

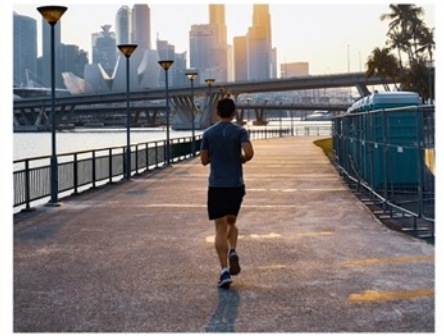


Green Building Reach Codes

BAYREN FALL FORUM

November 18, 2021

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104,000

COMMERCIAL LEED PROJECTS

23 billion

TOTAL SQUARE FEET PARTICIPATING IN LEED

2.6 Million

CERTIFIED SQUARE FEET PER DAY

LEED PROJECTS ARE FOUND IN

180

 countries & territories

1.6 million

RESIDENTIAL UNITS REGISTERED & CERTIFIED



203,000

TOTAL LEED PROFESSIONALS

The California Building Code

- Title 24 includes Parts 1-11
- Energy code (Part 6)
- CALGreen (Part 11)
 - CALGreen Mandatory Measures now cover nearly all occupancies and scopes of work





- Effective since 2011 with increasing stringency and scope
- Provides a set of **Mandatory Provisions** that are required for nearly all permitted projects:
 - Basic quality construction practices
 - Green practices not addressed in the building code before
 - Duplication of requirements found elsewhere in the code
 - Additive to other regulations or code requirements

