

DOCKETED

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STAFF REPORT

DATE: April 9, 2019

TO: City Council

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

SUBJECT: Ordinance to adopt a Nonresidential and High-rise Residential Energy and Green Reach Code (Nonresidential Reach Code).

Recommendation

Introduce an Ordinance:

Enacting an energy efficiency and green “reach code” for nonresidential and high-rise residential projects that would require a 10% compliance margin per cost effectiveness study prepared by TRC, dated July 2017.

Codification of Davis Electric Vehicle (EV) Charging Plan previously adopted by Council resolution.

Requirement for installation of photovoltaics (PV) to achieve the lessor of approximately 80% offset of the building’s modelled annual electric load or 15 DC watts per sq. ft. of solar zone¹, as supported by cost effectiveness study prepared by TRC.

Adoption of the latest draft or publication of the International Code Council (ICC) Commissioning (Cx) Guideline to clarify and define the required commissioning process.

Requirement for a 120 volt receptacle at the most remote sink, measured from the water heater, for a new single family dwellings, additions and remodels to accommodate the future installation of an on-demand hot water recirculation pump.

Executive Summary

Davis has a history of leadership in energy efficiency and sustainability. In the 1970s, Davis adopted an energy code before the State of California had developed a statewide energy code. The City was also the first jurisdiction to adopt a green building ordinance in the region. The State has a goal of Zero Net Energy by 2030 for all new nonresidential buildings. On March 5, 2019, City Council approved a Resolution declaring a climate emergency and proposed mobilization efforts to restore a safe climate that included an acceleration of the carbon neutrality goal for the Davis community from 2050 to 2040. Approval of the proposed Ordinance would further these efforts.

In recent years, there has been uncertainty around green building requirements for projects seeking discretionary entitlements. This has resulted in project specific requirements being negotiated through the City commission process and ultimately at the dais. Approval of the proposed Ordinance would provide clarity and certainty of green building expectations for architects, developers, builders, staff, and the community. An understanding of these expectations at the beginning of a project planning process will have greater benefit for all rather than learning what the requirements are at the end of project processing. Adoption of the proposed Ordinance would also save time for the applicant, staff, and the Natural Resources Commission as project specific energy efficiency requirements will no longer need to be reviewed on an individual project basis.

In the absence of an approved “reach code” for nonresidential and high-rise residential, several project approvals have been conditioned to achieve Leadership in Energy and Environmental Design (LEED) Silver or more commonly, Gold equivalency. The LEED rating system is a proprietary system for rating buildings where LEED certification requires some pre-requisites, but the majority of the measures are selected from a self-chosen menu of sustainability choices. LEED Gold equivalency is not necessarily an efficient path for developers and applicants as compliance with two separate sustainability approaches (LEED and Code) can be challenging, confusing, and costly. The equivalency standard requires third party verification and because of the menu approach, there is a lack of certainty regarding what will ultimately be required to comply. The LEED menu approach results in some projects benefiting on the point scale by way of the project location and other means that do not have anything to do with energy efficiency. The City also has limited ability to verify compliance because the LEED process is not consistent with the State and local sustainability nor the energy code compliance process.

The proposed Ordinance is based on a comparison of the LEED rating system with CALGreen, the Energy Code and the Davis Municipal Code. In comparing the existing City requirements, including CALGreen Tier 1 and the Davis Municipal Code, a compliant design would result in approximately a LEED Silver level of sustainability. Rather than allow an arbitrary path from effectively a LEED Silver level equivalency to LEED Gold equivalency, in the proposed Ordinance, staff have included requirements for photovoltaics (PV) and enhanced energy efficiency (approximately 10% more efficient than code) beyond what is required by the Energy Code. The proposed Ordinance also codifies the EV charging requirements already approved by Council resolution. Finally, the proposed Ordinance recognizes the importance of energy systems to perform “as designed” by utilizing a defined commissioning process which is essential to optimize the efficiency of energy systems. CALGreen and the California Energy Code require commissioning but the process is not clearly defined. The International Code Council (ICC) has developed a Commissioning Guideline to be used by code officials and designers to clarify and provide consistency in the commissioning process. The proposed Ordinance requires projects to be consistent with the ICC G4 Guideline to Commissioning.

