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STAFF REPORT

DATE: September 10, 2019

TO: City Council

FROM: Ashley Feeney, Assistant City Manager
Gregory Mahoney, Assistant Director, Community Development and Sustainability

SUBJECT: Ordinance to amend the City's Residential Energy Efficiency Reach Code

Recommendation

Introduce an Ordinance:

1. Introduce the attached ordinance amending Section 8.01.092 of Chapter 8 (Buildings) of the Davis Municipal Code to:
 - i. Require mixed-fuel single-family dwellings (SFD) and low-rise multi-family residential projects to achieve a total Energy Design Rating (EDR) margin of 9.5 for SFD and 10 for low-rise multifamily, per the cost effectiveness study prepared by Frontier Energy and Misti Bruceri & Associates dated, dated June 2019.
 - ii. Require pre-wiring for a future retrofit to all-electric appliances in mixed fuel-new single family dwellings and low-rise multi-family buildings.

Fiscal Impact

The fiscal impacts to the City associated with this reach code are negligible. There may be a minor increase in time associated with reviewing plans, issuing building permits and conducting inspections. These costs will be recovered via plan check and permit fees collected.

City Council Goals

Goal #3: Pursue Environmental Sustainability

Objective 1: Reduce the community's carbon footprint.

Executive Summary

The City of Davis has a history of energy efficiency and sustainability that spans over four decades. The city adopted the first of their kind energy efficiency and resale ordinances in the 1970's and continued the effort in 2008 with the first green building ordinance in the region and the most comprehensive in the state. The city is continuing to lead the state in sustainability by proposing a reach code that will incentivize all-electric single-family dwellings and low rise multi-family buildings. The ordinance will also require new single-family dwellings and low rise multi-family buildings that are designed as mixed fuel buildings to pre-wire for a future retrofit to all-electric appliances. The proposed ordinance will be consistent with all of the reach codes adopted over the last 12 years by requiring a cost effective compliance margin. Full CALGreen, Tier I compliance regarding energy efficiency has not been found to be cost effective, so the

ordinance will require a total Energy Design Rating (EDR) margin of 9.5 for SFD and 10 for low-rise multifamily consistent with the cost effectiveness study.

The California Energy Commission has approved the 2019 California Energy Code that will go into effect on January 1, 2020. This code will require that single-family dwellings and low-rise multifamily buildings offset 100% of the electricity used on site, excluding some specific electrical loads. The purpose of this ordinance is to take the additional step of providing a path to reduce the use of fossil fuels in residential buildings. Since 2008 the City has enacted an energy efficiency reach code that requires projects to go beyond the requirements of both the California Energy Code and the California Green Building Standards Code (CAL Green) to a point that is cost effective. The only difference with this proposed ordinance is that all-electric homes will not be required to go beyond the minimum code requirements. The building community in Davis is familiar with, and accustomed to additional sustainability requirements for construction projects. This step is consistent with Council goals and the California Energy Action Plan policy directive to support local reach codes.

Background and Analysis

Every three years, the California Building Standards Commission updates the California Building Standards Code (Title-24). In July of 2019, the California Building Standards Commission announced the publication of the new 2019 California Building Standards Code, which includes the 2019 California Energy Code. These codes will become effective on January 1, 2020.

Consistent with the City Council goal noted above, staff have analyzed the potential for requiring all-electric new residential buildings. There is the potential that it would meet with significant resistance from the building community and could possibly result in litigation. As an alternative, staff is proposing to incentivize rather than require all-electric buildings. The proposed reach code ordinance would be consistent with the city's energy efficiency approach of requiring projects to exceed the requirements of the California Energy Code to a point that is determined to be cost effective. The reach code would be applicable only to mixed fuel homes, which use natural gas or propane to power one or more household appliances. As an incentive for all-electric homes, the ordinance would not include additional energy efficiency requirements beyond code compliance for homes that do not utilize fossil fuels. To facilitate future retrofits for mixed fuel homes, the ordinance will require pre-wiring for electric appliances.

In 2020, the Energy Code will begin using the Home Energy Rating System (HERS) scale as the primary metric to demonstrate compliance with the energy code. The HERS scale rates a home on a scale from zero to 250. An EDR score of 100 is equivalent to a home built in compliance with the 2006 International Energy Conservation Code while a zero net energy home has an EDR of zero. EDR is still based on Time Dependent Value (TDV) of energy but it uses a building that is compliant with the 2006 International Energy Conservation Code (IECC) as the reference building.

The EDR is calculated by Energy Commission approved software and has two components:

- 1) An "Efficiency EDR" which represents the building's energy use without solar generation.
- 2) A "Total EDR" that represents the final energy use of the building based on the combined impact of efficiency measures, photovoltaic (PV) generation and demand flexibility.