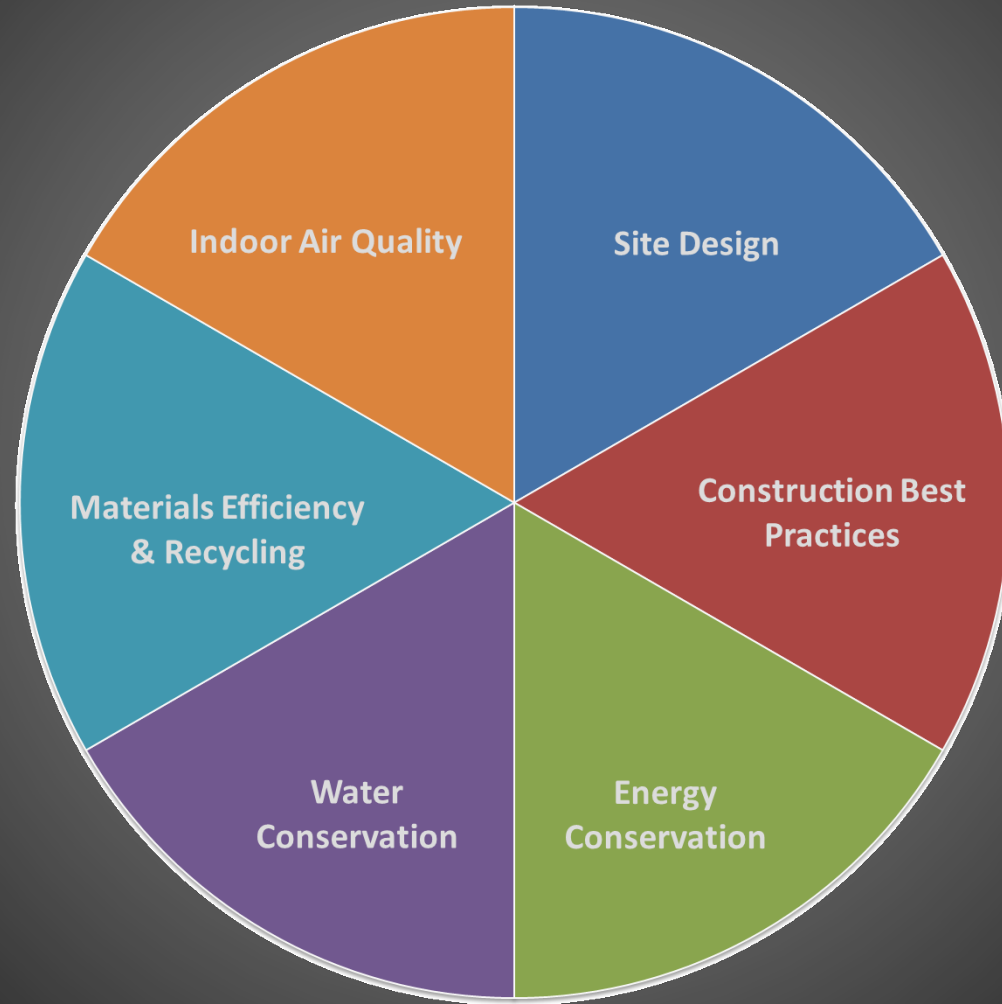


- **Mandatory Measures** apply to nearly all residential and nonresidential additions and alterations:
 - Residential: applies to all additions/alterations that add floor area or volume
 - Nonresidential: some measures required for additions/alterations >1000 square feet or permit valuation >\$200,000
- These are state mandated minimum requirements that all projects must meet.
 - Local governments can exceed CALGreen by filing findings based on climatic, topographical or geological conditions (see CALGreen section 101.7)



- CALGreen provides optional “Tiers” that may be adopted via local amendment:
 - Energy requirements developed by CEC
 - Additional green strategies
 - Increased thresholds for Mandatory Measures
 - Choose from menu of additional options
- Local jurisdictions must file findings to adopt a Reach Code or CALGreen Tier:
 - The Tiers can be modified as desired when adopting

CALGreen Measure Categories



CALGreen RESIDENTIAL Mandatory Provisions

- Stormwater drainage & retention measures
- EV parking spaces
- Energy = Title 24 (part 6) baseline
- Substantial indoor and outdoor water use reduction
- Seal joints & openings in building to prevent the passage of rodents
- Divert at least 65% of Construction & Demolition waste
- Provide space and plan for recycling by occupants
- Develop a building maintenance & operation manual
- Fireplace restrictions
- Covering of duct openings and protection of mechanical equipment during construction
- Vapor barriers for concrete slab foundations
- Moisture content of building materials
- Limits on interior finish material off-gassing:
 - Paints, adhesives, caulking, carpet, carpet cushions; formaldehyde in wood products
- Energy Star bathroom fans with humidistat
- Correct sizing of heating & air conditioning systems

CALGreen NONRESIDENTIAL Mandatory Provisions

Includes the RESIDENTIAL provisions, plus these:


- Bicycle parking
- Light pollution reduction
- Shade trees
- Commissioning for new buildings > 10,000 square feet
- Substantial indoor and outdoor water use reduction (follow the [Model Water Efficient Landscape Ordinance \(MWELO\)](#))
- Overhangs to prevent rain intrusion; landscape sprinklers don't spray buildings
- Filtration for ventilation systems
- Prohibit smoking in buildings and at building entries
- Minimum ventilation and CO2 monitoring (per energy code)
- Acoustical control
- No CFCs or Halons in HVAC, refrigeration, and fire suppression systems
- Supermarket refrigerant leak reduction

Overview of CALGreen Voluntary “Tier” Measures

- Increased requirements or thresholds:
 - Electric Vehicle charging
 - Water use reduction indoors/outdoors
 - Energy efficiency/renewables
 - Low emitting materials
 - Construction waste recycling
- New measures not found in the mandatory code:
 - Site selection criteria
 - Cool roofs, vegetated roofs
 - Deconstruction and reuse of buildings
 - Recycled content materials
 - Efficient framing
 - Reduction in cement content in concrete
 - Whole building life-cycle analysis
 - Lighting and thermal comfort controls



CALGreen Compliance Checklists



CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY

2020 Los Angeles Green Building Code

MANDATORY REQUIREMENTS CHECKLIST


NEWLY CONSTRUCTED NON-RESIDENTIAL BUILDINGS

(COMPLETE AND INCORPORATE THIS FORM INTO THE PLANS)