In an effort to get community feedback on the proposed reach code, the proposed Ordinance in both conceptual and final form was presented to the Natural Resources Commission three times over the last 16 months. The NRC unanimously supports the proposed Ordinance. Cool Davis is also supportive of the proposed Ordinance. The proposed Ordinance has been presented to the Chamber of Commerce on two occasions to solicit feedback and address concerns. The Chamber has voiced appreciation for the engagement on the matter and has taken a neutral position on the proposed Ordinance (Attachment 7).

The proposed Ordinance provides a meaningful and clear path to LEED Gold equivalency through using code requirements that City staff can review and verify without the costs of a third party. Approval of the proposed Ordinance would also relieve architects, builders, developers, and the community of drawn-out negotiations and related to uncertain green building requirements.

Fiscal Impact

The minor increase in staff time associated with reviewing plans, issuing building permits and conducting inspections will be recovered through plan check and permit fees.

City Council Goals

The proposed Ordinance is consistent with adopted City Council goal:

- Pursue environmental sustainability

Background and Analysis

There have been several projects in Davis approved with a condition to achieve Leadership in Energy and Environmental Design (LEED) Silver or Gold equivalency. The LEED rating system is a proprietary system for rating green buildings. LEED enjoys wide market recognition but there are several important considerations with this strategy for incorporating sustainable measures into new projects. First, Davis City plan review and inspection staff are not trained in the LEED rating system. Consequently, LEED equivalency requires third party verification which comes at an additional cost to the applicant and project. However, City staff are well trained in the California Green Building Standards Code (CALGreen) and California Energy Code compliance. Second, LEED is a rating system that does not have specific requirements other than the prerequisites included in the program. The design team is allowed to choose which measures are most easily achievable rather than which measures are most meaningful for the City. There is the potential for projects to earn significant credit based solely on the location rather than sustainable measures included in the project design. In many cases, it may be more beneficial to the City to require measures such as PV systems and EV charging systems rather than allow the project design team to select other less beneficial measures. Finally, since the LEED rating system and the other sustainable codes enforced in Davis (CALGreen and the California Energy Code) are not necessarily consistent with one another there are questions concerning how reasonable and fiscally appropriate it is to require compliance with two separate “green” approaches. Staff recommends adoption of sustainable measures selected by staff, in concurrence with the NRC that would be most beneficial to the City and would be essentially equivalent to LEED Gold.

The 2016 California Green Building Standards Code (CALGreen) contains checklists for residential and nonresidential projects. The checklists specify mandatory measures for all new construction. CALGreen also provides a list of additional “Tier 1” and “Tier 2” voluntary measures for designers and property owners who seek to design a more sustainable building and environment. CALGreen includes requirements for residential and commercial alterations, remodels, or additions. While most cities do not require it, the City of Davis has required Tier 1 compliance as mandatory, not optional. Adoption of Tier 1 energy efficiency measures requires California Energy Commission approval prior to implementation.

LEED certification equivalency would require a design that would achieve a minimum number of points to meet the Gold threshold. There are 110 possible points with a score of 60 to 79 points required for LEED Gold certification. There are seven (7) different categories from which an applicant could earn points. There is no defined energy efficiency required other than the prerequisite which is to conduct a building simulation demonstrating an improvement of 5% for new construction compared to the baseline performance rating; or Prescriptive compliance (ASHRAE 50% Advanced Energy Design Guide); or Prescriptive compliance (Advance Buildings™ Core Performance™ Guide). These standards fall well short of the California Energy Code requirements. There are only three (3) possible points for incorporating renewables into a project. PV is not a prerequisite for LEED Gold. Nor are EV Charging stations. Although LEED certification enjoys market recognition it does not necessarily achieve the level of sustainability desired. LEED and CALGreen are similar in some ways and inconsistent in others. It is staff’s opinion that it is unnecessary to require both CALGreen Tier 1 and LEED Gold compliance. CALGreen compliance is not optional; it is required by the State of California. The City has chosen to increase the level of compliance to Tier 1 for all measures and to require additional measures that are meaningful to the City.

