

**DOCKETED**

<b>Docket Number:</b>	16-BSTD-07
<b>Project Title:</b>	Local Ordinance Applications - 2016 Standards
<b>TN #:</b>	227826
<b>Document Title:</b>	Carlsbad Ordinance Introduction to the City Council
<b>Description:</b>	This is the staff paper introducing the local ordinances to the City Council of Carlsbad, and includes summary descriptions of the measures included in the ordinances as well as their policy and regulatory context.
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<b>Organization:</b>	City of Carlsbad
<b>Submitter Role:</b>	Commission Staff
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CITY COUNCIL  
**Staff Report**

**Meeting Date:** Feb. 26, 2019  
**To:** Mayor and City Council  
**From:** Scott Chadwick, City Manager  
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**Subject:** Introduce an Energy Conservation Ordinance and Electric Vehicle Charging Infrastructure Ordinance.  
**Project Name:** Climate Action Plan Ordinances  
**Project No.:** MCA 17-0002 (PUB17Y-0013)

**Recommended Action**

Introduce ordinances amending Carlsbad Municipal Code, Title 18, Chapters 18.21 and 18.30 regarding energy efficiency, renewable energy, alternative water heating and electric vehicle charging infrastructure for residential and nonresidential new construction and major renovations.

**Executive Summary**

The city's Climate Action Plan (CAP) was adopted by the City Council on September 22, 2015. The CAP calls for the adoption of ordinances related to energy efficiency, renewable energy, alternative water heating and electric vehicle charging infrastructure. Implementation of these ordinances is intended to reduce greenhouse gas (GHG) emissions and assist in reaching the GHG reduction targets contained in the CAP. These ordinances amend Title 18 of the Carlsbad Municipal Code, and therefore require City Council approval. The energy-related ordinances also constitute amendments to the California Building Code Title 24, Parts 6 and 11, and must receive approval from the California Energy Commission (CEC) and be filed with the California Building Standards Commission (CBSC) prior to implementation. The electric vehicle charging ordinance amends the California Building Code Title 24, Part 11 (CALGreen) and will become effective 30 days after City Council adoption and after filing with the CBSC.

**Discussion**

The city's Climate Action Plan (CAP), adopted by the City Council on September 22, 2015, calls for the adoption of ordinances related to energy efficiency, renewable energy, alternative water heating and electric vehicle charging infrastructure. Implementation of these ordinances is intended to reduce greenhouse gas (GHG) emissions and assist in reaching GHG reduction targets contained in the CAP.

Generally, the ordinances are designed to reduce energy consumption, increase local production of renewable energy, reduce natural gas usage for water heating and reduce GHG

emissions from vehicles. The purpose, general requirements and applicability of each ordinance is described below. A summary of the specific ordinance requirements is contained in Exhibit 4.

### Energy Conservation Ordinances

*Energy Efficiency* – the purpose of the energy efficiency provisions is to increase the energy efficiency of residential and nonresidential buildings. This is accomplished through inclusion of cost-effective energy efficiency measures in new construction and/or major renovations.

Residential efficiency provisions apply to renovations of existing single-family and multi-family residential buildings with a building permit valuation of \$60,000 or more. This is the same threshold that triggers a local Coastal Development Permit. Building permit applicants can opt to perform a home energy assessment and be exempted from the ordinance requirements if they achieve a minimum energy efficiency score.

Nonresidential efficiency provisions apply to all new construction and major renovations adding more than 1,000 square feet of floor area or with a building permit valuation of \$200,000 or more.

*Photovoltaic (PV) Energy* – the purpose of the PV provisions is to increase the amount of locally generated renewable energy in nonresidential buildings. This is accomplished through the inclusion of cost-effective PV systems in new construction and major renovations.

The PV provisions apply to all new nonresidential construction and major renovations with a building permit valuation of \$1,000,000 or more that affect 75 percent or more of the existing floor area. It also applies to projects increasing the existing roof area by 2,000 or more square feet.

*Water Heating* – the purpose of the water heating provisions is to reduce the usage of natural gas for heating water in residential and nonresidential buildings. This is accomplished through the inclusion of cost-effective energy-efficient electric water heaters and/or solar water heating systems in all new residential and nonresidential construction. A separate residential water heating ordinance is proposed because its provisions rely on the 2019 Energy Code update, which will become effective on January 1, 2020. As such, the local ordinance amending residential water heating requirements will not become effective until January 1, 2020.

Electric Vehicle (EV) Ordinance – the purpose of the electric vehicle ordinance is to promote increased EV use by providing more opportunity for EV charging. This is accomplished through the inclusion of cost-effective EV charging infrastructure in new construction and major renovations.

The ordinance applies to all new residential and nonresidential construction. The ordinance also applies to major residential renovations, which are defined as: 1) one and two-family dwellings and townhouses with an attached garage, whose project includes an electrical service panel upgrade, or has a building permit valuation of \$60,000 or more; and 2) a multifamily project

(three or more dwellings) undergoing replacement/upgrade of major building systems, which includes 2,500 square feet or more of site work (grading, parking area replacement/addition, or landscaping), and has a building permit valuation of \$200,000 or more.

#### Cost-effectiveness

Public Resources Code Section 2502.1(h)2 requires that local jurisdictions perform and submit to the CEC a “cost effectiveness” study with supporting analysis showing that ordinances with additional energy saving measures are cost-effective. City staff partnered with the California Energy Codes and Standards team, as well as the Center for Sustainable Energy (CSE) and TRC Solutions, to prepare cost-effectiveness studies for the proposed energy conservation ordinance. All studies followed CEC analysis protocol and showed that the energy saving measures in the proposed ordinance are cost-effective based upon utility bill savings by the customer.

The city also worked with CSE and TRC to prepare a cost-effectiveness study for the EV ordinance, even though this is not required by state law. All studies are on file with the City Clerk’s Office and available for public review.

#### Fiscal Analysis

Cost associated with administering these ordinances will be recovered through plan check, permitting and inspection fees currently in effect. No fee modifications are proposed.

#### Next Steps

Upon adoption, the energy conservation ordinance (energy efficiency, PV, and water heating) will be submitted to the CEC for review and approval. The ordinance will become effective upon CEC approval and after filing with the CBSC. The residential water heating provisions will become effective on January 1, 2020, concurrent with the statewide 2019 Building Standards Code update. The EV ordinance will become effective 30 days after City Council adoption and filing with the CBSC.

#### Environmental Evaluation (CEQA)

The project was previously evaluated in the Final Program Environmental Impact Report (EIR) for the General Plan update (GPA 07-02), Climate Action Plan (SS 15-05) and other documents (EIR 13-02), dated September 22, 2015. The EIR evaluated the potential environmental effects of the implementation of the Climate Action Plan including the adoption and enforcement of energy conservation and electric vehicle charging infrastructure ordinances. This project is within the scope of the Final Program EIR 13-02 and no further California Environmental Quality Act (CEQA) compliance is required.

#### Public Notification

The city conducted a variety of public outreach efforts for the CAP ordinances, including: individual and group stakeholder meetings; presentations at the Carlsbad Chamber of Commerce, Carlsbad Sustainability Coalition and Building Industry Association (BIA); press releases and a news article in Carlsbad Business Journal; and distribution of fact sheets through emails to interested parties and displays at the Development Services front counter. The draft ordinances were posted on the city’s website for public review and comment.

This item was noticed in accordance with the Ralph M. Brown Act and was available for public viewing and review at least 72 hours prior to scheduled meeting date.

