Date: November 12, 2024

Honorable Mayor and Council Members:

Author and title: Erin Brewster, Sustainability Program Manager

Title: **Building energy and EV charging reach code exploration summary and recommendation to further research heat pump air conditioning incentives, requirements, and/or contractor education programs**

Jen Callaway, Town Manager

Recommended Action:

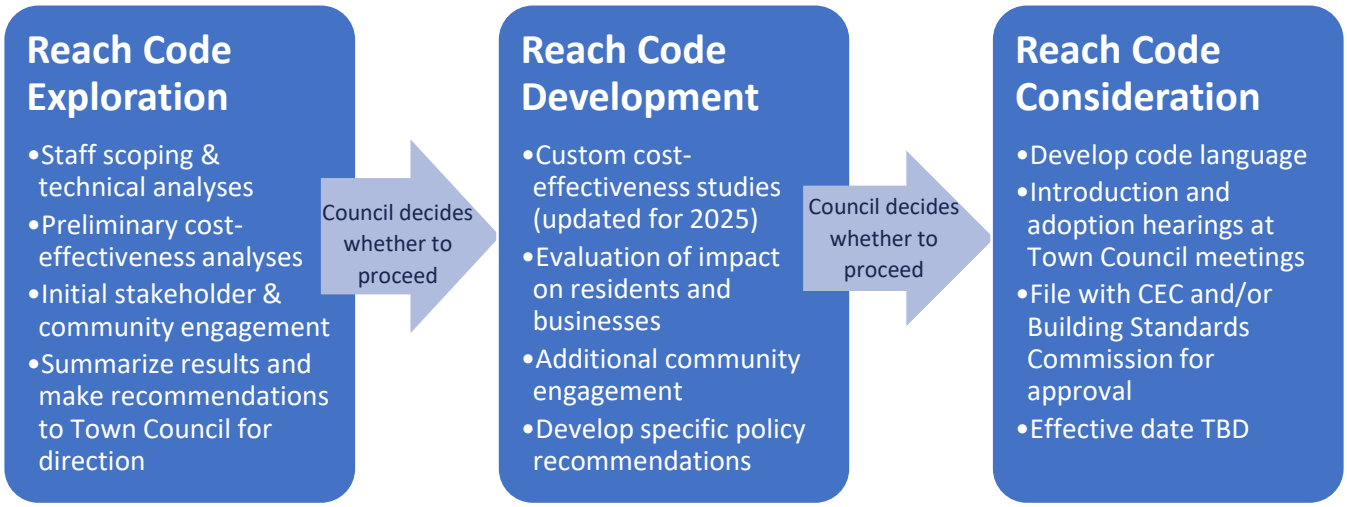
(1) Receive a summary of the analysis, stakeholder committee engagement, and community feedback processes to explore options for building energy and electric vehicle reach codes.
(2) Direct staff not to pursue development of a building energy or EV charging reach code for new construction.
(3) Direct staff to engage a consultant to (a) develop a residential heat pump air conditioning incentive program, (b) analyze potential policy options for a heat pump air conditioning requirement for single-family homes in Truckee and present recommendations to the Town Council for consideration, and (c) integrate heat pump air conditioning training into contractor education programs.

Discussion: The Town of Truckee has committed to reducing its greenhouse gas (GHG) emissions to 80% below 2008 levels by 2040. As of the 2016 GHG inventory, community-wide emissions had decreased by 33% compared to 2008 levels. Building energy use was the largest share of community-wide GHG emissions in 2016 and is expected to continue to comprise a significant share of Truckee's emissions over the next few decades. The Climate Action Plan (CAP) Element in the Town's adopted 2040 General Plan update outlines a strategy to decarbonize existing residential and commercial buildings and minimize additional emissions from new construction. The CAP identifies 9 policies and 16 actions to support energy efficiency in new and existing buildings and increase the use of renewable energy.

One of the actions included in the CAP is consideration of a "reach code." Reach codes are local energy code amendments that "reach" beyond the minimum building energy standards set by the State of California. The intent of these local amendments is to support statewide and local climate action goals by promoting energy efficiency and renewable energy. Reach codes must be (1) stricter than the statewide code, (2) cost-effective, meaning the cost savings from reduced energy use must be enough to offset any additional upfront costs within a reasonable period of time, and (3) approved by the California Energy Commission (CEC). In addition to reach codes, there are other local amendments to the building code that jurisdictions can adopt to promote building and vehicle electrification, such as prewiring for future electrification or requiring installation of electric vehicle charging infrastructure. Any local amendment to the Building Standards Code (Title 24) must be re-adopted and re-approved by state agencies each time Title 24 is updated every three years. Across California, at least 38 jurisdictions have adopted reach codes to support their GHG emissions reduction goals. For purposes of this report, staff may use the term "reach code" to refer to any local amendment to the building code that supports GHG emissions reduction, even if it is not an amendment to the Energy Code.

On January 25, 2022, the Town Council directed staff to issue a request for proposals (RFP) for a reach code consultant to facilitate the reach code exploration process and convene a community stakeholder committee. Staff issued an RFP and selected Integrated Design 360, LLC (ID360), executing an initial contract in April 2022. The scope of work for this contract included an analysis of policy options, facilitation of stakeholder and community meetings, summarizing stakeholder feedback, and performing a supplemental cost-benefit and economic impact analysis of reach code options. This contract was amended in July 2022 and January 2023 to add funding for additional stakeholder and community meetings, and to expand the scope of the cost-effectiveness studies. The expanded cost-effectiveness scope allowed for local Truckee weather and utility rate data to be integrated into the analysis to better reflect local conditions. The contract with ID360 ended in July 2024.

The Town's evaluation of reach codes has three potential phases, with the Town Council deciding at each point whether to proceed to the next phase. The Town is currently finishing the "Reach Code Exploration" phase, which included engaging with the Stakeholder Committee and broader community to get feedback on the high-level types of building code amendments that the Town could investigate further and identify key community interests and concerns about building decarbonization options. This phase is primarily intended to determine the most appropriate policy pathways for Truckee and narrow down the potential options under consideration for further research. Development of specific policy recommendations requires further investigation and would occur in the next phase, pending Town Council direction.