The concept of developing LEED Gold equivalent building standards by utilizing existing Davis Municipal Code, California Energy Code in addition to the required and voluntary measures found in the CALGreen was first proposed to the NRC in November of 2017. Staff requested feedback from the NRC regarding sustainability measures that should be incorporated into projects under review. In a subsequent meeting, staff provided a comparison of LEED and the codes currently being enforced as well as other voluntary measures that could be incorporated into projects under review. The purpose of the comparison was to identify sustainable measures that are important to the City’s plan to be zero carbon by 2050. A LEED comparison (Attachment 2) lists all of the possible LEED measures that can be incorporated in to a

project. A comparison is made between LEED and the measures included in CALGreen, California Energy Code and the Davis Municipal Code. The current codes in effect including the CALGreen Tier 1 compliance get projects very close to the LEED Silver threshold of 50 points. Some specific measures such as PV, EV Charging, Enhanced Commissioning and increased energy compliance allow projects to be equivalent to LEED Gold without consideration of location.

The cost effectiveness study prepared by TRC (Attachment 3) shows that nonresidential buildings in all California climate zones have a market-ready and cost effective set of measures to achieve at least 10% energy performance higher than the California Energy Code requirements. Thus, the City has the required justification for adopting a 10% nonresidential reach code meeting the requirements of section 10-106 of the California Code of Regulations Title 24, Part 1.

The Zero Net Energy option was not shown to be cost effective in Davis (Climate Zone 12) at this time. Staff will continue to monitor the cost effectiveness of ZNE and additional energy efficiency measures as the market and technology allow. Table 1 below shows the cost effective compliance margins for all climate zones in California. The City of Davis is in Climate Zone 12.

TABLE 1 – Recommended Compliance Margins

Climate Zone	Cost Effective Compliance Margin	B/C Ratio		Recommended Reach Code Compliance Margin
		TDV Methodology	On-Bill Methodology	
1	15.7%	3.0	5.3	15%
2	12.8%	1.4	2.3	10%
3	15.5%	1.2	2.0	15%
4	13.1%	1.4	2.3	10%
5	15.9%	1.2	2.0	15%
6	14.7%	1.4	1.5	10%
7	15.6%	1.4	2.3	15%
8	13.7%	1.4	1.5	10%
9	12.6%	1.4	1.5	10%
10	11.6%	1.5	2.5	10%
11	11.0%	1.6	2.5	10%
12	11.8%	1.4	2.2	10%
13	10.8%	1.6	2.5	10%
14	11.0%	1.6	1.8	10%
15	10.4%	1.9	2.1	10%
16	12.8%	1.5	2.3	10%

Staff recommends continued compliance with the previously adopted California Green Buildings Standards Code. The previously adopted provisions include the following:

- All new construction, both residential and non-residential, would be required to comply with both the mandatory measures and the measures contained in Tier 1.
- All residential and non-residential remodels and additions would also be required to comply with both the mandatory measures and the measures contained in Tier 1, as applicable.

Photovoltaic Requirements

The proposed Ordinance would require PV sizing consistent with the methodology included in the cost effectiveness study also prepared by TRC (Attachment 4). The PV sizing calculations were developed such that the PV size would be the lessor of approximately 80% offset of the electricity used on site or 15 DC watts per sq. ft. of solar zone.