**Exhibits**

1. Ordinance amending Title 18, Chapters 18.21 and 18.30 for energy efficiency, PV systems and nonresidential water heating systems
2. Ordinance amending Title 18, Chapter 18.30 for residential water heating systems
3. Ordinance amending Title 18, Chapter 18.21 for electric vehicle charging infrastructure
4. Summary of ordinance applicability and requirements
5. Proposed text changes to Carlsbad Municipal Code Chapters 18.21 and 18.30 for energy efficiency, photovoltaic and alternative water heating systems
6. Proposed text changes to Carlsbad Municipal Code Chapter 18.21 for electric vehicle infrastructure



## SUMMARY OF PROPOSED ENERGY CONSERVATION AND ELECTRIC VEHICLE CHARGING INFRASTRUCTURE ORDINANCES

The city’s Climate Action Plan (CAP) calls for the adoption of ordinances related to energy efficiency, renewable energy, alternative water heating and electric vehicle charging infrastructure. Implementation of these ordinances is intended to reduce greenhouse gas (GHG) emissions and assist in reaching the GHG reduction targets contained in the CAP. Below is a summary of the proposed ordinances, separated by topic and type of construction.

### Energy Efficiency – Residential

**Applicability:** All renovations of existing single-family and multi-family residential buildings with a building permit valuation of \$60,000 or more.

**Requirements:** See Table 1 below.

*Table 1 - Existing Residential Energy Efficiency Required Measures by Building Type and Vintage*

Measure	Existing Conditions	Requirement	Single Family Vintage	Multi-family Vintage
Heating, Ventilation and Cooling Ducts	Insulation with a thermal resistance (R-value) greater than or equal to R-2.1 and ≥30% leakage (≥25% leakage for multi-family units)	2016 Title 24 Section 150.2(b)1E without verification by a certified Home Energy Rating System (HERS) Rater.	Pre-1978	Pre-1978
Attic Insulation	Insulation with an R-value of greater than or equal to R-5, vented attic	Insulation with an R-value of R-38	Pre-1978	Pre-1991
Cool Roof	Asphalt shingles, dark (project scope includes replacement of roof)	Aged solar reflectance greater than or equal to 0.25 Thermal emittance greater than or equal to 0.75	Pre-1978	Pre-1991
Water Heating Package	40-gal uninsulated tank No pipe insulation No low-flow fixtures	Water heater blanket with an R-value of greater than or equal to R-6 Hot water pipe insulation greater than or equal to 3/4 inch thick Low-Flow Fixtures with rated flow rates no more than CALGreen requirements	1978 and newer	1991 and newer
Lighting Package	Screw-in (A-base) incandescent and halogen lamps	Screw-in LED lamps and manual-on automatic-off vacancy sensors that meet Title 24 Section 110.9(b)4.C	1978 and newer	1991 and newer

Exceptions<sup>1</sup>: The requirement for inclusion of energy efficiency measures does not apply to residential buildings that receive a rating of seven (7) or higher on the U.S. Department of Energy's Home Energy Score rating system based upon an assessment by a Home Energy Score Certified Assessor, to the satisfaction of the Building Official.

## Energy Efficiency – Non-residential

Applicability: All new non-residential buildings and renovations to existing non-residential buildings with a building permit valuation of \$200,000 or greater or add 1,000 or more square feet.

Requirements: Development must meet the energy standards of CALGreen (Title 24, Part 11 of the California Building Code) Voluntary Tier 1.

Exceptions: Some of the proposed Energy Conservation Ordinance is more restrictive than CALGreen Voluntary Tier 1, in which case the more restrictive ordinance shall apply. Specifically:

- 1) all new non-residential construction shall follow the city's water heating ordinance requirements;
- 2) all new non-residential construction and renovations with a building permit valuation of \$1,000,000 or higher that affect 75 percent or more of the existing floor area; OR renovations that increase roof area by greater than or equal to 2,000 square feet shall follow the city's photovoltaic ordinance requirements.

## Photovoltaic – Non-residential

Applicability: All new non-residential buildings and renovations to existing non-residential buildings with a building permit valuation of \$1,000,000 or higher that affect 75 percent or more of the existing floor area; OR renovations that increase roof area by greater than or equal to 2,000 square feet.

Requirements: Development must include a photovoltaic (PV) system that meets one of the following minimum size requirements:

- 1) offsets 80 percent of the building's electrical demand;
- 2) generates a minimum of 15-kilowatts per 10,000 square feet of gross floor area; or

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<sup>1</sup> Exceptions described in this summary are proposed with the local ordinance amendments and may modify, or be in addition to, exceptions contained in existing statewide codes (such as for technical infeasibility or unreasonable hardship).

- 3) generates a minimum of 5-kilowatts for buildings under 10,000 square feet of gross floor area.

- Exceptions:
- 1) The existence of practical challenges to effective PV installation, such as building site location, limited rooftop availability, or shading from nearby structures, topography or vegetation. In these cases, the applicant may be responsible for alternative energy conservation measures to comply with the California Environmental Quality Act.
  - 2) The building satisfies the purpose and intent of the PV system requirement using alternate on-site renewable generation systems such as wind energy systems.

## **Water Heating – Low-rise Residential**

Applicability: All new residential buildings with three or fewer habitable stories.

- Requirements:
- 1) Development must include a water heating system that derives at least 60 percent of its energy from on-site solar energy or recovered energy;
  - 2) Development must include a water heating system meeting one of the following requirements:
    - a) contains heat pump water heater(s) or other form of electric water heating system(s), that meets California Energy Code (Title 24, Part) standards and is paired with a greater than or equal to 300W PV system;
    - b) contains a solar water heating system that uses OG-300 certified collectors and provides a 0.6 solar fraction or includes collectors covering 40 or more square feet.

Exceptions: If on-site energy or recovered energy is economically infeasible.

*Note: The residential water heating ordinance will be implemented when the 2019 building code (Title 24) standards are adopted. The 2019 standards will include a requirement for residential photovoltaic systems, which will support the water heating measures identified in the ordinance.*

## **Water Heating – High-rise Residential and Hotel/Motel**

Applicability: All new residential buildings with four or more habitable stories and all new hotel/motel buildings.



Requirements:

- 1) High-rise residential and hotel/motel development must include a water heating system meeting one of the following requirements:
  - a) contains heat pump water heater(s) or other form of electric water heating system(s), that meets California Energy Code (Title 24, Part 6) standards;
  - b) contains a solar water heating system that uses OG-100 certified collectors and provides a 0.6 solar fraction or includes collectors covering 40 or more square feet.
- 2) Buildings serving multiple units with a central water-heating system can include a gas or propane water heating system provided they include a recirculation system and a solar water heating system.

**Water Heating – Non-residential**

Applicability: All new non-residential buildings.

Requirements: Development must include a water heating system that derives at least 40 percent of its energy from on-site solar energy or recovered energy and meets one of the following requirements:

- 1) contains heat pump water heater(s), tankless electric resistance, or other form of electric water heating system(s) that meet Title 24 standards;
- 2) contains a solar water heating system that provides a 0.4 solar fraction and uses OG-100 certified collectors.

Exceptions: If on-site energy or recovered energy is economically infeasible.

**Electric Vehicle Charging Infrastructure - Residential**

Applicability: All new residential buildings and major renovations to existing residential buildings, as defined in Table 2 below.

Requirements: Provide electric vehicle (EV) spaces and EV charging infrastructure in accordance with Table 2 below.

Table 2 – Residential EV Charging Infrastructure by Project Type

Project Type	Requirement
New Residential Construction*	One- and two-family dwellings and townhouses with attached private garages Must have one parking space per dwelling unit be EV supply equipment ready.  Multi-family projects (three or more dwellings) Must have 10 percent of parking spaces, or a minimum of one space, be EV supply equipment capable. 50 percent of the EV capable spaces, or a minimum of one space, must have EV supply equipment installed.
Residential Additions and Alterations	One- and two-family dwellings and townhouses with attached private garages whose project includes an electrical service panel upgrade <b>or</b> a permit valuation $\geq$ \$60,000 Must have one parking space per dwelling unit be EV supply equipment ready.  Multifamily project (three or more dwelling units) performing a major renovation <sup>2</sup> <b>and</b> has a permit valuation of $\geq$ \$200,000 Must have 10 percent of parking spaces, or a minimum of one space, be EV supply equipment capable. 50 percent of the EV capable spaces, or a minimum of one space, must have EV supply equipment installed.