FORM
GRN 5

Permit # _____ - _____ - _____ Date: _____

ITEM #	CODE SECTION	REQUIREMENT	REFERENCE SHEET (Sheet # or N/A)	COMMENTS (e.g. note #, detail # or reason for N/A)
PLANNING AND DESIGN				
1	5.106.1	Storm water pollution prevention		
2	5.106.4.1.1	Short-term bicycle parking		
3	5.106.4.1.2	Long-term bicycle parking		
4	5.106.5.2	Designated parking		
5	5.106.5.3	Electric vehicle charging		
6	5.106.8	Light pollution reduction		
7	5.106.10	Grading and paving		
8	5.106.11	Hardscape alternatives		
ENERGY EFFICIENCY				
9	5.211.1	Solar ready buildings		
WATER EFFICIENCY & CONSERVATION				
10	5.303.1.1	New buildings in excess of 50,000 sq. ft.		
11	5.303.1.2	Excess consumption		
12	5.303.2	Water reduction		
13	5.303.3	Water conserving plumbing fixtures and fittings		
14	5.303.3.3	Showerheads		
15	5.304.1	Outdoor water use in landscape areas		
16	5.304.3	Irrigation controller and sensor application		
17	5.304.4	Outdoor water use meters		
18	5.304.5	Exterior faucets		
19	5.305.1	Graywater ready		



CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY

2020 Los Angeles Green Building Code

MANDATORY REQUIREMENTS CHECKLIST

NEWLY CONSTRUCTED RESIDENTIAL BUILDINGS

(COMPLETE AND INCORPORATE THIS FORM INTO THE PLANS)

FORM
GRN 4

Permit # _____ - _____ - _____ Date: _____

ITEM #	CODE SECTION	REQUIREMENTS	REFERENCE SHEET (Sheet # or N/A)	COMMENTS (e.g. note #, detail # or reason for N/A)
PLANNING AND DESIGN				
1	4.106.2	Storm water drainage and retention during construction		
2	4.106.3	Grading and paving		
3	4.106.4	Electric vehicle (EV) charging		
4	4.106.5	Cool roof for reduction of heat island effect		
5	4.106.7	Reduction of heat island effect for non-roof areas		
ENERGY EFFICIENCY				
6	4.211.4	Solar ready buildings		
WATER EFFICIENCY & CONSERVATION				
7	4.303.1	Water conserving plumbing fixtures and fittings		
8	4.303.1.3.2	Multiple showerheads serving one shower		
9	4.303.3	Water submeters		
10	4.303.4	Water use reduction		
11	4.304.1	Outdoor water use in landscape areas		
12	4.304.2	Irrigation controllers		
13	4.304.3	Metering outdoor water use		
14	4.304.4	Exterior faucets		

Anticipated 2022 CALGreen Code Updates

Expected to take effect January 1, 2023

Significant Changes:

Indoor Air Quality: Nonresidential buildings only

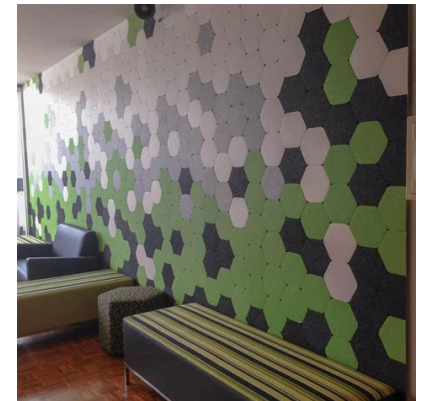
- Requires low-emitting thermal insulation
- Requires low emitting acoustical ceiling and wall panels

EV Charging:

- Increased EV charging for multifamily, nonresidential, warehouse, retail and grocery buildings
- Removed requirement to mark additional parking spaces for “clean air vehicles”