The intent of this report is to provide a summary of the Reach Code Exploration process and present recommendations to the Town Council on whether to proceed with a Reach Code Development phase for any of the types of building code amendments considered. Should the Council recommend moving forward with a Reach Code Development phase, staff will conduct more detailed research and cost analysis to develop recommendations for specific policies for Council consideration, including details such as covered project and building types, exemptions, alternative compliance pathways, and implementation timelines for any recommended policy.

There are a number of other potential building decarbonization strategies for both new and existing buildings that do not fall into the category of building code amendments and were not under evaluation as part of the Reach Code Exploration process. Some additional new construction strategies were included in the CAP and can be considered by staff and the Town Council for implementation in future workplans. Other existing building strategies, including incentives, direct install programs, and other types of ordinances are being evaluated by Town staff as part of development of the Existing Building Decarbonization Roadmap. Once staff has direction from the Town Council on whether to proceed with further consideration of reach codes, a draft Roadmap will be finalized for presentation to Council in early 2025.

Reach Code Exploration Process

The reach code exploration process began with ID360 conducting a technical analysis of the Town's permit data to determine the most appropriate areas of focus for Truckee. A Stakeholder Committee was convened beginning in spring 2022 to provide feedback to the Town and ID360 throughout the reach code consideration process. The Stakeholder Committee included local experts in building decarbonization, staff from local utilities, representatives of the Contractors Association of Truckee Tahoe, and two Councilmembers:

Table 1. Reach Code Stakeholder Committee Members

Name	Affiliation
Anna Klovstad	Town of Truckee Councilmember
Jan Zabriskie	Town of Truckee Councilmember
Steven Keates	Truckee Donner Public Utility District
Breanna Kelly	Liberty Utilities
Jennifer Guenther	Liberty Utilities
Matthew Helmers	Southwest Gas
Alondra Delgadillo	Sierra Community House
Ken Bousquet	Electrical Engineer, Sugarpine Engineering
Mark Schlosser	Sugarpine Engineering (PE, LEED AP)
Mark Zimring	Community At Large
Jen Carlile	Community at Large
Patrick Flora	Contractors Association of Truckee Tahoe
Edward Vento	Contractors Association of Truckee Tahoe
Denise Kowahl	Contractors Association of Truckee Tahoe
Blake Herrschaft	Electrify Tahoe, Peninsula Clean Energy
Kristi Thompson	MWA Architecture
Supporting Town Staff	
Jen Callaway	Town Manager
Hilary Hobbs	Assistant to the Town Manager
Denyelle Nishimori	Community Development Director
Mike Ross	Chief Building Official
Sara Sherburne	Sustainability Program Analyst
Carmen Lopez	Sustainability Program Analyst
Erin Brewster	Sustainability Program Manager

Between May 2022 and November 2024, Town staff and ID360 facilitated eight Stakeholder Committee meetings and three community meetings (two in-person and one virtual) to discuss options for reach codes and other local building code amendments to support building decarbonization and electric vehicle charging infrastructure. Meeting slides, recordings, and other materials are posted on the Keep Truckee Green website at KeepTruckeeGreen.org/Buildings. The Town also released a building energy use survey in both English and Spanish, which included questions on a broad range of building decarbonization topics (including reach codes) in summer 2024.

There were significant delays in the reach code exploration process in 2023, due to Town staff transitions, delays in some of the statewide cost-effectiveness studies for reach code options, and a pending court case about the City of Berkeley's natural gas ban. In 2020, the California Restaurant Association (CRA) filed a lawsuit challenging Berkeley's ordinance prohibiting the installation of new natural gas infrastructure for buildings, with the case eventually reaching the 9th Circuit Court of Appeals. This court case had significant implications for the reach code options that could be considered by local jurisdictions in California, resulting in many cities, including Truckee, pausing their

reach code process until the outcome was finalized. The 9th Circuit Court of Appeals issued a ruling in April 2023 stating that Berkeley's natural gas ban was unlawful because it preempted the 1975 Energy Policy and Conservation Act (EPCA), which grants the federal government the sole authority to regulate energy standards for certain appliances. In January 2024, the 9th Circuit denied a petition for the case to be reheard by the full court, so their original ruling stands.

The outcome of the 9th Circuit ruling affected the reach code options that the Town could pursue, as ordinances that directly or indirectly prohibited the use of natural gas appliances regulated under EPCA (including heating and water heating equipment) are no longer considered lawful in the states under the 9th Circuit's jurisdiction. The ruling also created legal uncertainty around "electric-preferred" ordinances, which apply higher building-level efficiency standards to mixed-fuel buildings (buildings using both electricity and natural gas) than all-electric ones. As a result, staff chose to focus the Town's exploration of building energy reach codes on options that set a single building-level energy performance target that applies to both all-electric and mixed-fuel buildings (sometimes referred to as a "one-margin" code), an approach consistent with other cities in California after the 9th Circuit ruling.

Accordingly, the Reach Code Exploration process for both new and existing buildings evaluated three basic types of building code amendments: (1) above-code building energy efficiency requirements, (2) electric readiness requirements such as prewiring for future electrification in mixed-fuel buildings, and (3) above-code EV charging infrastructure requirements. Of those three types of code amendments, only the first is an Energy Code amendment requiring CEC approval.

Cost-Effectiveness Studies

One of the CEC's requirements for local amendments to the Energy Code is that jurisdictions demonstrate that these codes are cost-effective, meaning that the value of the energy savings over time meets or exceeds the value of any additional upfront costs for implementation. Local jurisdictions have the authority to determine cost-effectiveness and must make a finding that an adopted reach code meets the cost-effectiveness requirements in order for the CEC to approve the local amendment. This requirement only applies to Energy Code amendments, and not to amendments to other parts of Title 24 that do not require CEC approval.

