into effect, several areas arose in which City staff found that the existing Reach Codes may be unclear and may benefit from further specification to ensure the intent of the local code amendments are being met. These include:

- Clarifying whether natural gas or propane plumbing should be allowed to be installed for exterior recreational features and amenities (e.g., outdoor fireplace, heat lamp) at a newly constructed low-rise residential building or new detached ADU that is required to be all-electric and would otherwise have no working gas service;
- Clarifying that a project proposing a new ADU or Junior ADU (JADU) fixated to or located within an existing detached accessory structure (i.e., garage, carport) must be built all-electric;
- Specifying that a kitchen or laundry room renovation project is required to not only include electrical outlets for future appliance services, but also include an energy efficiency insulation or electrification improvement; and
- Specifying that low flow water fixtures selected as energy efficiency improvement are required to be installed in all areas of the low-rise residential building not just the area of renovation.

2022 Energy Code and Future Considerations

The 2022 Energy Code revises energy efficiency standards for newly constructed buildings, as well as additions and alterations to existing buildings. The Code builds on California’s technology innovations, encouraging inclusion of market-ready electric products in new construction, such as heat pumps for climate control and water heating. The Code also requires all new homes to be electric-ready. These updates and improvements are crucial steps in the state’s progress toward 100% clean electricity and carbon neutrality by 2045, or earlier.

In light of the 2022 Energy Code and the associated updated cost-effectiveness studies, the City has the opportunity to update its Reach Codes to meet the new requirements and continue being a statewide leader in existing building electrification efforts. Preliminary ideas from staff include the development of Reach Codes for new high-rise multifamily buildings (four stories or more) and for new non-residential buildings and non-residential alterations, which would apply to offices, stand-alone retail shops, and restaurants. Specific to existing low-rise residential buildings, heat pumps for both HVAC and water heating at time of equipment replacement/burnout in combination with a PV system has been found to be cost-effective.¹ Additional measures identified

¹Based on Customer-On Bill benefits identified in the Single Family Efficiency Upgrade Cost-effectiveness Results from an August 27, 2021 study prepared by Frontier Energy, Inc. and Misti Brusteri & Associates, LLC, funded by California Utility ratepayers, and submitted to the California Energy Commission – “2019 Cost-Effectiveness Study: Existing Low-Rise Residential Building Efficiency Upgrade”.

as cost-effective for existing low-rise residential buildings that are not already included in Ordinance 750 N.S. include: exterior photosensors for light fixtures, PV and electric-ready pre-wire measures, and combination PV and battery systems.

Accordingly, City staff's initial ideas for the next iteration of the existing low-rise residential building Reach Codes include: updating the existing energy efficiency improvements list with the latest measures found to be cost-effective; updating the stated project value thresholds for renovation projects (set at \$25,000 and \$100,000) to reflect current cost trends for specific construction trade labor and materials reported by the California Construction Cost index (published by the California Department of General Services); adding a new requirement to clarify that the replacement of a fuel gas furnace must be with a high-efficiency furnace (90% AFUE or higher), an electric heat pump, or with other high efficiency electric systems per approval of the Building Official; and similarly, adding a new requirement to clarify that the replacement of a fuel gas water heater must be with a high-efficiency water heater, a heat pump water heater, or with other high efficiency electric water heating system per approval of the Building Official.

In addition to amendments to the 2022 Energy Code, staff is exploring potential amendments to the requirements for electric vehicle (EV) charging equipment in Part 11 (California Green Building Standards Code, aka CALGreen) of the California Building Code. This could entail amending City Code Chapter 8 Section R309.8 to require Level-2 EV Ready² charging infrastructure for both newly constructed one- and two-family dwellings and townhouses and existing one- and two-family dwellings and townhouses that submitted a building permit application for a garage renovation with a project value of \$50,000 or greater.