Codification of EV Ready

The proposed Ordinance would reinforce compliance with the EV Ready plan adopted by council resolution (Attachment 5). The tables below specify the number and type of charging stations required for new nonresidential and multifamily buildings. The proposed Ordinance will also augment the current CALGreen requirement regarding single family dwelling EV readiness by requiring #8 gauge conductors to be installed in the required conduit for a future EV charging station.

TABLE 2 - Non-Residential EV Charging Station Standards

Non-Residential Land Use Category	Required Parking Spaces	EV Chargers	Land use (From City Parking Code; City Code Section 40.25.090)
Retail	0-10	0	<ol style="list-style-type: none"> 1. Automobile or machinery sales and service garages 2. Banks, post offices, business and professional offices 3. Furniture and appliance stores, household equipment or furniture repair shop 4. Laundrettes 5. Restaurants, beer parlors, nightclubs, and cardrooms 6. Retail stores, shops, etc. 7. Rooming and lodging houses 8. Shopping center, neighborhood 9. Shopping center, community 10. Land uses where up to 50% of spaces serving employees.
	11-51	1	
	52-102	2	
	Every additional 50	+1	
Non-Retail	0-10	0	<ol style="list-style-type: none"> 1. Group care homes 2. Hospitals 3. Hotels and motor hotels, motels 4. Manufacturing plants, research or testing laboratories and bottling plants 5. Medical or dental clinics 6. Rest home, sanatorium, convalescent home
	11-26	1	
	27-42	2	
	Every additional 15	+1	

			or hospital 7. Wholesale establishments, warehouses 8. Land uses where more than 50% of spaces serving employees.
Destination	0-10	0	1. Bowling alleys 2. Churches, schools, day care centers and nursery schools 3. Dance halls and assembly halls without fixed seats, exhibition halls except assembly rooms in conjunction with auditorium 4. Funeral home, mortuaries 5. Sports arenas auditoriums, theaters, assembly halls
	11-36	1	
	37-62	2	
	Every additional 25	+1	

Notes:

1. All other non-modified Tier 1 standards for non-residential EV charging apply.
2. All required charging is Level 2 with the exception of non-retail (Workplace) charging, which can be satisfied by 50% level 1 chargers with 50% payment-ready level 2 chargers due to longer dwell times. Note: calculations for total number of chargers shall be rounded up and rounding shall favor Level 2 chargers.
3. The first two chargers placed at non-retail (Workplace) locations must be payment ready Level 2 with subsequent chargers optionally Level 1.
4. 50% of required non-retail (Workplace) chargers to be installed prior to issuance of Certificate of Occupancy if approved prior to January 1, 2020. Remaining required chargers do not have to be installed at time of construction but must be pre-wired and have adequate electrical panel capacity for each future charger. After January 1, 2020, all required chargers must be fully installed.
5. Chargers should be placed to serve multiple parking spaces – see design recommendations in Section 5 of Davis EV Charging Plan.
6. EV charging parking spaces shall be included in the required number of parking spaces per Article 40.25 of the City of Davis Zoning Ordinance. If space is available in a parking lot, additional EV charging spaces may be installed beyond the minimum number required subject to review and approval by the Department of Community Development and Sustainability.
7. Conversion of existing parking spaces for EV charging purposes shall be reviewed and approved by the Director of Community Development & Sustainability to assure a balance between full-size parking spaces, compact parking spaces and parking spaces for persons with disabilities.

TABLE - 3 Residential Standards

Development Type	Tier 1 Modifications	Notes
Single Family (1-3 units)	1. Single Family Residential development required to pre-install 8 Gauge wiring plus reserve room in electrical panel necessary to support Level 2 electric vehicle charging.	1. Addresses key barrier for adding Level 2 Home EV charger.
Multi-family (4 or more units)	1. Multi-family Residential development projects are required to provide: (1) Level 1 charging at 5% of all required parking spaces with a minimum of 2 parking spaces served, (2) Level 2 charging at 1% of all	1. Addresses key barrier for EV use in residential rental settings.