In each three-year code cycle, the statewide California Energy Codes and Standards program conducts cost-effectiveness studies for certain reach code options across all of California's 16 climate zones. The Codes and Standards program supports local jurisdictions throughout California in considering local code amendments that improve building energy efficiency, increase use of renewable energy, and support installation of EV charging infrastructure. Costs considered include initial costs for equipment and materials, operation and maintenance costs, replacement costs or residual value, and financing. These costs are assessed over a timeframe of 30 years for residential buildings and 15 years for nonresidential buildings.

These studies use two different methods to assess cost-effectiveness: on-bill and time-dependent valuation (TDV). On-bill cost-effectiveness is intended to more closely reflect costs experienced by utility customers and considers the amount of energy used in the building and utility rates paid by the customer. TDV assesses the societal perspective of costs and benefits, estimating the actual cost of providing energy at different times of day, which may or may not be directly reflected in utility rates. While jurisdictions can use either methodology to assess the cost-effectiveness for CEC approval purposes, staff recommends limiting consideration to options that are cost-effective under both methodologies based on feedback from the Stakeholder Committee.

Members of the Stakeholder Committee expressed that many of the default values and technical assumptions made in the statewide studies were not appropriate for Truckee as they did not sufficiently reflect local costs and conditions. The statewide cost-effectiveness studies for climate zone 16, which includes Truckee, used statewide average construction costs, a default weather file for Blue Canyon, CA, and utility rates from Pacific Gas and Electric. This led to the amended scope of work with ID360 to

incorporate local costs and weather data into the cost-effectiveness studies whenever possible to address some of these concerns. The default values were replaced with Truckee-specific construction costs collected from local contractors, a weather file for Truckee, and utility rates for both Truckee Donner Public Utility District and Liberty Utilities.

Even with these modifications, the cost-effectiveness studies have a number of limitations that affect how accurately the results reflect real-world conditions, including:

- Federal minimum efficiency standards: EPCA prohibits states or local jurisdictions from adopting code amendments that directly or indirectly preempt federally set appliance efficiency standards. This means that the cost-effectiveness models must assume a building uses minimum efficiency appliances, even if that is not reflective of typical installations. Further, reach codes must demonstrate a cost-effective compliance pathway using minimum-efficiency appliances even if that is not the most practical or likely compliance path. Cost-effectiveness studies conducted by the Codes and Standards team typically include analysis of a case that is more reflective of typical appliance installation for comparison.
- Solar PV: The California building code requires installation of rooftop solar photovoltaic (PV) panels on new residential construction, which factors into the code-minimum modelling used in the cost-effectiveness studies. Most of Truckee's residential properties are exempt from this requirement due to snow load and/or tree shading, so this affects the analysis of energy use for the code-minimum case and affects the feasibility and cost-effectiveness of above-code reach code options that include increased solar PV installation.
- Assumption of full-time occupancy: The cost-effectiveness methodology makes assumptions about building occupancy that may not be applicable to Truckee's second homes. Buildings that are occupied less frequently will have longer payback periods for energy efficiency measures. This is particularly relevant for assessing the cost-effectiveness of existing building measures, since approximately half of Truckee's residential buildings are not primary residences.
- Assumption of cooling: The standard energy use model used in cost-effectiveness studies assumes that buildings have cooling as well as heating, though air conditioning is still relatively uncommon in Truckee. This has a big impact on cost-effectiveness calculations for both new construction and existing building measures. Based on Stakeholder Committee feedback, staff requested that ID360 include analysis of a no-A/C case in the single-family residential new construction study, but it was not added to the single-family retrofit study.

Due to these and other limitations, staff emphasizes that the cost-effectiveness study results should not be interpreted as reflecting real-world cost impacts for building occupants in Truckee. The results of these cost-effectiveness studies should only be used to determine the legally viable options for reach codes in Truckee as a starting point for further study.

The cost-effectiveness studies conducted as part of the reach code exploration process were based on the current 2022 Building Standards Code. As the Town's contract with ID360 included funding for a limited number of custom studies, only the following building types were studied: New Single-Family Residential, New Multifamily (low-rise and high-rise), New Nonresidential, and Existing Single-Family Residential. Custom cost-effectiveness studies were not conducted for retrofits of existing multifamily residential or nonresidential buildings. While the Codes and Standards team did publish statewide cost-effectiveness studies for these, they use PG&E rates for Truckee's climate zone. Because Truckee has higher than average construction costs and lower utility rates than the default values used in the statewide studies, there are generally fewer cost-effective options than what is available for climate zone 16 in the statewide studies, so some high-level outcomes can be inferred from these results. The custom cost-effectiveness studies are posted on the Keep Truckee Green website at KeepTruckeeGreen.org/Buildings.

Statewide Building Standards Code Updates

The California Building Standards Code (Title 24), which sets the minimum standards statewide, is updated every three years, including both the Energy Code (Title 24, Part 6) and the California Green Building Code known as CALGreen (Title 24, Part 11). The Town's reach code exploration process began in May 2022, so cost-effectiveness studies conducted as part of this process were based on the 2022 code, which took effect on January 1, 2023. Due to the delays in the reach code exploration process, the current timeline for consideration of code amendments would mean these amendments could reasonably take effect during the 2025 code cycle at the earliest. This means that updated cost-effectiveness studies will need to be completed for the 2025 Energy Code in order for the Town to adopt any energy reach codes.

In addition to the standard triennial code update cycle, the California Building Standards Commission occasionally adopts changes to Title 24 in an "intervening cycle." A CALGreen Intervening Cycle update that went into effect July 1, 2024, significantly increased the requirements for installation of EV charging infrastructure in multifamily residential buildings and nonresidential buildings. These requirements apply to both new construction as well as certain additions or alterations affecting parking and are summarized in Attachment 1. These new requirements addressed the EV charging infrastructure reach codes under consideration by the Town for both new and existing multifamily and nonresidential buildings.

Additional changes, especially to building energy performance and electric readiness requirements, are expected in the 2025 Title 24 code. The 2025 California Energy Code update focuses on expanding the use of heat pumps for space conditioning and water heating in newly constructed single-family, multifamily, and select nonresidential buildings. For new single-family residential buildings, the code includes prescriptive requirements for both space and water heating appliances to be heat pumps, as well as using a dual heat pump baseline for the building-level energy performance requirements. This will effectively require new construction in Truckee to install some form of heat pump for both space and water heating. These updated building-level energy performance standards leave little, if any, room for cost-effective above-code energy efficiency requirements in new construction.