\*For all residential projects where common or visitor use parking is provided, at least one space shall be equipped with an EV charging station and shall be available for use by all residents.

**Exceptions:** Projects involving one- and two-family dwellings with a permit valuation greater than or equal to \$60,000 but do not include an electrical service panel upgrade must meet these requirements to the maximum extent that does not trigger a panel upgrade. Also, requirement may be reduced if it adds more than \$400 cost per parking space for utility-side infrastructure upgrades.

## Electric Vehicle Charging Infrastructure – Non-residential

**Applicability:** All new non-residential developments.

**Requirements:** Provide EV spaces and EV charging infrastructure in accordance with Table 3 below.

<sup>2</sup> Major Renovations: Renovations where interior finishes are removed and significant site work and upgrades to structural and mechanical, electrical and/or plumbing systems are proposed. Significant site work as used herein means site alterations that: require a grading permit pursuant to Carlsbad Municipal Code Chapter 15.16; rehabilitate or install 2,500 square feet or more of landscaping; or repave, replace or add 2,500 square feet or more of vehicle parking and drive area.

Table 3 – Non-residential EV Spaces and Charging Infrastructure

Total Number of Parking Spaces	Number of Required EV Spaces	Number of Required EV Charging Infrastructure Installed Spaces
0-9	1	1
10-25	2	1
26-50	4	2
51-75	6	3
76-100	9	5
101-150	12	6
151-200	17	9
201 and over	10 percent of total parking spaces	50 percent of required EV spaces

Exceptions: No locally-amended exceptions proposed; statewide infeasibility exceptions would apply.

**PROPOSED TEXT CHANGES TO  
CARLSBAD MUNICIPAL CODE CHAPTERS 18.21 AND 18.30  
ENERGY EFFICIENCY, PHOTOVOLTAIC AND ALTERNATIVE WATER HEATING SYSTEMS**

**Legend to proposed text amendments:**

1. Existing Carlsbad Municipal Code (CMC) language appears as regular upright text.
2. New CMC language is underlined.
3. Excerpts from the California Green Building Standards Code (CALGreen) and California Energy Code added to the CMC are shown in *italics*.
4. Carlsbad additions to CALGreen and Energy Code are underlined, and deletions are shown in ~~strikeout~~.

**Chapter 18.21 List of Sections**

Amend Chapter 18.21 List of Sections to reference new sections as follows:

**Sections:**

- 18.21.010**      **Adoption.**  
**18.21.020**      **Building official designated.**  
**18.21.030**      **Permit fees.**  
**18.21.155**      **California Green Building Standards Code Appendix A5 adopted in part and amended as mandatory requirements – Energy efficiency.**

**Section 18.21.010**

Amend Section 18.21.010 as follows:

**18.21.010 Adoption.**

The 2016 California Green Building Standards Code copyrighted by the California Building Standards Commission, together with those amendments, exceptions, additions and deletions incorporated into this chapter, is adopted by reference as the Green Building Standards Code of the City of Carlsbad.

**Section 18.21.155**

Add Section 18.21.155 as follows:

**18.21.155**      **California Green Building Standards Code Appendix A5 adopted in part and amended as mandatory requirements – Energy efficiency.**

California Green Building Standards Code Appendix A5 - Nonresidential Voluntary Measures, Division A5.2 – Energy Efficiency, Sections A5.201, A5.202, Subsections A5.203.1.1 (Tier 1 Prerequisites) through A5.203.1.2.1 Tier 1, and Sections A5.211 through A5.213, are adopted and amended herein as mandatory requirements for construction of nonresidential, high-rise

residential, hotels/motels, and alterations thereto having a building permit valuation of at least \$200,000 or additions of at least 1,000 square feet.

A. Section A5.203.1.1.2 of the California Green Building Standards Code is amended to read as follows:

**A5.203.1.1.2 Service water heating in restaurants.** ~~Newly constructed restaurants shall comply with California Energy Code Section 140.58, 000 square feet or greater and with service water heaters rated 75,000 Btu/h or greater shall install a solar water heating system with a minimum solar savings fraction of 0.15.~~

**Exceptions:**

- ~~1. Buildings with a natural gas service water heater with a minimum of 95 percent thermal efficiency.~~
- ~~2. Buildings where greater than 75 percent of the total roof area has annual solar access that is less than 70 percent. Solar access is the ratio of solar insolation, including shade, to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in the determination of annual solar access.~~

B. Section A5.211 of the California Green Building Standards Code is amended to read as follows:

**A5.211.1 On-site renewable energy.** Use on-site renewable energy sources such as solar, wind, geothermal, low-impact hydro, biomass and bio-gas for at least 1 percent of the electric power calculated as the product of the building service voltage and the amperage specified by the electrical service overcurrent protection device rating or 1 kW, (whichever is greater), in addition to the electrical demand required to meet 1 percent of the natural gas and propane use. The building project's electrical service overcurrent protection device rating shall be calculated in accordance with the 2016 California Electrical Code. Natural gas or propane use is calculated in accordance with the 2016 California Plumbing Code.

**A5.211.1.1 Documentation.** Using a calculation method approved by the California Energy Commission, calculate the renewable on-site energy system to meet the requirements of Section A5.211.1, expressed in kW. Factor in net-metering, if offered by local utility, on an annual basis.

**A5.211.3 Green power.** If offered by local utility provider, participate in a renewable energy portfolio program that provides a minimum of 50 percent electrical power from renewable sources. Maintain documentation through utility billings.

Exception to A5.211.1, A5.211.1.1 and A5.211.3: All new nonresidential, high-rise residential, and hotel/motel buildings, and alterations thereto having a building permit valuation of at least \$1,000,000 and affecting at least 75 percent of existing floor area, or alterations that increase roof size by at least 2,000 square feet, shall instead comply with California Energy Code Section 120.10.

**Chapter 18.30 List of Sections**

Amend Chapter 18.30 List of Sections to reference new sections as follows:

**Sections:**

- 18.30.010** Adoption.
- 18.30.020** Purpose and application.
- 18.30.030** Building official designated.
- 18.30.040** Solar alternative design provisions required.
- 18.30.050** Permit fees.
- 18.30.110** **California Energy Code Subchapter 1 amended - Definitions**
- 18.30.130** **California Energy Code Subchapter 3 amended – Nonresidential photovoltaic system required.**
- 18.30.150** **California Energy Code Subchapters 3 and 5 amended – Nonresidential water heating requirements.**
- 18.30.170** **California Energy Code Subchapters 7 and 8 amended – Residential water heating requirements.**
- 18.30.190** **California Energy Code Subchapter 9 amended – Energy efficiency in existing residential buildings.**

**Section 18.30.110 California Energy Code Subchapter 1 amended - Definitions**

Add Section 18.30.110 as follows:

**18.30.110** **California Energy Code Subchapter 1 amended – Definitions.**

Section 100.1(b) is amended by adding the following definition:

*SOLAR ELECTRIC GENERATION SYSTEM or PHOTOVOLTAIC SYSTEM is the complete set of all components for converting sunlight into electricity through the photovoltaic process, including the array of panels, inverter(s) and the balance of system components required to enable the system to effectively deliver power to reduce a building's consumption of electricity from the utility grid.*

**Section 18.30.130 California Energy Code Subchapter 3 amended – Nonresidential photovoltaic system required**

Add Section 18.30.130 as follows:

**18.30.130** **California Energy Code Subchapter 3 amended – Nonresidential photovoltaic system required.**

Section 120.10 is added to the California Energy Code as follows:

**SECTION 120.10**  
**NONRESIDENTIAL PHOTOVOLTAIC SYSTEM REQUIRED**

All new nonresidential, high-rise residential, and hotel/motel buildings shall comply with the requirements of Section 120.10(a) or 120.10(b). Additions to existing nonresidential, high-rise residential, and hotel/motel buildings where the total roof area is increased by at least 2,000 square feet, and alterations to existing nonresidential, high-rise residential, and hotel/motel buildings with a permit valuation of at least \$1,000,000 that affect at least 75 percent of the gross floor area shall also comply with the requirements of Section 120.10(a) or (b).