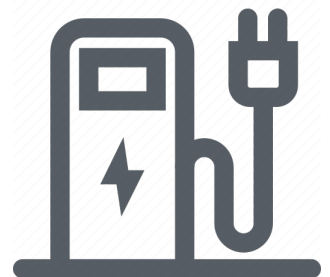
Low Emitting Materials - NONRESIDENTIAL

- **5.504.4.7 Thermal insulation.** *(Relocated from Section A5.504.4.8)*
 - Insulation products must comply with the requirements of the California Department of Public Health, “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,” Version 1.2, January 2017 (Emission testing method for California ***Specification 01350***)
- **5.504.4.8 Acoustical ceilings and wall panels.** *(Relocated from Section A5.504.9)*
 - Comply with CDPH limits (same as thermal insulation above)



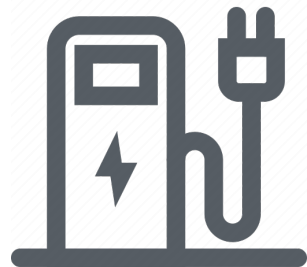
EV Updates to RESIDENTIAL code (HCD)

- **EV charging for New Multifamily, Hotel/Motel:**
 - EV Capable: Require 10% of all parking spaces to be Level 2 EV "capable"
 - EV Ready: 25% equipped with low power Level 2 EV charging receptacles
 - EV Chargers: For new buildings with 20 or more parking spaces:
 - 5% of the total number of parking spaces shall be equipped with Level 2 EVSE (rounded up)
- **EV charging for Existing parking lot additions/alterations**
 - 10% of added or altered spaces must be EV Level 2 ready
 - Required for electrical systems, PV, or lighting system additions/alterations
 - Does not apply to repairs, resurfacing, striping, etc.
- **Tier (Voluntary) measures:**
 - Tier 1: 35% EV capable spaces and 10% EV Chargers installed
 - Tier 2: 40% EV capable and 15% EV Chargers installed



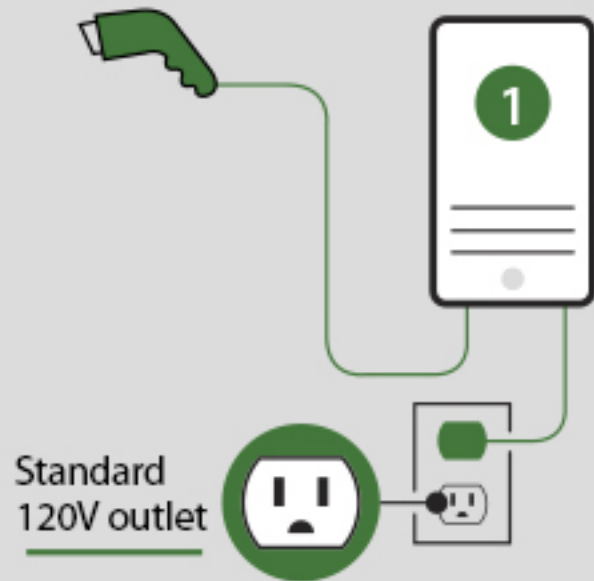
EV Updates to NON-RESIDENTIAL code (BSC)

- **EV charging for New buildings with 10-25 parking spaces:**
 - EV Capable: Require 20% of all parking spaces to be Level 2 EV "capable"
 - No requirements for actual EV Chargers to be installed
- **EV charging for New buildings with 25+ parking spaces:**
 - EV Capable: Require 20% of all parking spaces to be EV Capable
 - EV Chargers: 25% of the number of required EV Capable spaces must be wired for Chargers (EVSE). (in other words, 5% of all spaces must have EV charging)
 - Provisions for Direct Current Fast Chargers and Automatic Load Management Systems
- **EV charging for New warehouses, grocery stores, and retail buildings**
 - Those with off-street loading spaces shall install infrastructure to support future EV charging of medium-duty and heavy-duty vehicles
- **Tier (Voluntary) measures: Similar increases as the Residential code**