The 2025 code updates also include expanded electric readiness measures for multifamily and nonresidential buildings. Extensive electric readiness measures for new single-family residential buildings were already included in the 2022 code and will carry over into the 2025 code. Accordingly, staff do not believe there is an opportunity for above-code electric readiness requirements in new construction or some types of retrofits. All anticipated updates to the 2025 Building Standards Code are also summarized in Attachment 1.

Stakeholder and Community Feedback

The Town and ID360 facilitated eight Stakeholder Committee meetings between May 2022 and November 2024 to review and receive input on various reach code options. In 2022, ID360 facilitated polling from Stakeholder Committee members to obtain policy direction for continued consideration of reach code items. The resulting Policy Direction Summary is included as Attachment 2 and includes detailed feedback and policy direction from the Committee. Key direction in 2022 included:

- Ensure backup power is allowed in any adopted energy reach code.
- Provide incentives and education to encourage energy efficiency upgrades in residential buildings (both single-family and multifamily). A majority of Stakeholder Committee members did not recommend pursuing a mandate for residential energy efficiency retrofits in 2022.
- Incentivize commercial energy efficiency upgrades (82% support) and consider a reach code for existing nonresidential buildings (50% support) for the 2025 code cycle.
- Explore both incentives and mandates for above-code EV charging infrastructure requirements for existing single-family buildings.
- Consider a reach code for above-code EV charging infrastructure requirements for multifamily residential and nonresidential buildings when parking is added or altered.

- Consider EV charging infrastructure requirements for new multifamily residential and nonresidential buildings, but not new single-family residential buildings.

It is important to note that this direction preceded the cost-effectiveness studies as well as the legal challenges to Berkeley's natural gas ban, so some of the reach code options originally under consideration in 2022 are no longer available to the Town. After the pause in the reach code exploration process in 2023, the Town reconvened the Stakeholder Committee in 2024. Additional polling was conducted to assess overall support for reach code options given the changes in available policy options. This round of polling was intended as an informal process to gauge general levels of support for policy option and gather additional feedback on the revised list of potential reach codes. Polling was not conducted on EV charging infrastructure requirements for multifamily residential or nonresidential buildings, since the changes recommended by the Stakeholder Committee in 2022 had already been incorporated into the CALGreen mandatory measures as part of the code updates effective July 1, 2024. The results of each poll and a summary of Stakeholder Committee comments and feedback is included as Attachment 3.

Keep Truckee Green staff also sought community feedback on reach codes through three community meetings and a survey on building energy use, which was open for responses in August 2024. The survey was designed to collect information about community members understanding of and interest in building decarbonization, including reach code options, and assess potential opportunities and barriers to implementation. This survey was distributed via social media, the Town's newsletter, the Keep Truckee Green website, and in-person via QR code at the Keep Truckee Green booth at Truckee Thursdays. The majority of responses (66%) were collected from links on the Town's and KTG's social media posts. The survey was available in both English and Spanish, though only English-language responses were received.

The survey results demonstrated much higher community interest in weatherization and energy efficiency measures than in electrification of gas appliances. This is likely due to high concern over cost and resilience to power outages, especially in winter. Of the potential electrification measures, heat pumps were the most popular, with 41% of survey respondents saying they would consider installing a heat pump if they were doing home renovations or replacing appliances. Survey respondents also indicated that financial incentives would be by far the most helpful type of support in implementing building decarbonization measures, with a smaller percentage of respondents expressing interest in technical assistance from experts or help finding a qualified contractor. A summary of community survey results is included as Attachment 4.

Community polling results on reach code options is incorporated into the summary of staff recommendations (Attachment 5) alongside Stakeholder Committee polling results. Community support for reach codes was very low overall, with no policy option having support from a majority of respondents. Staff analyzed the comments received on survey questions about reach codes to identify common themes, which are listed below along with the approximate percentage of comments that addressed each theme:

- **Cost Concerns** (35%): Many respondents are concerned about the already high costs of construction in Truckee, and that proposed reach codes could make those costs even higher for residents and businesses.
- **Sufficiency of Current Standards** (20%): Many respondents say that current standards in California's Title 24 are enough to address energy efficiency and sustainability without additional reach codes.
- **Dislike for Regulatory Approach** (15%): Many respondents disagree with a regulatory approach to building and/or vehicle decarbonization, and value having property owners make decisions for themselves regarding energy efficiency and EV charging upgrades.

- **Skepticism about Renewable Energy and EVs** (10%) Some respondents were doubtful about the efficacy and environmental benefits of renewable energy sources and electric vehicles.

Staff Recommendations for Reach Code Development

The reach code options under consideration were narrowed down during this process by a number of factors, including a technical analysis by ID360, cost-effectiveness results, and the previously mentioned 9th Circuit Court ruling. Staff then assessed the remaining code options based on Stakeholder Committee and community feedback.

With only one exception, there were three reasons why staff did not recommend moving forward with further investigation of reach codes that the initial 2022 Stakeholder Committee feedback had recommended pursuing for the 2025 code cycle:

1) The recommended reach code had already been fully or substantially incorporated into the statewide code or is expected to be included in the 2025 Title 24 update, making further action by the Town unnecessary.
2) The recommended reach code is no longer considered a viable legal pathway (i.e. requiring all-electric construction or installation of electric appliances) or is legally uncertain (i.e. "electric-preferred" ordinances) due to the 9th Circuit Court ruling in CRA v. City of Berkeley.
3) Once the cost-effectiveness studies were completed, the recommended reach code did not have options meeting the cost-effectiveness requirements necessary for CEC approval.