The required installation of a photovoltaic (PV) system shall be sized according to one of the following methods:

(a) Based on gross floor area.

1. Buildings with greater than or equal to 10,000 square feet of gross floor area shall install a minimum PV system sized at 15 kilowatts direct current (kWdc) per 10,000 square feet of gross floor area.

**Note to Section 120.10(a)1:** PV system size = 15 kWdc X (Gross Floor Area / 10,000 sq. ft.), where the building size factor shall be rounded to the nearest tenth and the resulting product shall be rounded to the nearest whole number. For example, an applicant with a 126,800 square foot building shall install a minimum 191 kilowatt (kWdc) PV system.

2. Buildings under 10,000 square feet of gross floor area shall install a minimum 5-kilowatt (kWdc) PV system.

**Note to Section 120.10(a)2:** Applicants are encouraged to right-size the PV system based on the building's electrical demand to improve the system's cost effectiveness.

- (b) Based on Time Dependent Valuation (TDV). Install a solar PV system that will offset 80 percent of the building's TDV energy on an annual basis. The system sizing requirement shall be based upon total building TDV energy use including both conditioned and unconditioned space and calculated using modeling software or other methods approved by the Building Official.

**Exception 1 to Section 120.10:** The Building Official may waive or reduce, by the maximum extent necessary, the provisions of this Section if the Official determines there are sufficient practical challenges to make satisfaction of the requirements infeasible. Practical challenges may be a result of the building site location, limited



rooftop availability, or shading from nearby structures, topography or vegetation. The applicant is responsible for demonstrating requirement infeasibility when applying for an exemption.

**Exception 2 to Section 120.10:** The Building Official may waive or reduce, by the maximum extent necessary, the provisions of this Section if the Official determines the building has satisfied the purpose and intent of this provision through the use of alternate on-site renewable generation systems such as wind energy systems.

**Section 18.30.150 California Energy Code Subchapters 3 and 5 amended – Nonresidential water heating requirements**

Add Section 18.30.150 as follows:

**18.30.150 California Energy Code Subchapters 3 and 5 amended – Nonresidential water heating requirements.**

A. Section 120.11 is added to the California Energy Code as follows:

**SECTION 120.11**

**NONRESIDENTIAL MANDATORY REQUIREMENTS FOR SERVICE WATER HEATING SYSTEMS**

Any newly constructed nonresidential building shall derive its service water heating from a system that provides at least 40 percent of the energy needed for service water heating from on-site solar energy or recovered energy. Solar energy includes solar photovoltaics and solar-water heating systems.

**Exception to Section 120.11:** Buildings for which the Building Official has determined that service water heating from on-site solar energy or recovered energy is economically or physically infeasible. Applicant is responsible for demonstrating requirement infeasibility when applying for an exemption.

B. Section 140.5 of the California Energy Code is amended to read as follows:

**SECTION 140.5**

**PRESCRIPTIVE REQUIREMENTS FOR SERVICE WATER HEATING SYSTEMS**

(a) **Nonresidential occupancies.** A service water-heating system installed in a nonresidential building ~~complies with this section if it complies shall comply~~ with the applicable requirements of Sections 110.1, 110.3 ~~and~~, 120.3, and 120.11. In addition, a service water-heating system shall meet the requirements of 1, 2, or 3 below:

1. A heat pump water heater. The storage tank shall be located in a conditioned space.

2. An electric resistance water heater.
3. A solar water-heating system with a minimum solar savings fraction of 0.40. Solar water-heating systems and collectors shall be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the Executive Director.

(b) **High-rise residential and Hotel/Motel occupancies.** A service water heating system installed in a high-rise residential or hotel/motel building ~~complies with this section if it meets the requirements of Section 150.1(c)8.~~ shall meet the requirements of either 1, 2, or 3. For recirculation distribution systems serving individual dwelling units, only Demand Recirculation Systems with manual on/off control as specified in the Reference Appendix RA4.4.9 shall be used:

1. For systems serving individual dwelling units, the water heating system shall meet the requirement of either A, B, or C:
  - A. A single heat pump water heater. The storage tank shall be located in the garage or conditioned space. In addition, one of the following:
    - i. A compact hot water distribution system; or
    - ii. A photovoltaic system of 0.3 kWdc larger than the requirement specified in Section 120.10.
  - B. A single heat pump water heater that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher. The storage tank shall be located in the garage or conditioned space.
  - C. A solar water-heating system meeting the installation criteria specified in Reference Residential Appendix RA4 and either a minimum solar savings fraction of 0.60 or a minimum 40 square feet of collectors.
2. For systems serving multiple dwelling units, a central water-heating system that includes the following components shall be installed:
  - A. Gas or propane water heating system; and
  - B. A recirculation system that meets the requirements of Sections 110.3(c)2 and 110.3(c)5, includes two or more separate recirculation loops serving separate dwelling units, and is capable of automatically controlling the recirculation pump operation based on measurement of hot water demand and hot water return temperature; and

**EXCEPTION to Section 140.5(b)2B: Buildings with eight or fewer dwelling units may use a single recirculation loop.**

**C. A solar water-heating system meeting the installation criteria specified in Reference Residential Appendix RA4 and with a minimum solar savings fraction of either a or b below:**

**i. A minimum solar savings fraction of 0.60 or a minimum of 40 square feet of collectors; or**

**ii. A minimum solar savings fraction of 0.40. In addition, a drain water heat recovery system shall be installed.**

**3. A water-heating system serving multiple dwelling units determined by the Executive Director to use no more energy than the one specified in subsection B above.**

**Section 18.30.170 California Energy Code Subchapters 7 and 8 amended – Residential water heating requirements**  
**NOTE: Amends 2019 California Energy Code**

Add Section 18.30.170 as follows:

**18.30.170 California Energy Code Subchapters 7 and 8 amended – Residential water heating requirements.**

**A. Section 150.0(n) of the California Energy Code is amended to read as follows:**

**SECTION 150.0**  
**MANDATORY FEATURES AND DEVICES**

**(n) Water Heating System.**

1. Systems using gas or propane water heaters to serve individual dwelling units shall include the following components:
  - A. A dedicated 125 volt, 20 amp electrical receptacle that is connected to the electric panel with a 120/240 volt 3 conductor, 10 AWG copper branch circuit within 3 feet from the water heater and accessible to the water heater with no obstructions. In addition, all of the following:
    - i. Both ends of the unused conductor shall be labeled with the word "spare" and be electrically isolated; and

- ii. *A reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit in A above and labeled with the words "Future 240V Use"; and*
- B. *A Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; and*
- C. *A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance, and*
- D. *A gas supply line with a capacity of at least 200,000 Btu/hr.*
- 2. *Water heating recirculation loops serving multiple dwelling units shall meet the requirements of Section 110.3(c)5.*
- 3. *Solar water-heating systems and collectors shall be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the Executive Director.*
- 4. *Instantaneous water heaters with an input rating greater than 6.8 kBTU/hr (2kW) shall meet the requirements of Section 110.3(c)7.*
- 5. *Any newly constructed residential building shall derive its service water heating from a system that provides at least 60 percent of the energy needed for service water heating from on-site solar energy or recovered energy. Solar energy includes solar photovoltaics and solar-water heating systems.*

**EXCEPTION to Section 150.0(n)5:** *Buildings for which the Building Official has determined that service water heating from on-site solar energy or recovered energy is economically or physically infeasible. Applicant is responsible for demonstrating requirement infeasibility when applying for an exemption*