Level 1

120V



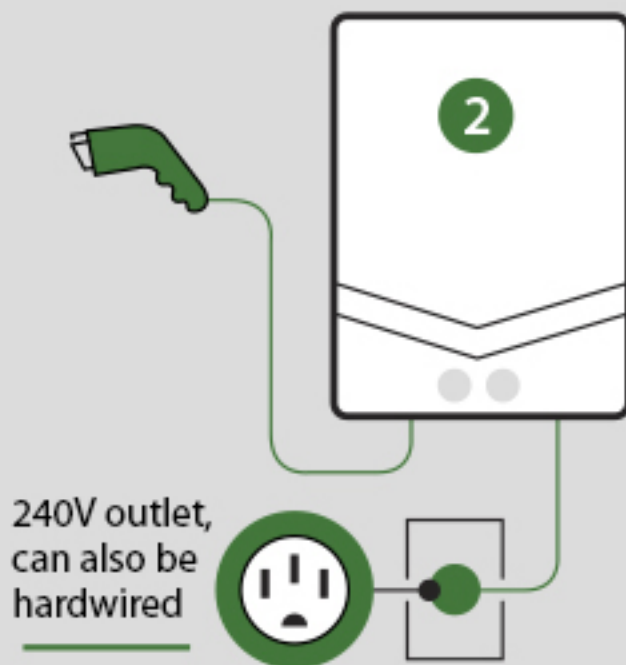
Adds 5 miles
per hour
of charge*



Residential use

Level 2

240V



Adds 20-60
miles per hour
of charge*



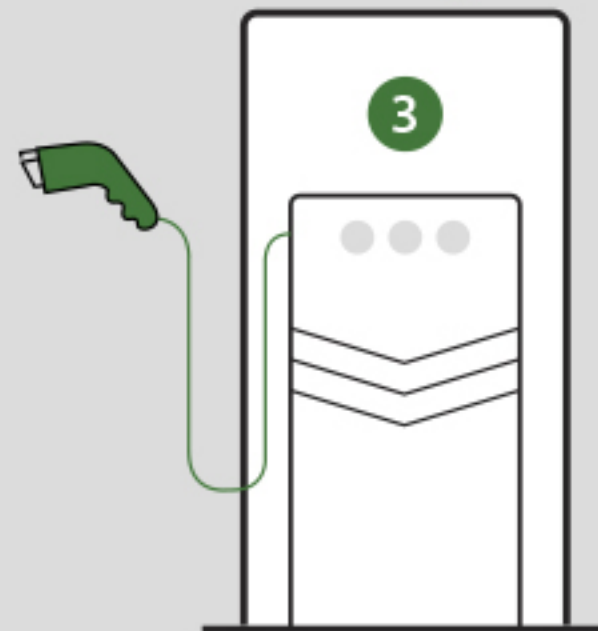
Residential &
commercial
use



Level 3

480V

DC Fast Charger



Adds 60-100 miles
per 20 minutes
of charge*



Commercial use

* Estimated. Actual charge times may vary.

EV DEFINITIONS



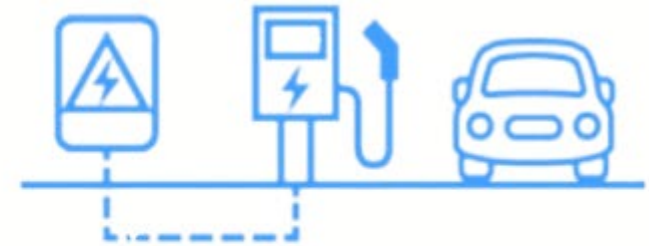
EV Capable

A vehicle space with electrical panel space and load capacity to support a branch circuit and necessary raceways, both underground and/or surface mounted, to support EV charging.