The changes to Title 24 adopted in the Intervening Cycle effective July 1, 2024, and proposed for the 2025 code cycle (effective January 1, 2026) included many significant updates to building-level energy performance standards, electric readiness, and EV charging infrastructure requirements. Based on initial analysis of the proposed 2025 code, staff anticipate that these changes will fully address the high-performance energy reach codes for new single-family residential and EV charging infrastructure requirements for new multifamily residential and new and existing nonresidential buildings. Additionally, the anticipated 2025 code updates substantially incorporate high-performance energy efficiency requirements for new multifamily residential and new nonresidential construction to the point that staff does not anticipate the potential for meaningful above-code requirements that meet CEC requirements for cost-effectiveness. Accordingly, staff does not recommend moving forward with any reach codes for new construction given these code updates. This is consistent with the approach taken by South Lake Tahoe and many other California jurisdictions that are similarly not pursuing any reach codes for new construction.

An overview of each type of reach code under consideration, support from the Stakeholder Committee and community members, and reasons for staff recommendations can be found in Attachment 5. Additional detail is provided below for the few measures where staff recommendations differ from direction received by the Stakeholder Committee in 2022 and/or 2024 in cases where the policy option was not fully addressed by statewide code updates.

- Energy Reach Codes for Nonresidential New Construction: While the Stakeholder Committee did not recommend new nonresidential energy reach codes in 2022, this option received the highest support of any policy option in 2024 surveys (though only 33% of Committee members responded to this poll). The custom cost-effectiveness studies for the 2022 code indicated that a high-performance energy efficiency reach code was only cost-effective for the medium retail (24,500 square feet) prototype, and only allowed for an above-code energy efficiency level of 2% higher than code minimum. From 2021-2023, there were no permits for new nonresidential construction with this size and use type, suggesting little to no impact from adopting this type of reach code. All other nonresidential use types did not have cost-effective energy reach code options in Truckee's climate zone that are still considered legally viable after the 9th Circuit Court ruling in CRA v. City of Berkeley, or were only cost-effective using the TDV methodology and not on-bill (meaning that they would not be cost-effective from a customer perspective).

The 2025 Energy Code updates do include some changes to energy performance requirements for nonresidential new construction, including prescriptive heat pump requirements for all offices and schools and additional electric readiness measures that will partially address this policy option. The 2022 Energy Code is already structured to strongly encourage heat pumps for small-to-medium retail, grocery, schools, and banks. Given the lack of legally viable reach code options for most nonresidential use types, the extremely low number of permits for the one nonresidential use type that has a viable reach code option, the low available compliance margin for retail uses, and the changes to the energy performance requirements in the 2025 Energy Code, staff does not believe there is room for meaningful above-code requirements for this type of policy and does not recommend further research.

- Energy Reach Codes for Nonresidential Retrofits: In 2022, 50% of participating Stakeholder Committee members voted in favor of considering mandates for energy efficiency upgrades in existing nonresidential buildings. However, viable reach code pathways were significantly impacted by the 9th Circuit Court ruling on Berkeley's natural gas ban. This means that many of the options under consideration in 2022, such as requiring new equipment to be electric, can no longer be pursued by the Town. While the Town did not conduct custom cost-effectiveness studies for existing nonresidential buildings, the statewide studies did not reveal any cost-effective options for energy reach codes in Truckee's climate zone (except for options that are no longer recommended given the 9th Circuit Court ruling in CRA v. City of Berkeley). This means there are currently no viable reach energy code pathways at this time for existing nonresidential buildings in Truckee. The 2025 code updates do include some increased energy performance requirements and electric readiness requirements for nonresidential retrofits. While reach code options are not available, the Town could pursue other types of voluntary and mandatory measures for existing nonresidential buildings, which will be evaluated as part of the Existing Building Decarbonization Roadmap.

- EV Charging Infrastructure for Existing Single-Family: In 2022, 70% of participating Stakeholder Committee members voted in favor of mandating EV charging infrastructure requirements for certain retrofits of existing single-family homes, though this represented only 47% of the full Stakeholder Committee (not all Committee members participated in the poll). When updated polling was conducted in 2024, this option had much lower support from Stakeholder Committee members and extremely low support from the community. Given that this option was not endorsed by a majority of Stakeholder Committee members in either 2022 or 2024 and had very low support from the community, staff does not recommend further investigation of this policy. This approach would also be most consistent with the concerns expressed over cost impacts, as EV charging infrastructure for existing single-family buildings would increase costs without achieving GHG emissions reduction.

- EV Charging Infrastructure for Existing Multifamily Residential: While the Stakeholder Committee direction in 2022 was to further research policy options for EV charging infrastructure in existing multifamily residential buildings, this policy option had only moderate support from the Stakeholder Committee and very low support from the community in 2024. The Intervening Code Cycle in 2024 did substantially increase EV charging infrastructure requirements for new multifamily buildings, but this did not apply to existing buildings. Staff recommends focusing on other, higher-impact policy options for GHG emissions reduction in the near term, though this policy could still be explored in future years. Alternatively, Council could direct staff to further research this policy option for the 2025 Building Standards Code cycle in addition to the other recommendations outlined in this report.

- Energy Reach Codes for Single-Family Retrofits: Town staff recommend further targeted investigation of energy reach codes for retrofits of existing single-family buildings. This option was not recommended by the Stakeholder Committee in 2022 and did not have support from a majority of the Committee in 2024. While incentive-based approaches were more popular with

both the Stakeholder Committee and the community (and can still be pursued), staff believes that a heat pump air conditioning (A/C) requirement would sufficiently address concerns about cost and resilience to power outages and would be effective in achieving GHG emissions reductions in existing single-family buildings. Heat pump air conditioning (A/C) is a type of reach code for single-family residential retrofits that requires new air conditioning installations to be heat pumps instead of A/C-only units and can include appropriate exemptions as well as alternative efficiency-based compliance pathways. Staff recommends further research of this type of reach code, which is described in more detail below.

Recommendation: Heat Pump Air Conditioning Incentives and Policy Research

Based on the results of the reach code exploration process and analysis of building permit data, staff recommend further research into options to increase use of heat pump air conditioning (A/C) in existing single-family residential buildings in Truckee. The goal would be to incentivize and/or require that a heat pump be installed instead of an A/C-only unit whenever cooling equipment is added to a single-family home. Heat pump A/C can provide the same cooling benefits as an A/C-only unit, but also provides heating alongside an existing gas furnace as a dual-fuel heating system. Heat pumps will be required for newly constructed single-family homes in the 2025 Energy Code, so this measure would focus on installation of heat pump A/C in existing buildings.