B. Section 150.1(c)8 of the California Energy Code is amended to read as follows:

**SECTION 150.1**

**PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR LOW-RISE RESIDENTIAL BUILDINGS**

- 8. **Domestic Water-Heating Systems.** *Water-heating systems shall meet the requirements of either A, B, or C. For recirculation distribution systems serving individual dwelling units, only Demand Recirculation Systems with manual on/off control as specified in the Reference Appendix RA4.4.9 shall be used:*

- A. For systems serving individual dwelling units, the water heating system shall meet the requirement of either i, ii, or iii; ~~iv, or v~~:
- ~~i. One or more gas or propane instantaneous water heater with an input of 200,000 Btu per hour or less and no storage tank.~~
  - ~~ii. A single gas or propane storage type water heater with an input of 75,000 Btu per hour or less, rated volume less than or equal to 55 gallons and that meets the requirements of Sections 110.1 and 110.3. The dwelling unit shall have installed fenestration products with a weighted average U factor no greater than 0.24, and in addition one of the following shall be installed:
 
    - ~~a. A compact hot water distribution system that is field verified as specified in the Reference Appendix RA4.4.16; or~~
    - ~~b. A drain water heat recovery system that is field verified as specified in the Reference Appendix RA3.6.9.~~~~
  - ~~iii. A single gas or propane storage type water heater with an input of 75,000 Btu per hour or less, rated volume of more than 55 gallons.~~
  - iv.i. A single heat pump water heater. The storage tank shall be located in the garage or conditioned space. In addition, one of the following:
    - a. A compact hot water distribution system as specified in the Reference Appendix RA4.4.6 and a drain water heat recovery system that is field verified as specified in the Reference Appendix RA3.6.9; or
    - ~~b. For Climate Zones 2 through 15, a photovoltaic system capacity of 0.3 kWdc larger than the requirement specified in Section 150.1(c)14; or~~
    - ~~c.b. For Climate Zones 1 and 16, a photovoltaic system capacity of 1.1 kWdc larger than the requirement specified in Section 150.1(c)14.~~
  - ii. A single heat pump water heater that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher. The storage tank shall be located in the garage or conditioned space. ~~In addition, for Climate Zones 1 and 16, a photovoltaic system capacity of 0.3 kWdc larger than the requirement specified in Section 150.1(c)14 or a compact hot water distribution system as specified in the Reference Appendix RA4.4.6.~~

~~iv.iii.~~ A solar water-heating system meeting the installation criteria specified in Reference Residential Appendix RA4 and either a minimum solar savings fraction of 0.60 or a minimum 40 square feet of collectors.

- B. For systems serving multiple dwelling units, a central water-heating system that includes the following components shall be installed:
- i. Gas or propane water heating system; and
  - ii. A recirculation system that meets the requirements of Sections 110.3(c)2 and 110.3(c)5, includes two or more separate recirculation loops serving separate dwelling units, and is capable of automatically controlling the recirculation pump operation based on measurement of hot water demand and hot water return temperature; and

**EXCEPTION to Section 150.1(c)8Bii:** Buildings with eight or fewer dwelling units may use a single recirculation loop.

- iii. A solar water-heating system meeting the installation criteria specified in Reference Residential Appendix RA4 and with a minimum solar savings fraction of either a or b below:
    - a. A minimum solar savings fraction of ~~0.20-60 in Climate Zones 1 through 9~~ or a minimum ~~solar savings fraction of 0.35 in Climate Zones 10 through 16~~ of 40 square feet of collectors; or
    - b. A minimum solar savings fraction of ~~0.15-40 in Climate Zones 1 through 9~~ or a ~~minimum solar savings fraction of 0.30 in Climate Zones 10 through 16~~. In addition, a drain water heat recovery system that is field verified as specified in the Reference Appendix RA3.6.9.
- C. A water-heating system serving multiple dwelling units determined by the Executive Director to use no more energy than the one specified in subsection B above.

Section 18.30.190 California Energy Code Subchapter 9 amended – Energy efficiency in existing residential buildings

Add Section 18.30.190 as follows:

**18.30.190 California Energy Code Section Subchapter 9 amended - Energy efficiency in existing residential buildings.**

Section 150.2 of the California Energy Code is amended to add paragraph (d) as follows:

(d) All additions and alterations of residential buildings with a building permit valuation of \$60,000 or higher shall include one of the following energy efficiency measures:

1. Additions and alterations of single family residential buildings built before 1978 shall include one of the following:

A. Duct sealing pursuant to 2016 Title 24 Section 150.2(b)1E without verification by a Home Energy Rating System (HERS) rater. All exceptions as stated in 2016 Title 24 Section 150.2(b)1E are allowed. Projects that require duct sealing as part of an HVAC alteration or replacement must meet all of the requirements of Title 24, Part 6, including HERS rater verification.

B. Attic insulation with a minimum of R-38 rating. Buildings without vented attic spaces and buildings with existing attic insulation levels greater than R-5 are exempt from this attic insulation energy efficiency measure.

C. Cool roof with an aged solar reflectance of greater than or equal to 0.25 and a thermal emittance of greater than or equal to 0.75. All exceptions as stated in 2016 Title 24 Section 150.2(b)1Hi for steep slope roofs and 150.2(b)1Hii for low slope roofs are allowed. Only areas of roof that are to be re-roofed subject to the cool roof upgrade. Projects that are not installing a new roof as part of the scope are exempt from this cool roof energy efficiency measure.

2. Additions and alterations of single family residential buildings built in 1978 or after shall include one of the following:

A. A lighting package consisting of:

i. replacement all interior and exterior screw-in (A-base) incandescent and halogen lamps with screw-in LED lamps; and,

ii. installation of manual-on automatic-off vacancy sensors that meet Title 24 Section 110.9(b)4C in all bathrooms, bedrooms, offices, laundry rooms, utility rooms, and garages. Spaces which already include vacancy sensors, motions sensors, or dimmers do not need to install new Title 24 Section 110.9(b)4C sensors.

B. A water heating package consisting of:

- i. addition of exterior insulation meeting a minimum of R-6 to storage water heaters 20 gallons or larger in size, except if insulation installation would void the water heater warranty; and,
  - ii. insulation of all accessible hot water pipes with pipe insulation a minimum of 0.75 inches in thickness. This includes insulating the supply pipe leaving the water heater, piping to faucets underneath sinks, and accessible pipes in attic spaces and crawlspaces; and,
  - iii. upgrading of fitting in sinks and showers to meet current CALGreen (Title 24, Part 11 of the California Building Code) standards, except for fixtures with rated flow rates no more than 10 percent greater than current CALGreen standards.
3. Additions and alterations of multi-family residential buildings built before 1978 shall include attic insulation with a minimum of R-38 rating. Buildings without vented attic spaces and buildings with existing attic insulation levels greater than R-5 are exempt from this attic insulation energy efficiency measure.
4. Additions and alterations of multi-family residential buildings built between 1978 and 1990 shall include one of the following:
  - A. Duct sealing pursuant to 2016 Title 24 Section 150.2(b)1E without verification by a HERS rater. All exceptions as stated in 2016 Title 24 Section 150.2(b)1E are allowed. Projects that require duct sealing as part of an HVAC alteration or replacement must meet all of the requirements of Title 24, Part 6, including HERS rater verification.
  - B. Attic insulation with a minimum of R-38 rating. Buildings without vented attic spaces and buildings with existing attic insulation levels greater than R-5 are exempt from this attic insulation energy efficiency measure.
  - C. Cool roof with an aged solar reflectance of greater than or equal to 0.25 and a thermal emittance of greater than or equal to 0.75. All exceptions as stated in 2016 Title 24 Section 150.2(b)1Hi for steep slope roofs and 150.2(b)1Hii for low slope roofs are allowed. Only areas of roof that are to be re-roofed are subject to the cool roof upgrade. Projects that are not installing a new roof as part of the scope are exempt from this cool roof energy efficiency measure.
5. Additions and alterations of multi-family residential buildings built after 1991 shall include one of the following:
  - A. A lighting package consisting of:
    - i. replacement all interior and exterior screw-in (A-base) incandescent and halogen lamps with screw-in LED lamps; and,



ii. installation of manual-on automatic-off vacancy sensors that meet Title 24 Section 110.9(b)4C in all bathrooms, bedrooms, offices, laundry rooms, utility rooms, and garages. Spaces which already include vacancy sensors, motions sensors, or dimmers do not need to install new Title 24 Section 110.9(b)4C sensors.