EV Ready

A vehicle space which is provided with a branch circuit; any necessary raceways, both underground and/or surface mounted; to accommodate EV charging, terminating in a receptacle or a charger.



EVSE

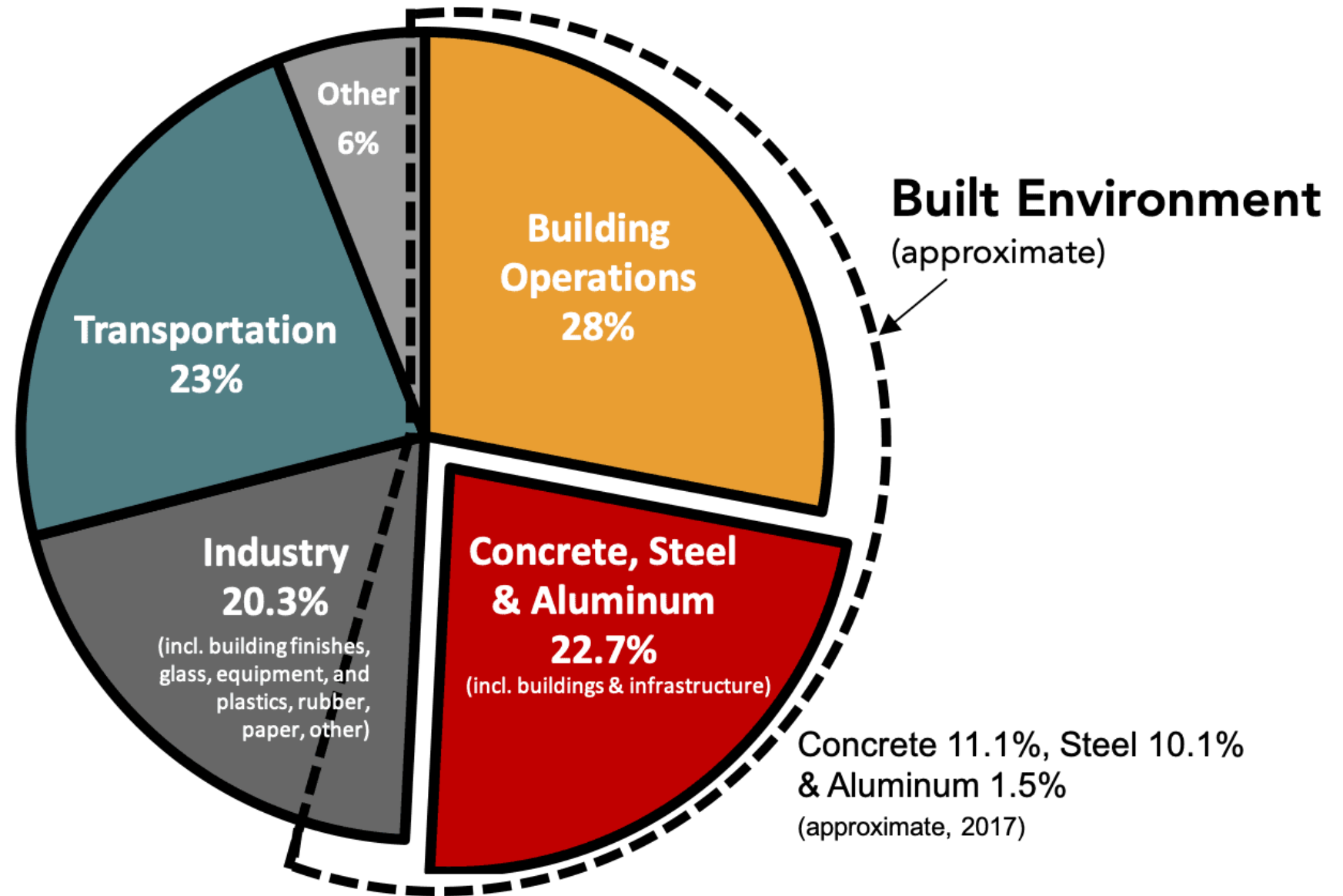
Level 2 electric vehicle supply equipment (EVSE) is installed for the purpose of transferring energy between the premises wiring and the electric vehicle.