Staff recommends further investigation of both incentives and policy options for promoting heat pump A/C. Due to the substantial overlap in the scope for pursuing incentive and policy options, these two approaches could be researched in parallel with minimal incremental effort. Staff recommends the following next steps:

1. **Develop a residential heat pump A/C incentive program.** Assess local incremental costs for heat pump A/C compared to A/C-only installations and propose an incentive program that will fully offset incremental costs for similarly-sized units, incentivize upsizing of heat pumps to cover a larger share of the heating load, and incentivize replacement of separate furnace and A/C units with a packaged dual-fuel heat pump system. Include all related incremental costs including potential panel upgrades and control systems. CEC grant funds could be used for development of this incentive program but grant funds cannot be used for any costs related to implementing the incentive program.

2. **Analyze potential policy options for a heat pump A/C requirement in Truckee.** Review existing heat pump A/C policy language such as the 2025 CALGreen residential voluntary measures with consideration of local factors and recommend any policy pathways that would be appropriate for Truckee's climate. As part of this analysis, consider options for heat pump A/C sizing, covered installation types, covered residential building types, and recommendations for appropriate exemptions and alternative compliance pathways such as efficiency measures. Recommended policy options would be presented to the Town Council in Spring 2025 for consideration. At that time, the Town Council could decide whether to move forward with development of a proposed ordinance for heat pump A/C.

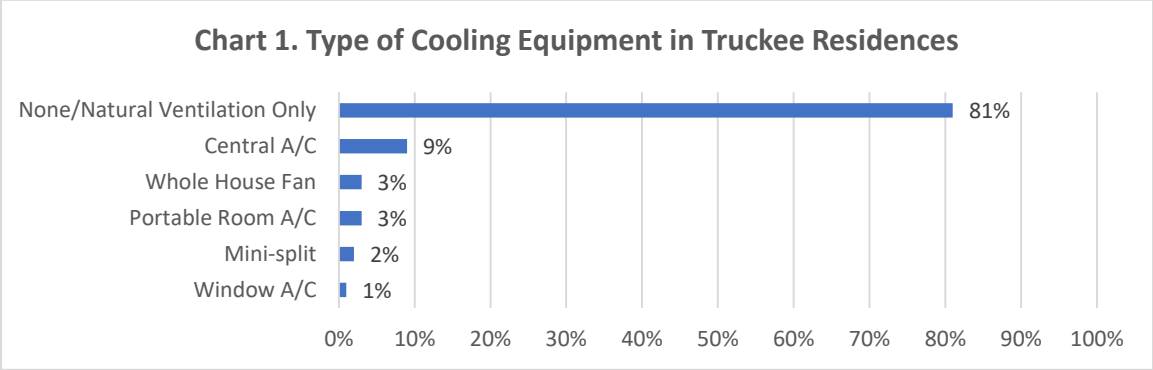
3. **Integrate heat pump A/C training into contractor education programs.** Develop contractor training specific to heat pump A/C, leveraging the CTA's Building Decarbonization Pilot Program. While this training is not necessary from a technical perspective since the process is fundamentally the same as A/C installation, Town staff recommends providing support for unit sizing, understanding any relevant Town incentive programs and ordinances, and details on incremental installation costs and expected impacts on customer utility bills.

Town Council could provide direction to move forward with all three components described above, to move forward with incentives and/or contractor education only, or not to move forward with any heat

pump A/C-focused programs and policies and instead to focus on other types of building decarbonization programs. The incentive program could be launched as soon as it receives scope and budget approval from the Town Council (anticipated in late winter), provided the Town can obtain consultant support to operate the program. A proposed heat pump A/C policy could be considered as part of the 2025 building code updates (adopted in 2025, effective January 1, 2026) or on another later timeline recommended by the Town Council.

Heat Pump A/C: Background and Local Context

According to a 2022 TDPUD survey, only 15% of residential customers had some form of mechanical cooling, with central A/C being the most common type of cooling equipment. Heat pump A/C requirements apply to installed air conditioning units, including centrally ducted A/C and/or mini-splits, but would not apply to portable equipment like window units or ventilation-only cooling such as a whole house fan. While A/C is still relatively uncommon in Truckee, the rate of installation is increasing rapidly, with 85% of A/C units installed in the last three years.[1]



This trend is expected to continue as Truckee experiences the impacts of climate change. Truckee's average high temperature is expected to increase by around 4-5 degrees Fahrenheit by mid-century compared to historical averages, with a sharp increase in the average number of extreme heat days (days with a high temperature above 88.8F) and cooling degree days. This expected increase in demand for cooling presents a time-sensitive opportunity to promote the installation of heat pumps instead of A/C-only units in Truckee.

Table 2. Anticipated Climate Change Impacts on Cooling Demand in Truckee[2]

Metric	Baseline (1961-1990)	Mid-Century (2035-2064)
Average High Temperature (F)	58.1	62.5-63.4
Annual Extreme Heat Days	3	22-30
Annual Cooling Degree Days	16	114-178

Air conditioners and heat pumps are essentially the same type of equipment, which move heat from one place to another rather than generating it through combustion. Heat pumps have a reversing valve that allows them to transfer heat in both directions, providing either heating or cooling, while A/C units can only provide cooling. There are types of both A/C units and heat pumps designed for use with centrally ducted systems as well as ductless units such as mini-splits. The installation process is nearly identical for similar configurations of A/C and heat pump units, so contractors familiar with A/C installation would be capable of performing heat pump A/C installation.

