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STAFF REPORT (ID # 3028)

2016 ENERGY & FIRE CODE AMENDMENTS - Public Hearing (Published Notice) to Introduce Ordinances Amending FMC Chapter 15.35 (Fire Code) to Require the Installation of Fire Sprinklers in Non-Residential Properties Undergoing Substantial Alterations and Amending FMC Chapter 15.44 (Energy Code) to Require the Installation of Photovoltaic Solar Energy Systems in New Residential Construction.

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Executive Summary: On November 1, 2016, Council adopted the 2016 California Building Standards Code, effective January 1, 2017. Staff had anticipated bringing forward a proposed amendment of the Energy Code at that time that would have required installation of solar energy systems in new residential development, but was unable to do so because a required cost-effectiveness study being prepared by the California Energy Commission (CEC) was still in process. That study, along with a draft model ordinance prepared by the CEC, are now available, and staff has prepared and is recommending adoption of an ordinance requiring solar installation in new residential projects. In addition, staff is recommending an amendment to the Fire Code to require the installation of fire sprinklers in non-residential properties undergoing substantial alterations.

BACKGROUND: On October 11, 2016, staff recommended to the City Council the adoption of the 2016 California Building Standards Code (CBSC), effective January 1, 2017, with certain administrative and technical amendments. Administrative and technical amendments included provisions related to structural changes required to address code deficiencies and local conditions in Fremont. One of these amendments related to the Fire Code (FMC Chapter 15.35), including a specific definition of when alterations prompt sprinkler installation in multifamily residential buildings. Other local amendments were related to the Green Building Code (FMC 15.48) and Energy Code (FMC Chapter 15.44), adopting amendments related to electric vehicle readiness and energy efficiency requirements in new construction, as recommended by the Environmental Sustainability Commission (ESC).

At the same time, staff reported to the City Council that an additional amendment related to mandatory solar energy systems for new residential developments had been recommended by the Environmental Sustainability Commission, but that staff was awaiting the publication of a new "cost-effectiveness" study for mandatory solar. A cost-effectiveness study demonstrating that a locally adopted energy amendment meets certain requirements must be submitted to the California Energy Commission (CEC) for review and approval by the CEC before a local ordinance can become enforceable. Staff reported that it would bring forward a recommendation for a solar photovoltaic (PV) ordinance in early 2017, when a new solar "cost-effectiveness" study and a draft template ordinance were scheduled to be

released by the CEC. On November 1, 2016, the City Council adopted the California Building Standards Code by reference with all proposed local amendments.

All local amendments to the CBSC are required to be filed with and approved by the California Building Standards Commission (BSC) in order to be locally enforceable. The City of Fremont filed its initial changes to the Building Code with the BSC on November 11, 2016, and received a letter from the BSC accepting these modifications on January 23, 2017. In addition, amendments specific to the Energy Code must be filed and approved by the California Energy Commission, along with supporting cost-effectiveness documentation as noted above. Initial changes to the Fremont Energy Code were filed with the CEC on January 23, 2017. After CEC staff review of the amendments, these changes were subject a 60 day public comment period, ending April 10, 2017. The changes are scheduled to go to the full Energy Commission for final approval at the next available meeting.

Since the time of adoption and filing with the BSC, staff has received and analyzed the 2016 "Local PV Ordinance Cost Effectiveness Study" prepared by Davis Energy Group, et.al. for the PG&E Codes and Standards Program and the "Mandatory Requirements for the Installation of Photovoltaic Solar Energy Systems" local solar ordinance template drafted by the CEC, and has presented these to the Environmental Sustainability Commission (ESC). The ESC has recommended that City Council adopt the local solar ordinance template drafted by the CEC, with some provisions for alternatives and exceptions, using the aforementioned 2016 cost-effectiveness study as supporting documentation. In addition, staff has discovered an unintentional omission of non-residential properties in the Fire Code local amendment for sprinkler installations in properties undergoing substantial alterations.

Staff recommends that the City Council adopt ordinances that make additional amendments to the Fire Code (FMC Chapter 15.35) to require the installation of fire sprinklers in non-residential properties undergoing substantial alterations, and amending the Energy Code (FMC Chapter 15.44) to require the installation of photovoltaic solar energy systems in new residential construction.

DISCUSSION/ANALYSIS:

FIRE CODE AMENDMENT

Given recent fires in the City of Oakland, City staff evaluated current codes to see if there were any additional measures that could be taken to address concerns relating to fire-life safety hazards. During the last code adoption cycle in 2016, Fremont amended the Fire Code to include a requirement for installation of Fire Sprinklers in substantially remodeled or altered multi-family residential structures. At that time it was determined that this would be the most cost effective time to add fire suppression systems to a building. The proposed amendment would broaden the requirement to include substantially remodeled or altered commercial and industrial structures.