AUTOMATIC LOAD MANAGEMENT SYSTEM (ALMS). A system designed to manage load across one or more electric vehicle supply equipment (EVSE) to share electrical capacity and/or automatically manage power at each connection point.

Green Building Reach Codes & Rating Systems



Embodied Carbon

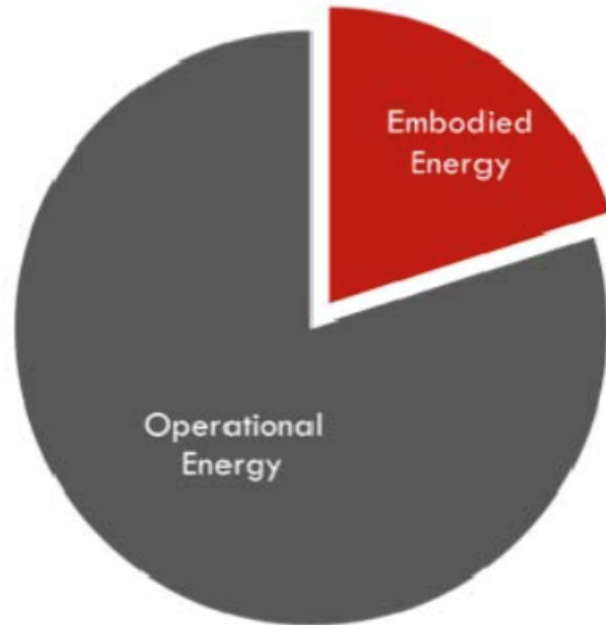


Global CO₂ Emissions by Sector

Source: IEA, Global ABC, Architecture 2030



Typical Building



High Performance



**As buildings become more energy efficient to operate,
The relative importance of embodied energy increases.**

Reach Codes to Reduce Embodied Carbon

- Marin County's low-carbon concrete code
- Whole Building LCA:
 - Utilize the CALGreen Tier measures A5.409 (nonres) "Life Cycle Assessment"
- Buy Clean California Act
- "Directed Use of LEED" policy:
 - Require projects to certify to LEED and meet specific credits:
 - Building reuse
 - Whole building LCA
 - Environmental Product Declarations (EPDs)
 - Low-carbon construction materials
 - Construction waste recycling