B. A water heating package consisting of:

i. addition of exterior insulation meeting a minimum of R-6 to storage water heaters 20 gallons or larger in size, except for buildings with central water heating systems or if insulation installation would void the water heater warranty; and,

ii. insulation of all accessible hot water pipes with pipe insulation a minimum of 0.75 inches in thickness. This includes insulating the supply pipe leaving the water heater, piping to faucets underneath sinks, and accessible pipes in attic spaces and crawlspaces; and,

iii. upgrading of fittings in sinks and showers to meet current CALGreen standards, except for fixtures with rated flow rates no more than ten percent greater than current CALGreen standards.

**Note:** To the extent the provisions of Section 150.2(d) conflict with any other provisions of the California Energy Code, then the most energy conserving provisions shall supersede and control.

**Exception to Section 150.2(d):** The requirement for inclusion of energy efficiency measures does not apply to residential buildings that receive a rating of seven (7) or higher on the U.S. Department of Energy's Home Energy Score rating system based upon an assessment by a Home Energy Score Certified Assessor, to the satisfaction of the Building Official.

**PROPOSED TEXT CHANGES TO  
CARLSBAD MUNICIPAL CODE CHAPTER 18.21  
ELECTRIC VEHICLE INFRASTRUCTURE**

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**Legend to proposed text amendments:**

1. Existing Carlsbad Municipal Code (CMC) language appears as regular upright text.
  2. New CMC language is underlined.
  3. Excerpts from the California Green Building Standards Code (CALGreen) added to the CMC are shown in *italics*.
  4. Carlsbad additions to CALGreen are underlined, and deletions are shown in ~~strikeout~~.
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**Chapter 18.21 List of Sections**

Amend Chapter 18.21 List of Sections to add references to new sections as follows:

**Sections:**

- |                         |   |
|-------------------------|---|
| <b>18.21.010</b>        | <b>Adoption.</b>  |
| <b>18.21.020</b>        | <b>Building official designated.</b>  |
| <b>18.21.030</b>        | <b>Permit fees.</b>   |
| <b><u>18.21.120</u></b> | <b><u>California Green Building Standards Code Chapter 2 amended - Definitions</u></b>                              |
| <b><u>18.21.140</u></b> | <b><u>California Green Building Standards Code Chapter 4 amended – Residential electric vehicle charging</u></b>    |
| <b><u>18.21.150</u></b> | <b><u>California Green Building Standards Code Chapter 5 amended – Nonresidential electric vehicle charging</u></b> |

**Section 18.21.010**

Amend Section 18.21.010 as follows:

**18.21.010 Adoption.**

The 2016 California Green Building Standards Code copyrighted by the California Building Standards Commission, together with those amendments, exceptions, additions and deletions incorporated into this chapter, is adopted by reference as the Green Building Standards Code of the City of Carlsbad.

**Section 18.21.120**

Add Section 18.21.120 as follows:

**18.21.120 California Green Building Standards Code Chapter 2 amended – Definitions.**  
**Section 202 of the California Green Building Standards Code is amended to add the following definitions:**

EVSE CAPABLE. An electric vehicle charging space (EV space) installed with a listed raceway capable of accommodating a 208/240-volt dedicated branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or enclosure in close proximity to the proposed location of the EV spaces. Construction documents shall identify the raceway termination point. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

EVSE INSTALLED. An electric vehicle charging space (EV space) installed with a dedicated 208/240-volt branch circuit, including a listed raceway, electrical panel capacity, overcurrent protective device, wire, and receptacle. Receptacle shall be equipped with electric vehicle supply equipment (EVSE). The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter) and is required to be continuous at enclosed, inaccessible or concealed areas and spaces. The branch circuit and associated overcurrent protective device shall be rated at 40 amperes minimum. Other electrical components, including receptacle and EVSE, related to this section shall be installed in accordance with the California Electrical Code.

EVSE READY. An electric vehicle charging space (EV space) installed with a dedicated 208/240-volt branch circuit, including a listed raceway, electrical panel capacity, overcurrent protective device, wire, and termination point such as a receptacle or blank cover. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter) and is required to be continuous at enclosed, inaccessible or concealed areas and spaces. The termination point shall be in close proximity to the proposed location of an EV charger. The branch circuit and associated overcurrent protective device shall be rated at 40 amperes minimum. Other electrical components, including a receptacle or blank cover, related to this section shall be installed in accordance with the California Electrical Code.

MAJOR RESIDENTIAL RENOVATIONS. Alterations and additions to existing residential structures and construction sites where: (A) for one and two family dwellings and townhouses with attached private garages, alterations have a building permit valuation equal to or greater than \$60,000 or include an electrical service panel upgrade; or (B) for multifamily dwellings (three dwelling units or more), alterations have a building permit valuation equal to or greater than \$200,000, interior finishes are removed and significant site work and upgrades to structural and mechanical, electrical, and/or plumbing systems are proposed. Significant site work as used herein means site alterations that: require a grading permit pursuant to Carlsbad Municipal Code Chapter 15.16; rehabilitate or install 2,500 square feet or more of landscaping; or repave, replace or add 2,500 square feet or more of vehicle parking and drive area.

Section 18.21.140

Add Section 18.21.140 as follows:

**18.21.140 California Green Building Standards Code Chapter 4 amended – Residential electric vehicle charging.**

A. Section 4.102 of the California Green Building Standards Code is amended to read as follows:

**SECTION 4.102 DEFINITIONS**

**4.102.1 Definitions.** *The following terms are defined in Chapter 2.*

EVSE CAPABLE.

EVSE INSTALLED.

EVSE READY.

FRENCH DRAIN.

MAJOR RESIDENTIAL RENOVATIONS.

WATTLES.

B. Section 4.106.4 of the California Green Building Standards Code is amended to read as follows:

**4.106.4 Electric vehicle (EV) charging for new construction and major residential renovations.** *New construction and major residential renovations shall comply with Sections 4.106.4.1, 4.106.4.2, or 4.106.4.3, to facilitate ~~future~~ installation and use of EV chargers. Electric vehicle supply equipment (EVSE) shall be installed in accordance with the California Electrical Code, Article 625.*

**Exceptions:**

1. *On a case-by-case basis, where the local enforcing agency has determined EV charging and infrastructure are not feasible based upon one or more of the following conditions:*
  - 1.1. *Where there is no commercial power supply.*
  - 1.2. *Where there is evidence substantiating that meeting the requirements will alter the local utility infrastructure design requirements on the utility side of the meter so as to increase the utility side cost to the homeowner or the developer by more than \$400.00 per ~~dwelling-~~unit parking space.*
2. *Accessory Dwelling Units (ADU) and Junior Accessory Dwelling Units (JADU) without additional parking facilities.*
3. *Where major residential renovations for one and two family dwellings, and townhouses with attached private garages, do not include an electrical service panel upgrade, the requirements of Section 4.106.4.1 shall apply to*

the maximum extent that does not require an electrical service panel upgrade.

4. In major residential renovations, where there is evidence substantiating that meeting the requirements of this section presents an unreasonable hardship or is technically infeasible, the Building Official may consider an appeal from the project sponsor to reduce the number of EV spaces required or provide for EV charging elsewhere.

**4.106.4.1 New one- and two-family dwellings and townhouses with attached private garages and major residential renovations.** For each dwelling unit, install one EVSE Ready space. For each dwelling unit, install a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit over current protective device.