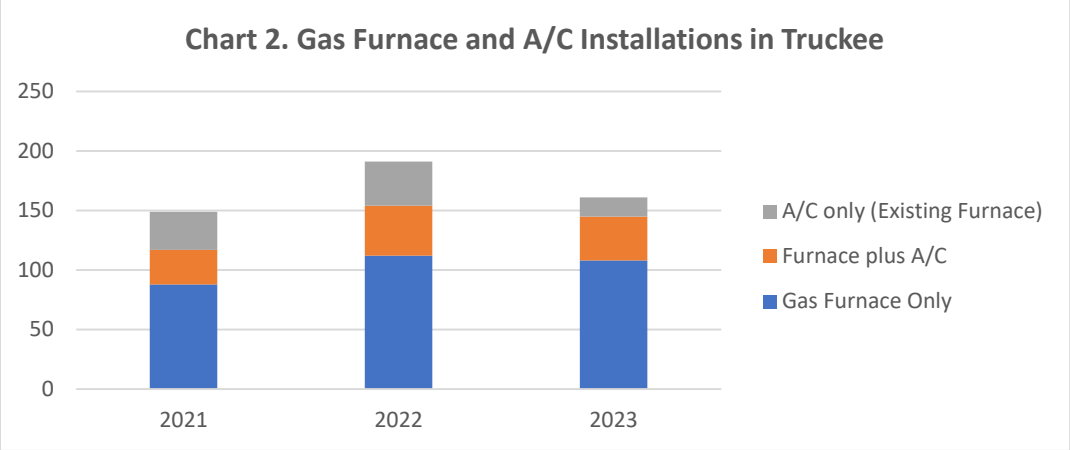
[1] TDPUD Residential Energy Use Survey
[2] Data from Cal-Adapt.org, with Mid-Century ranges based on Medium (RCP 4.5) and High (RCP 8.5) Emissions Scenarios

Heat pump air conditioning is emerging as a popular area of focus for building decarbonization efforts, especially in California, and has been shown to provide benefit in a wide range of climates. Heat pump A/C units have demonstrated high performance and customer satisfaction when replacing existing A/C units, including in climates both warmer and colder than Truckee. The City of San Mateo adopted an ordinance in 2022 requiring installation of a heat pump air conditioning system whenever an air conditioning unit is installed or replaced. Heat pump A/C requirements are also under consideration by several other jurisdictions in California and will be included in the 2025 CALGreen residential voluntary measures. The draft CALGreen language includes an alternative compliance pathway of energy efficiency measures (ducts and insulation), which would likely need to be included in any locally adopted heat pump A/C requirement. Staff recommends evaluating the incremental costs and potential policy options considering Truckee's climate and local costs.

There are three basic types of A/C unit installation currently happening in Truckee. A heat pump A/C policy and/or incentive program could be developed for any or all of these scenarios:

- Central A/C only: These are central A/C units installed alongside an existing gas furnace, using existing ductwork. A coil and condenser heat pump unit can be installed with an existing furnace through the same type of installation process, creating a dual-fuel heating system. Most of these types of installations are adding new A/C to the home rather than replacing an existing system.
- Combined Furnace and A/C installation: These are new central A/C units installed at the same time as a gas furnace replacement. More than 20% of permitted gas furnace replacements in Truckee from 2021-2023 included installation of an A/C unit. Some of these are replacing existing A/C units, but most are adding new cooling capacity to an existing building. These types of simultaneous A/C and furnace installations are good candidates for full replacement with a heat pump, so staff recommends evaluating the relative costs and potential incentives to encourage full system electrification. While most Truckee homeowners may prefer a dual-fuel system, around 20% of respondents to the Town's Building Energy Use survey indicated they would consider replacing a gas furnace with a heat pump, and incentives could help interested homeowners make this switch.
- Mini-splits: Ductless mini-split systems are a significantly less common A/C type in Truckee than central A/C. In some cases, these units are designed to provide supplemental heat and/or cooling alongside a separate primary system, though they can also function as a primary heating and/or cooling system for a residence. Based on permit data, staff could not determine if the majority of mini-splits installed in the past three years were intended to provide heat, cooling, or both.

Heat pump A/C provides an important alternative to full heating system electrification that still supports community-wide building decarbonization efforts. Focusing on cooling equipment rather than heating equipment allows residents to keep their existing furnace units if desired, while gaining high-efficiency supplemental heating at minimal incremental cost (that could be fully offset by a Town incentive program). There were only nine permitted gas-to-electric heating conversions from 2021-2023, but there were 172 new central A/C unit installations during the same time. While a dual-fuel system does not necessarily fully offset natural gas use for heating (though it can be sized to cover most or all of the expected heating load), the higher number of installations that would be achieved by a heat pump A/C requirement compared to heat pump incentives means the total GHG reductions will be substantially greater. Staff recommends continuing to explore ways to better incentivize full system electrification while supporting dual-fuel options such as heat pump A/C in the near term.



The benefits of focusing on installation of cooling equipment rather than heating equipment in Truckee to accelerate deployment of heat pumps include:

- Lower incremental cost: Because A/C-only units and heat pumps are essentially the same type of equipment, there are significantly lower incremental costs for installing heat pump A/C instead of A/C-only units compared to full electrification of heating systems. The exact incremental cost for heat pump A/C will depend on the relative sizing of the heat pump compared to an A/C-only unit, as labor costs are roughly equivalent for these installs, but is still substantially lower than full system electrification. Lower incremental costs allow the Town to more easily fund incentives to encourage upsizing of heat pump A/C to cover a larger share of the heating load. Adding new cooling capacity to an existing building is also inherently not cost-effective because it is a new use of energy, which will increase utility bills. However, heat pump A/C as a replacement for existing A/C-only units has been shown to decrease total utility costs in cold climates even when the heat pump was sized to cover cooling load only.

- Does Not Regulate Gas Equipment: Concern over reliability of electric appliances, particularly heating equipment in winter, was among the most common feedback received during the community engagement process on reach codes. Interest in electrification is low in Truckee, with only 20% of survey respondents willing to consider fully electrifying their heating system, and many of these respondents being deterred by incremental costs and other factors. Heat pump A/C requirements would not regulate the installation or replacement of gas furnaces in existing buildings, allowing homeowners to continue to utilize their existing gas furnaces while experiencing the benefits of supplemental heat pump heating. This would avoid issues with emergency furnace replacement, a particular concern in winter, as there would be no conditions imposed on heating equipment. Focusing exclusively on electric equipment also avoids the legal issue at the heart of the 9th Circuit Court ruling on Berkeley's natural gas ban, since it would not affect existing or new gas equipment.