Evaluation of Ordinance 751 N.S. (Home Energy Assessment Policy)

Unlike Ordinance 750 N.S., Ordinance 751 N.S. does not require re-adoption by the City Council to remain effective. Nonetheless, components of Ordinance 751 N.S. are applicable to requirements in Ordinance 750 N.S. (i.e., Section 3). Between the period of March 3, 2021 (the effective date of Ordinance 751 N.S.) and January 31, 2022, the City has received 42 Home Energy Score Reports; no Home Energy Audit Reports have been received. Based on BayREN records, 152 Home Energy Scores were reported in Piedmont in 2021 and 2022. Thirty-nine of the 152 Home Energy Scores applied for and received BayREN's \$200 Home Energy Score rebate.

The average score of the Home Energy Scores received by both BayREN and the City is 3. The Home Energy Score is ranked on a scale of 1-10. A higher score indicates the home has excellent energy performance, while a lower score indicates the home needs extensive energy improvements. The average home in the Bay Area receives a score of 5. Of the 42 Home Energy Score Reports received by the City: the average total estimated energy costs per year is \$2,574; the average size of the residence is 2,958 ft²; and the average year the building was built is 1935. Common recommended energy improvements included in the Home Energy Score Reports include replacing a natural gas range/cooktop with an electric range/cooktop, replacement of a gas water heater with a heat pump water heater, upgrading attic insulation up to a minimum of R-44,

² Level 2 EV Ready Circuit is defined as a parking space served by a complete electric circuit with 208/240 volt, 40-ampere capacity including electrical panel capacity, overprotection device, a minimum 1" diameter raceway that may include multiple circuits as allowed by the California Electrical Code, wiring, and either a) a receptacle labeled "Electric Vehicle Outlet" with at least a ½" font adjacent to the parking space, or b) electric vehicle supply equipment (EVSE) with a minimum output of 30 amperes.

upgrading wall insulation up to a minimum of R-13, and sealing and insulating ducts up to a minimum of R-8.

CONCLUSION AND NEXT STEPS

While evaluating the current Reach Code and Home Energy Assessment Policy, it is evident additional policy options will need to be analyzed to scale up Piedmont's electrification efforts to reduce carbon emissions. This may include requirements for upgrades of appliances at time of equipment replacement, upgrades at time of major renovation, and building performance standards. At a higher level, the City should consider developing an existing building electrification strategy to encapsulate said policy options and delineate a detailed, actionable plan for transitioning Piedmont towards a fossil fuel-free future. Additionally, as identified through stakeholder engagement prior to and following Reach Code adoption, the costs of electrification upgrades is a main concern from residents. Subsequently, the City could consider reducing permit fees for electrification related building permit expenses and establishing an electrification rebate fund for appliance upgrades, specifically targeted at lower-income residents, to help alleviate the cost burden of electrification.

With the Reach Codes requiring re-adoption by the City Council prior to January 1, 2023 in order to comply with the 2022 Energy Code, staff have begun stakeholder engagement to inform the development of the draft next set of codes. Most recently, this has included an in-person Reach Code Community Forum held on April 20 and the development of an online reach code community survey available to all those who live and work in Piedmont. The survey is currently open for participation and will close on May 20th. A link to the survey can be found here (<https://docs.google.com/forms/d/e/1FAIpQLSfqEj2z7vQnI0wOKsuf2WYyRJE2mRjd1OckRcMueq8O9hy7cw/viewform>). Additional public processes and subsequent revisions to the draft Ordinance will follow in the summer and fall. Staff plan to introduce a first reading of the Reach Code Ordinance to the Council in the fall.

Supplemental and Referenced Documents

Ordinance 750 N.S. is available at:

<https://www.piedmont.ca.gov/common/pages/DisplayFile.aspx?itemId=17426428>

Ordinance 751 N.S. is available at:

<https://www.piedmont.ca.gov/common/pages/DisplayFile.aspx?itemId=17426430>

City of Piedmont Climate Action Plan 2.0 is available at:

https://www.piedmont.ca.gov/services_departments/planning_building/general_plan_other_policy_documents/climate_action_plan

Chapter 8 of the Piedmont City Code is available at:

https://p1cdn4static.civiclive.com/UserFiles/Servers/Server_13659739/File/Government/City%20Charter%20&%20Code/Chapter%208.pdf?v=gLGONztrb

2022 Building Energy Efficiency Standards information is available at:

<https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency>

By: Alyssa Dykman, Sustainability Program Manager