**4.106.4.1.1 Identification.** The service panel or subpanel circuit directory shall identify the overcurrent protective device ~~space(s) reserved~~ designated for future EV charging purposes as "EV CAPABLE READY" in accordance with the California Electrical Code. The ~~raceway termination location, receptacle or blank cover shall be identified shall be permanently and visibly marked~~ as "EV CAPABLE READY".

**4.106.4.2 New multifamily dwellings and major residential renovations.** Where 17 or more multifamily dwelling units are constructed on a building site, 3-If residential parking is available, ten (10) percent of the total number of parking spaces on a building site provided for all types of parking facilities, but in no case less than one, shall be electric vehicle charging spaces (EV spaces) capable of supporting installed and future EVSE. Calculations for the required number of EV spaces and EVSE Installed spaces shall be rounded up to the nearest whole number.

**Note:** Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging. Except for EVSE Installed spaces, there is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.

**4.106.4.2.1 Electric vehicle charging space (EV space) locations.** Construction documents shall indicate the location of proposed EV spaces. Where common use parking is provided At least one EVSE Installed space shall be located in the common use parking areas and shall be available for use by all residents.

**4.106.4.2.1.1 Electric vehicle charging stations (EVCS).** When EV chargers are installed, EV spaces required by Section 4.106.4.2.2, Item 3, shall comply with at least one of the following options:

1. The EV space shall be located adjacent to an accessible parking space meeting the requirements of the California Building Code, Chapter 11A, to allow use of the EV charger from the accessible parking space.
2. The EV space shall be located on an accessible route, as defined in the California Building Code, Chapter 2, to the building.

**Exception:** Electric vehicle charging stations designed and constructed in compliance with the California Building Code, Chapter 11B, are not required to comply with Section 4.106.4.2.1.1 and Section 4.106.4.2.2, Item 3.

**4.106.4.2.2 Electric vehicle charging space (EV space) dimensions.** The EV spaces shall be designed to comply with the following:

1. The minimum length of each EV space shall be 18 feet (5486 mm).
2. The minimum width of each EV space shall be 9 feet (2743 mm).
3. One in every 25 EV spaces, but not less than one, shall also have an 8-foot (2438 mm) wide minimum aisle. A 5-foot (1524 mm) wide minimum aisle shall be permitted provided the minimum width of the EV space is 12 feet (3658 mm).
  - a. Surface slope for this EV space and the aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083 percent slope) in any direction.

**4.106.4.2.3 Single EV space required.** When a single EV space is required, it shall be an EVSE Installed space.

**4.106.4.2.4 Multiple EV spaces required.** When multiple EV spaces are required, fifty (50) percent, but in no case less than one, shall be EVSE Installed spaces. The remainder of the required EV spaces may be EVSE Installed, EVSE Ready, or EVSE Capable spaces.

**4.106.4.2.4.1 Construction Documents.** Construction documents shall indicate the raceway termination point and proposed location of future EV spaces and EV chargers. Construction documents shall also provide information on amperage of future EVSE, raceway method(s), wiring schematics and electrical load calculations to verify that the electrical panel service capacity and electrical system, including any on-site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EV spaces at the full rated amperage of the EVSE. Plan design shall

be based upon a 40-ampere minimum branch circuit. Raceways and related components that are planned to be installed underground, enclosed, inaccessible or in concealed areas and spaces shall be installed at the time of original construction.

**4.106.4.2.5 Identification.** The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE" in accordance with the California Electrical Code.

**Notes:**

- ~~1. The California Department of Transportation adopts and publishes the "California Manual on Uniform Traffic Control Devices (California MUTCD)" to provide uniform standards and specifications for all official traffic control devices in California. Zero Emission Vehicle Signs and Pavement Markings can be found in the New Policies & Directives Number 13-01. Website: <http://www.dot.ca.gov/trafficops/policy/13-01.pdf>~~
- ~~2. See Vehicle Code Section 22511 for EV charging space signage in off-street parking facilities and for use of EV charging spaces.~~
- ~~3. The Governor's Office of Planning and Research (OPR) published a "Zero-Emission Vehicle Community Readiness Guidebook" which provides helpful information for local governments, residents and businesses. Website: <http://opr.ca.gov/docs/ZEV-Guidebook.pdf>.~~

**4.106.4.3 New hotels and motels.** All newly constructed hotels and motels shall provide EV spaces capable of supporting installed and future installation of EVSE. The construction documents shall identify the location of the EV spaces.

**Notes: -**

- ~~1. Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging. Except for EVSE Installed spaces,~~
- ~~2. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.~~

**4.106.4.3.1 Number of required EV spaces.** The number of required EV spaces and EVSE Installed spaces shall be based on the total number of parking spaces provided for all types of parking facilities in accordance with Table 4.106.4.3.1. Calculations for the required number of EV spaces and EVSE Installed spaces shall be rounded up to the nearest whole number.

TABLE 4.106.4.3.1

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED EV SPACES	<u>NUMBER OF REQUIRED EVSE INSTALLED SPACES</u>
0-9	<del>0</del> <u>1</u>	<u>1</u>
10-25	<del>1</del> <u>2</u>	<u>1</u>
26-50	<del>2</del> <u>4</u>	<u>2</u>
51-75	<del>3</del> <u>6</u>	<u>3</u>
76-100	<del>4</del> <u>8</u>	<u>5</u>
101-150	<del>6</del> <u>12</u>	<u>6</u>
151-200	<del>10</del> <u>17</u>	<u>9</u>
201 and over	<del>6-10</del> percent of total	<u>50 percent of required EV spaces</u>

**4.106.4.3.2 Electric vehicle charging space (EV space) dimensions.** The EV spaces shall be designed to comply with the following:

1. The minimum length of each EV space shall be 18 feet (5486 mm).
2. The minimum width of each EV space shall be 9 feet (2743 mm).

**4.106.4.3.3 Single EV space required.** When a single EV space is required, it shall be an EVSE Installed space shall be designed in accordance with Section 4.106.4.2.3.

**4.106.4.3.4 Multiple EV spaces required.** When multiple EV spaces are required per Table 4.106.4.3.1, the corresponding number of EVSE Installed spaces are required to be installed at the time of construction. the EV spaces shall be designed in accordance with Section 4.106.4.2.4. The remainder of the EV spaces required per Table 4.106.4.3.1 may be EVSE Installed, EVSE Ready, or EVSE Capable spaces.

**4.106.4.3.4.1 Construction documents.** Construction documents shall indicate the raceway termination point and proposed location of future EV spaces and EV chargers. Construction documents shall also provide information on amperage of future EVSE, raceway method(s), wiring schematics and electrical load calculations to verify that the electrical panel service capacity and electrical system, including any on-site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EV spaces at the full rated amperage of the EVSE. Plan design shall be based upon a 40-ampere minimum branch circuit. Raceways and related components that are planned to be installed underground, enclosed, inaccessible or in concealed areas and spaces shall be installed at the time of original construction.



**4.106.4.3.5 Identification.** *The service panels or subpanels shall be identified in accordance with Section 4.106.4.2.5.*

**4.106.4.3.6 Accessible EV spaces.** *In addition to the requirements in Section 4.106.4.3, EV spaces for hotels/motels and all EVSE, when installed, shall comply with the accessibility provisions for EV charging stations in the California Building Code, Chapter 11B.*

**Notes:**

1. *The California Department of Transportation adopts and publishes the "California Manual on Uniform Traffic Control Devices (California MUTCD)" to provide uniform standards and specifications for all official traffic control devices in California. Zero Emission Vehicle Signs and Pavement Markings can be found in the New Policies & Directives Number 13-01. Website: <http://www.dot.ca.gov/trafficops/policy.html>.*
2. *See Vehicle Code Section 22511 for EV charging space signage in off-street parking facilities and for use of EV charging spaces.*
3. *The Governor's Office of Planning and Research (OPR) published a "Zero-Emission Vehicle Community Readiness Guidebook" which provides helpful information for local governments, residents and businesses. Website: [https://opr.ca.gov/docs/ZEV\\_Guidebook.pdf](https://opr.ca.gov/docs/ZEV_Guidebook.pdf).*
4. *The Governor's Interagency Working Group on Zero-Emission Vehicles, 2016, "2016 ZEV Action Plan, An Updated Roadmap toward 1.5 Million Zero-Emission Vehicles on California Roadways by 2025." [https://www.gov.ca.gov/docs/2016\\_ZEV\\_Action\\_Plan.pdf](https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf).*

**Section 18.21.150**

Add Section 18.21.150 as follows:

**18.21.150 California Green Building Standards Code Chapter 5 amended – Nonresidential electric vehicle charging.**

**A. Section 5.102 of the California Green Building Standards Code is amended to read as follows:**

**SECTION 5.102 DEFINITIONS**

**5.102.1 Definitions.** *The following terms are defined in Chapter 2.*

**CUTOFF LUMINAIRES.**

EVSE CAPABLE.