- Higher impact: Due to the 9th Circuit Court ruling, Truckee cannot regulate the installation of gas furnaces in existing buildings. Incentive-only strategies to encourage gas furnace replacement with heat pumps (including dual-fuel heat pumps) are likely to have limited impact given low community interest in electrification. A heat pump A/C requirement for newly installed central A/C units would have the equivalent GHG emissions reduction impact of at least 43% of annual gas furnace replacements converting to dual-fuel heat pumps, an outcome unlikely to happen through incentives alone.

A study of heat pump A/C performance in northern Illinois[3], which has colder winter temperatures than Truckee, examined the results of heat pump A/C replacing existing centrally ducted A/C units in 33 homes, with the heat pump units sized based on existing A/C unit size (which would not fully cover the winter heating load). The homeowners surveyed had extremely high satisfaction rates after 6 months (including a full winter season), with the vast majority reporting cost savings and increased comfort compared to their previous A/C-only unit. These homeowners reported an average net savings of $45 per month on energy costs after accounting for lower gas bills and higher electricity costs.

One of the primary considerations in developing a heat pump A/C requirement is determining the sizing requirements from the heat pump. The majority of California's climate zones are cooling-dominated climates, which means a heat pump unit sized for cooling load should be sufficient to fully cover the smaller heating load. However, Truckee is in a heating-dominated climate, which means a heat pump sized to match the equivalent cooling-only A/C unit will not be capable of fully covering the heating demand but will rely on supplemental heat from the existing gas furnace on colder days. Staff recommend considering the full range of sizing requirements to determine what a reasonable sizing requirement is for Truckee's climate, as well as options to incentivize upsizing of heat pump units to cover a larger share of the heating load. Even if units are sized only for the cooling load rather than the full heating load, studies such as the previously referenced Illinois pilot program show that heat pump A/C can have significant energy efficiency and GHG reduction benefits in cold climates.

A related consideration is the need for electrical panel upgrades, which could be triggered depending on the relative sizing of a heat pump to the A/C unit it is replacing and can add significant additional cost to an installation project. The draft CALGreen language for heat pump A/C in the 2025 residential voluntary measures includes an exemption that does not require installation of a heat pump if it would require an electrical panel upgrade when installation of an A/C-only unit would not. Staff recommend evaluating a similar exemption as part of evaluating policy options and assessing potential costs from panel upgrades as part of a heat pump A/C incentive program.

Next Steps

If Council approves these recommendations as proposed, staff will engage a consultant to implement the three strategies outlined above and anticipates being able to get a contract in place in early 2025. The goal would be to have a proposed incentive program ready for Council consideration by late winter 2025, and policy options ready for Council consideration in spring 2025. Ordinance language could be ready for Council consideration along with the 2025 building code updates in the second half of 2025.

Staff are currently working on an Existing Building Decarbonization Roadmap, that will assess a wide range of types of potential decarbonization measures for existing residential and commercial buildings in Truckee. This will include incentive-based strategies recommended by the Stakeholder Committee, as well as other types of regulatory approaches aside from building code amendments. Once staff has direction from Council on reach code options, a draft Roadmap can be finalized and presented to Council for feedback, anticipated in early 2025. This Roadmap will include high-priority measures recommended for implementation in the next few years that Council can consider for inclusion in the next Council Priorities Workplan.

The Town was recently awarded a $700,000 CEC grant to support building decarbonization planning. Up to $85,000 in grant funding can be leveraged to support the heat pump A/C recommendations (or development of another building decarbonization program or policy). Based on the feedback from the Stakeholder Committee and community collected during the reach code exploration process, staff have proposed additional projects in the scope of work for the CEC grant designed to explore solutions to community concerns over cost and power outages. Potential grant-funded projects to be included in the Town future greenhouse gas reduction workplan could include development of an equitable funding

[3] Variable Speed Heat Pumps as Air Conditioner Replacement, Center for Energy and Environment, January 31, 2024.

strategy to decarbonize existing buildings in Truckee and an Energy Resilience Plan that will identify strategies the Town can implement to improve community resilience to power outages while supporting GHG emissions reduction.

Priority:

☐	Enhanced Communication	☒	Climate and Greenhouse Gas Reduction	☐	Housing
☐	Infrastructure Investment	☐	Emergency and Wildfire Preparedness	☐	Core Service

Fiscal Impact: If these recommendations are approved, staff anticipates consultant costs of approximately $85,000 to develop a heat pump A/C policy and incentive proposal, which could be fully funded by the Local Government Building Decarbonization Challenge grant from the California Energy Commission. Supporting this consultant-led project is estimated to require significant staff time from the Keep Truckee Green division, as well as additional time from the Buildings Division and other Community Development Department staff. If approved, budgeted funds for the $85,000 would be available and allocated out of the $700,000 appropriated in CIP 2422: CEC Building Decarbonization Grant.

The CEC grant program only funds decarbonization planning and not program implementation, so while these funds can be used to design a proposed rebate program, they cannot be used to fund the resulting incentives. Accordingly, additional funding would be needed to implement any proposed incentive program as well as developing new contractor training materials, and a budget amendment these initiatives will be included as part of a subsequent proposal to the Town Council once program details have been developed.

If the Town Council directs staff to further research other types of reach codes or include additional building types beyond existing single-family residential buildings, additional funding would be needed to conduct the necessary additional cost-effectiveness studies and expand the Reach Code Development project scope. This additional funding would not be within the CEC grant-funded budget. Additional Town staff time would also be needed to support this expanded project scope, which may delay implementation of other measures in the current Council Priorities Workplan.

Public Communication: Agenda posting, social media posts, and emails sent to community members that signed up to receive updates about the Town's building decarbonization initiatives. Additionally, the reach code exploration process included eight stakeholder meetings, three community workshops and a community survey.

Attachments:

1. Overview of Code Changes
2. 2022 Policy Direction Summary
3. 2024 Policy Direction Summary
4. Community Survey Summary
5. Reach Code Recommendations Summary