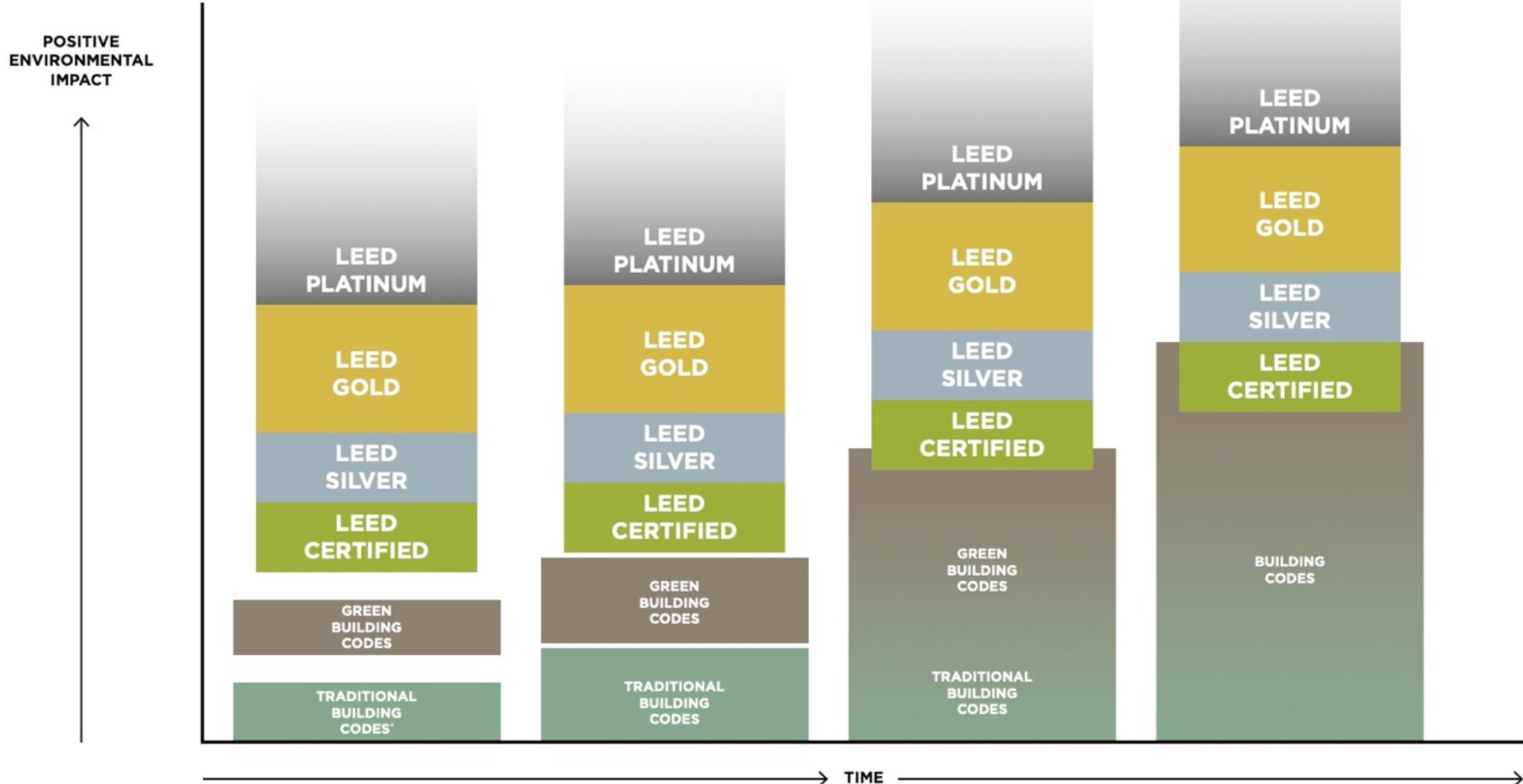


EPD = a published lifecycle assessment of a product



Accelerating Market Transformation through Building Codes and LEED

Traditional building code is evolving to include sustainability measures, leading to a redefinition of leadership in the built environment. LEED and building codes must work together to support complementary best practices in order to fuel higher levels of performance and sustainability. USGBC works with jurisdictions to align LEED with local code to help projects exceed minimum requirements and provide opportunities for leadership through LEED certification.



Resources

- Green Codes:
 - CALGreen online viewing: www.dgs.ca.gov/BSC/CALGreen
 - CALGreen checklist from LA: www.ladbs.org/forms-publications/forms/green-building/2020-green-building-forms-correction-sheets
 - Residential CALGreen resources: www.hcd.ca.gov/building-standards/calgreen/index.shtml
- Embodied Carbon
 - Marin County: Low-Carbon Concrete Code:
 - <https://www.marincounty.org/depts/cd/divisions/sustainability/low-carbon-concrete>
 - StopWaste Materials-climate Nexus: www.stopwaste.org/at-work/built-environment/climate-action-adaptation/materials-climate-nexus
 - Codes for Climate: www.codesforclimate.org
 - Carbon Leadership Forum: <https://carbonleadershipforum.org/>
 - Buy Clean California: www.dgs.ca.gov/PD/Resources/Page-Content/Procurement-Division-Resources-List-Folder/Buy-Clean-California-Act
- USGBC and LEED:
 - www.usgbc.org/green-codes
 - www.usgbc.org/leed/v41