EVSE INSTALLED.

EVSE READY.

LOW-EMITTING AND FUEL EFFICIENT VEHICLES.

NEIGHBORHOOD ELECTRIC VEHICLES.

TENANT-OCCUPANTS.

VANPOOL VEHICLE.

ZEV.

B. Section 5.106.5.3 of the California Green Building Standards Code is amended to read as follows:

**5.106.5.3 Electric vehicle (EV) charging. [N]** Construction shall comply with Section 5.106.5.3.1 or Section 5.106.5.3.2 to facilitate installation and future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be in accordance with the California Building Code, the California Electrical Code and as follows:

**5.106.5.3.1 Single charging space requirements. [N]** When only a single charging space is required per Table 5.106.5.3.3, ~~a dedicated 208/240-volt branch circuit, including raceway, electrical panel capacity, overcurrent protectives, wire, and receptacle is required. Receptacle shall be equipped with electric vehicle supply equipment (EVSE) a raceway is required to be installed at the time of construction and one EVSE Installed space shall be installed in accordance with the California Electrical Code. Construction plans and specifications shall include, but are not limited to, the following:~~

- ~~1. The type and location of the EVSE.~~
- ~~2. A listed raceway capable of accommodating with a 208/240-volt dedicated branch circuit.~~
- ~~3. The raceway shall not be less than trade size 1."~~
- ~~4. The raceway shall originate at a service panel or a subpanel serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into a listed suitable cabinet, box, enclosure or equivalent.~~
- ~~5. The service panel or subpanel shall have sufficient capacity to accommodate a minimum 40-ampere dedicated branch circuit for the future installation of the EVSE.~~

**5.106.5.3.2 Multiple charging space requirements. [N]** When multiple ~~charging~~ EV spaces are required per Table 5.106.5.3.3, raceway(s) is/are the corresponding

number of EVSE Installed spaces are required to be installed at the time of construction and shall be installed in accordance with the California Electrical Code. The remainder of the EV spaces required per Table 5.106.5.3.3 may be EVSE Installed, EVSE Ready, or EVSE Capable spaces.

**5.106.5.3.2.1 Construction documents.** Construction plans and specifications shall include, but are not limited to, the following:

1. The type and location of the EVSE.
2. The raceway(s) shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into listed suitable cabinet(s), box(es), enclosure(s) or equivalent.
3. Plan design shall be based upon 40-ampere minimum branch circuits.
4. Electrical calculations shall substantiate the design of the electrical system, to include the rating of equipment and any on-site distribution transformers and have sufficient capacity to simultaneously charge all required EVs at its full rated amperage.
5. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.

**5.106.5.3.3 EV charging space calculation.** [N] Table 5.106.5.3.3 shall be used to determine if single or multiple charging space requirements apply for the installation and future installation of EVSE.

**Exceptions:** On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure is not feasible based upon one or more of the following conditions:

1. Where there is insufficient electrical supply.
2. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.

**TABLE 5.106.5.3.3**

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CHARGING SPACES	<u>NUMBER OF REQUIRED EVSE INSTALLED SPACES-EQUIPPED WITH EVSE</u>
0-9	<u>01</u>	<u>1</u>

10-25	<u>12</u>	<u>1</u>
26-50	<u>24</u>	<u>2</u>
51-75	<u>46</u>	<u>3</u>
76-100	<u>59</u>	<u>5</u>
101-150	<u>712</u>	<u>6</u>
151-200	<u>1017</u>	<u>9</u>
201 and over	<u>6-10</u> percent of total <sup>1</sup>	<u>50 percent of required EVSE Installed-charging spaces<sup>1</sup></u>

1. Calculation for EV spaces and EVSE Installed spaces shall be rounded up to the nearest whole number.

**5.106.5.3.4 [N] Identification.** The service panel or subpanel(s) circuit directory shall identify the reserved overcurrent protective device space(s) for future EV charging as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE."

**5.106.5.3.5 [N] Future charging spaces qualify as designated parking as described in Section 5.106.5.2 Designated parking for clean air vehicles.**

**Notes:**

~~6-1.~~ 6-1. The California Department of Transportation adopts and publishes the California Manual on Uniform Traffic Control Devices (California MUTCD) to provide uniform standards and specifications for all official traffic control devices in California. Zero Emission Vehicle Signs and Pavement Markings can be found in the New Policies & Directives number 13-01. [www.dot.ca.gov/hq/traffops/policy/13-01.pdf](http://www.dot.ca.gov/hq/traffops/policy/13-01.pdf).

~~7-2.~~ 7-2. See Vehicle Code Section 22511 for EV charging spaces signage in off-street parking facilities and for use of EV charging spaces.

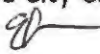
~~8-3.~~ 8-3. The Governor's Office of Planning and Research published a Zero-Emission Vehicle Community Readiness Guidebook which provides helpful information for local governments, residents and businesses. [www.opr.ca.gov/docs/ZEV\\_Guidebook.pdf](http://www.opr.ca.gov/docs/ZEV_Guidebook.pdf).

To the members of the:  
CITY COUNCIL  
ACM ✓ CA ✓ CC ✓  
Date 2/26/19 CM ✓ COO ✓



## Council Memorandum

Feb. 26, 2019

**To:** Honorable Mayor Hall and Members of the City Council  
**From:** for Gary T. Barberio, Assistant City Manager   
**Via:** Scott Chadwick, City Manager  
**Re:** Responses to Questions from February 25 City Council Briefings

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**Agenda Item No. 2 –** Agreements with Northstar Utilities Solutions and Invoice Cloud for Utility Billing System Upgrade and Payment Services

**Question 1:** Per our CMC, why was this not pursued through a RFP process?

**Answer:** An RFP process was not used as the city is upgrading software it already has a license for from the company that created the software. The software upgrade can only be obtained from the company that created the software. During the contract process, city IT staff investigated whether the upgrade could be obtained from any other source and was unable to find any other vendors. Therefore, the city IT Department is bringing forward the contracts for City Council consideration pursuant to CMC 3.28.060(A)(2), as there is only one firm that can reasonably provide the services.

**Agenda Item No. 3 –** Energy Conservation and Electric Vehicle Charging Infrastructure Ordinances

**Question 1:** Please provide the link to the costing and technical studies referenced.

**Answer:** <http://carlsbadca.gov/services/depts/pw/environment/cap/ordinances.asp>

**Question 2:** What outreach specifically to residents was conducted?

**Answer:** Two of the proposed CAP ordinances affect residents directly, the energy efficiency and EV charging ordinances. Based on past permit data, the number of projects that would meet the threshold in a typical year is between 30 and 50. Since it was not possible to identify those residents potentially considering major remodels in the future, the project team prepared informational materials about the proposed ordinances and made them available on the city website, at the Faraday Center building counter, the City Clerk's Office and Dove Library. In addition, the project team reached out to the architects, builders and contractors who have worked with residents on projects of this size in recent years and who generally do business in Carlsbad.