ENERGY CODE AMENDMENT

At the October 11, 2016 City Council meeting, staff reported that a 2016 solar cost-effectiveness study was being developed at the state level that would provide the necessary supporting documentation for an ordinance for mandatory solar in single and multi-family residential new construction throughout California's various climate zones, including Climate Zone 3 where Fremont is located. Alongside this study, the California Energy Commission

(CEC) was drafting model code language to inform the local government ordinance adoption process, scheduled to be released as final in the spring of 2017.

Currently, the 2016 statewide solar cost-effectiveness study and template ordinance have yet to be formally published, but staff has been informed by the CEC that the City may utilize these documents in their final draft form for its local adoption process at this time. In order to utilize the most up-to-date cost-effectiveness data, and also to promote consistency by utilizing model code language where appropriate, staff recommends that City Council adopt an ordinance for mandatory requirements for the installation of photovoltaic (PV) solar energy systems in new residential construction, utilizing the 2016 statewide solar cost-effectiveness study as supporting documentation required by the CEC for approval of local amendments to the Energy Code.

2016 Statewide Solar Cost Effectiveness Study

Local jurisdictions have the authority to adopt local energy efficiency ordinances, or "reach codes," that exceed the minimum standards defined by the California Building Energy Efficiency Standards Title 24, Part 6 (Title 24), as established by Public Resources Code Section 25402.1(h)2 and Section 10-106 of the Building Energy Efficiency Standards. Local jurisdictions must demonstrate that the requirements of the proposed ordinance are cost effective and do not result in buildings consuming more energy than is permitted by Title 24. In addition, jurisdictions must obtain approval from the Energy Commission and file ordinances with the Building Standards Commission in order for the ordinances to be legally enforceable.

In order to align with these needs, PG&E and its Codes & Standards Program consultant teams prepared the attached 2016 "Local PV Ordinance Cost Effectiveness Study" to help local jurisdictions easily implement solar PV reach codes. The study is designed specifically to provide for PV solar energy systems that would not be oversized for building occupant energy needs and that would be aligned with the statewide goal that all new residential construction be zero net energy (ZNE) by 2020. A cost-effectiveness analysis is provided for all sixteen California climate zones, establishing reach code requirements for on-site renewable energy generation systems in new residential and multifamily buildings sized according to prescriptive and performance models.

Minimum PV system sizes are based on a percentage of total building "time dependent valuation" (TDV) of energy use, an energy metric used by the CEC since the 2005 to evaluate compliance with Title 24 standards. TDV values energy use differently depending on the fuel source, time of day, and season, and is designed to reflect the "societal value or cost" of energy, including long-term projected costs of energy. Using TDV, any electricity used (or saved) during peak periods of the summer has a much higher value than electricity used (or saved) during off-peak periods.

The study used statewide average values for its solar installation cost assumptions, and included the state New Solar Homes Partnership (NSHP) rebate values of $0.50/watt and the Federal Tax Credit of 30 percent of the post-rebate installed system cost. Incremental development costs for single family and multifamily residential buildings were calculated as follows:

	Single Family	Multifamily (per unit)
Includes NSHP Incentive	$3.35/watt (DC)	$3.03/watt (DC)
Excludes NSHP Incentive	$3.70/watt (DC)	$3.38/watt (DC)

Using these values, the study found that in every one of the sixteen climate zones in California, minimum solar PV installations on new residential construction would be both feasible and cost effective in that the benefits provided by the system in terms of utility bill savings during the system lifetime would outweigh the incremental costs of the systems. In particular for Climate Zone 3, where Fremont is located, example system sizes offered the following benefits:

	Single Family	Multifamily (per unit)
System Size	2.6 kW (DC)	1.5 kW (DC)
Annual Electricity Savings	4,049 kWh	2,368 kWh
% Carbon Savings[1]	42.5%	46.6%
Package Cost[2]	$10,448	$5,579
Annual Utility Cost Savings	$732	$361
Simple Payback[3]	14.3	15.5
Lifecycle Benefit-Cost Ratio	1.29	1.19

[1] Based on CA electricity production and equivalent CO2 emission rates of 0.724 lb-CO^2e / kWh & 11.7 lb-CO^2e / therm.
[2] Includes 10% markup for builder profit and overhead. $0.50/W NSHP incentive not applied to package costs.
[3] Assumes no change in annual utility rates. Historically, residential electricity rates have increased an average of 4.5% annually. In early 2017, PG&E increased residential electricity rates by 7% above average 2016 rates.