	<p>required parking spaces where more than 20 parking spaces are required with a minimum of 1 parking space served, (3) conduit adequate for Level 2 charging to serve or reasonably be extended in the future to 25% of all parking spaces, and (3) room in panel(s) and capacity to serve 20% of all parking spaces with Level 1 charging and 5% of all parking spaces with Level 2 charging. Notes: (1) properly located, a single charger can serve multiple parking spaces; (2) Reasonable future extension of conduit would not include the removal or trenching of hardscaped surfaces or areas where mature trees would be expected to establish (e.g. pavement, tree wells, etc.)</p>	
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Notes:

1. All other non-modified Tier 1 standards for residential EV charging apply.
2. Chargers in Multi-family residential settings should be placed to serve multiple parking spaces – see design recommendations in Section 5 of the Davis EV Charging Plan.
3. Level 1 in the context above is defined as a 20A 120V circuit and Level 2 is defined a 40A 208V/240V circuit
4. Level 1 is defined as a 120V hardwired EVSE not a household outlet.
5. Monitoring equipment to properly charge tenants is encouraged at multi-family locations

The two referenced studies provided by TRC show that the proposed energy reach code (10% compliance margin) and the proposed PV portion of the proposed Ordinance are cost effective in compliance with the Warren/ Alquist Act of 1974.

Commissioning Guideline

CALGreen includes basic commissioning² for nonresidential and high-rise residential projects over 10,000 sq. ft. The proposed Ordinance will include a requirement to adopt the International Code Council (ICC) G4 Commissioning Process Application. The ICC G4 is a set of commissioning guidelines to define and clarify the commissioning process (Attachment 6). Exceptions to the application of the commissioning requirement will be consistent with CALGreen. Exceptions include unconditioned warehouses and open parking garages.

120 Volt Receptacle Requirement

The most significant obstacle to the installation of a code compliant on-demand hot water recirculation pump is the installation of a 120-volt receptacle under the most remote sink. This is a simple and cost effective installation during construction but significantly more costly and time consuming as a retrofit. Installation of a 120-volt receptacle during construction or remodel will allow the occupant to install an on-demand pump without any plumbing or electrical modifications other than to install the necessary hoses to connect the pump. The purpose of the recirculation pump is to significantly reduce the amount of water wasted while waiting for hot water at a sink or shower. The recirculation pump fills the hot water system with hot water so that when the faucet is opened hot water is at the fixture with little or no water loss. The current energy code only allows on-demand pumps.

²2016 Nonresidential Compliance Manual section 9.3.1 solar zone must have a total area of no less than 15% of the total roof area.

²Basic commissioning is the process of verifying and documenting that the building and its systems and assemblies are planned, designed, installed, tested, operated and maintained to meet the owner's project requirements.

Commissions

On November 27, 2017 at a Natural Resources Commission meeting staff introduced the concept of utilizing existing codes and a reach code to replace LEED Gold equivalency as a standard for new construction. Staff presented a proposed reach code ordinance and sought feedback during two subsequent Natural Resources Commission meetings on June 26, 2018 and September 24, 2018. A final draft was presented to the Natural Resources Commission on November 26, 2018 for approval. The Commission recommended approval of the final version of the proposed reach code Ordinance with a 5-0 vote.

Outreach

Staff presented the proposed reach code Ordinance to the Davis Chamber of Commerce on two separate occasions. Local developers attended these meetings. The Chamber has submitted a letter expressing gratitude for staff outreach and stating a neutral position on the proposed Ordinance (Attachment 7). Cool Davis is supportive of the proposed Ordinance.

Attachment

1. Ordinance
2. LEED comparison
3. Nonresidential Cost Effectiveness Study (10% compliance margin)
4. PV System Cost Effectiveness Study
5. EV Readiness Plan adopted by council resolution
6. ICC Cx Guidelines (Draft)
7. Davis Chamber of Commerce Letter on Building Standards