For a building to comply, two criteria are required:

- 1) The proposed Efficiency EDR must be equal to or less than the Efficiency EDR of the Standard Design, and
- 2) The proposed Total EDR must be equal to or less than the Total EDR of the Standard Design.

Energy code compliance software measures the Efficiency-EDR and the Total-EDR. A home must first meet a minimum Efficiency EDR in order to prohibit the construction of an inefficient home and then over-sizing the PV system to offset the lack of efficiency. A project may improve on building efficiency beyond the minimum required and subsequently reduce the PV generation capacity required to achieve the required Total EDR but may not increase the size of the PV system and trade this off with a reduction of efficiency measures. The total EDR takes into consideration the contribution of PV and demand flexibility. The margin is the number of points on the HERS scale that the reach code would require beyond the minimum code requirement. A total EDR margin of 10 would mean that the Total EDR would be 10 points lower than a code compliant home. For instance if a code compliant mixed fuel home had a Total EDR of 25 then the proposed ordinance would require that the same mixed fuel home be required to achieve a score of 15 on the HERS scale.

Single family dwellings that are constructed as mixed-fuel dwellings will be required to meet a total Energy Design Rating margin of 9.5 and pre-wire for future retrofit. The total EDR margin of 9.5 will require additional energy efficiency measures as well as photovoltaics and demand flexibility. Low-rise multifamily dwellings that are constructed as mixed-fuel dwellings will be required to meet a total Energy Design Rating margin of 10 and pre-wire for future retrofit as applicable. A cost effectiveness study has been provided by the Codes and Standards Program, Pacific Gas and Electric Company. The study was prepared by Frontier Energy and Misti Bruceri & Associates. The cost effectiveness study supports a total EDR margin of 9.5 for mixed fuel homes in climate zone 12.

Cost Effectiveness Analysis

For locally adopted energy, efficiency “reach codes” to be enforceable, the Warren-Alquist Act of 1974 requires that the local government demonstrate that the required measures will be cost effective. In the past, the City has largely relied upon negotiated Development Agreements with larger developments to achieve voluntary agreement to comply with energy efficiency and PV provisions that may not otherwise be enforceable, absent a Development Agreement. With a cost effectiveness study the City is able to adopt local “reach codes” exceeding the standard State energy efficiency requirements, eliminating the need to negotiate such requirements on a project-by-project basis, and providing for consistency amongst projects.

Single family dwellings that are constructed as mixed-fuel dwellings that meet a total EDR margin of 9.5 will cost approximately \$5045 more than a the Standard Design code complaint house. The percentage of savings will be approximately 17% and the emissions savings will be approximately .35 lbs.-CO₂/sf/year. A 2000 sq. ft. home will save 700 lbs. of CO₂ per year.

Single family dwellings that are constructed as all-electric homes will see an approximate savings in natural gas infrastructure cost of \$5349 per home. Emissions savings for a Standard Design all-electric home will be approximately 1.07 lbs.-CO₂/sf/year. A 2000 sq. ft. home will save 2140 lbs. of CO₂ per year more than a Standard Design mixed-fuel home.

Outreach

The proposed ordinance has been presented to the Natural Resources Commission on two occasions. The NRC has expressed unanimous support for the reach code. Staff met with the Executive Director of the Chamber of Commerce and then again with a larger group to go over the proposed ordinance. There were no comments forwarded to staff either in support or opposition of the ordinance. On August 13th the proposed ordinance was presented and explained in a public outreach meeting held in the Community Chambers. The attendees expressed support of the ordinance. There were no negative comments voiced during the presentation. Although a number of contractors and developers were invited to the meeting, there were no contractors or developers present at the meeting.

Ordinance Applicability

If the ordinance is adopted by the City Council, it will become effective after it is approved by the California Energy Commission. The Energy Commission approval process typically takes 2 to 3 months. All building permit applications submitted on or after the effective date will be required to comply with the updated standards. Staff will provide ample notice to contractors and architects in advance of the effective date. However, it should be noted that residential subdivisions with existing Development Agreements (ex: Cannery, Chiles Ranch, Grande) will be subject to the terms of the Development Agreement, which may have different thresholds for energy efficiency and PV. Therefore, the provisions of the ordinance would apply to new developments moving forward. A key advantage to the proposed ordinance is that it will provide a greater level of consistency between projects and result in less, or no, need to negotiate energy efficiency and PV requirements for new single family and low-rise apartments.

Attachment

1. Proposed Ordinance
2. Cost Effectiveness Study