CEC Model Solar Ordinance

Using the 2016 solar cost effectiveness study, the California Energy Commission developed a draft model ordinance that could be used for local Energy Code amendments requiring the mandatory installation of PV solar energy systems on new single and multifamily residential buildings. The model ordinance requires that buildings first meet Title 24 Energy Code compliance without the use of the PV compliance credit (PVCC), and system sizing requirements align with minimum capacities shown in the study, specified by Climate Zone. In particular, prescriptive system sizes are provided for buildings with up to 4,499 square feet of conditioned space, which is the enclosed habitable space of a building. For buildings with 4,500 square feet conditioned space and above, systems must be sized based on a performance model to meet a minimum percentage TDV. Building developers are accustomed to calculating for TDV as part of their design and submission process to demonstrate that they are complying with the minimum requirements of Title 24.

CLIMATE ZONE 3

Conditioned Space	Minimum System Size
< 1000 ft^2	1.5 kW (DC)
1000 – 1499 ft^2	1.9 kW (DC)
1500 – 1999 ft^2	2.3 kW (DC)
2000 – 2499 ft^2	2.7 kW (DC)

2500 – 2999 ft^2	3.1 kW (DC)
3000 – 3499 ft^2	3.4 kW (DC)
3500 – 3999 ft^2	3.8 kW (DC)
4000 – 4499 ft^2	4.2 kW (DC)
≥ 4,500 ft^2	55% total TDV

Staff has reviewed the CEC model ordinance, and has used it as a template for the attached draft ordinance amending FMC Chapter 15.44 Fremont Energy Code to add new sections with requirements for the installation of photovoltaic solar energy systems in new residential construction. Alternations and exceptions have been added to the ordinance based on the Environmental Sustainability Commission's recommendations, allowing the Building Official to grant the substitution of a ground-mounted solar structure, roof-mounted wind turbine, ground-mounted wind turbine, or Green Building Code (CALGreen) "Tier 1" energy efficiency compliance if the installation of a solar PV system is found to be infeasible. The 2016 "CALGreen Cost Effectiveness Study" prepared by PG&E and its Codes & Standards Program consultant teams is attached for reference.

Alignment with California Statewide ZNE Goals

In 2007, the California Public Utilities Commission (CPUC) adopted the aspirational goals that all new residential construction in California will be zero net energy by 2020, and all new commercial construction in California will be zero net energy by 2030. The CPUC reiterated its commitment to these goals when it adopted the California Long Term Energy Efficiency Strategic Plan in 2008. Additionally, in 2007, the California Energy Commission (CEC) adopted the goal to achieve zero net energy building standards by 2020 for homes and 2030 for commercial buildings in its Integrated Energy Policy Report (IEPR), and reaffirmed that goal in its 2011 updated IEPR. The Zero Net Energy Building goals have also been supported in the California Energy Action Plan, the AB 32 (California Global Warming Solutions Act) Scoping Plan, the Governor's Clean Energy Jobs Plan, and the Clean Energy Futures Vision.

The 2016 solar cost effectiveness study demonstrates how local jurisdictions can require solar energy systems on single family and multifamily residential buildings to offset minimum building energy usage from the grid during the current 2016 California Building Standards Code cycle. To create a pathway to meet the 2020 ZNE goal for residential new construction by 2020, the solar reach code proposed by the CEC model ordinance represents a "glide path" to ZNE. The next building code update, the 2019 California Building Standards Code, is anticipated to require solar as a minimum Energy Code requirement in new residential construction when the code goes effect on January 1, 2020.

In alignment with these goals, staff recommends that City Council adopt the attached draft ordinance amending the FMC Chapter 15.44 Fremont Energy Code to require the installation of photovoltaic solar energy systems in new residential construction.

Effective Date

Local amendments to the CBSC must be filed with and approved by the California Building Standards Commission in the form of a letter documenting our changes. In addition, amendments specific to the California Energy Code require filing and approval by the

California Energy Commission before the ordinance can go into effect. The ordinance will apply to all projects where building permit applications are received after the effective date.

FISCAL IMPACT: The costs associated with the application and administration of the building standards in the City of Fremont are funded by user fees. The proposed code adoption would, therefore, not require any additional general fund contribution.

ENVIRONMENTAL REVIEW: The proposed actions are exempt from the requirements of the California Environmental Quality Act (CEQA) per CEQA Guidelines Section 15061(b)(3) in that it is not a project which has the potential for causing a significant effect on the environment.

ATTACHMENTS:

- PG&E 2016 Local PV Ordinance Cost Effectiveness Study
- PG&E 2016 CALGreen Cost Effectiveness Study
- Draft Ordinance- Energy Code Amendments
- Draft Ordinance- Fire Code Amendments

RECOMMENDATIONS:

1. Hold public hearing.
2. Find that the project is exempt from the California Environmental Quality Act (CEQA), pursuant to Guideline 15061(b)(3).
3. Waive full reading and introduce ordinances amending FMC section 15.35.150 of the Fremont Fire Code to include requirements for the installation of fire sprinklers in non-residential properties undergoing significant alterations and adding FMC sections 15.44.040 and 15.44.050 to the Fremont Energy Code to include requirements for the installation of photovoltaic solar energy systems in new residential construction.