



# SUSTAINABLE DEVELOPMENT CODE: WHERE WE ARE & WHERE WE ARE HEADED

Jonathan Rosenbloom | 2019 RMLUI | University of Denver

# SUSTAINABLE DEVELOPMENT CODE

GREENHOUSE



## DIVE IN Chapters

NOT SURE WHERE  
TO BEGIN?

[START HERE]





# WHAT'S CHALLENGING YOUR COMMUNITY?

## DIVE IN

Select Your Challenge Below

### CHAPTER 1 : ENVIRONMENTAL HEALTH AND NATURAL RESOURCES



CLIMATE CHANGE



LOW-IMPACT DEVELOPMENT  
AND STORMWATER  
MANAGEMENT



SENSITIVE LANDS AND  
WILDLIFE HABITAT



WATER SUPPLY QUALITY  
AND QUANTITY



SOLID WASTE MANAGEMENT



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## CHAPTER 6 : HEALTHY NEIGHBORHOODS AND FOOD SECURITY

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## CHAPTER 7 : ENERGY

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 7.3	OTHER ENERGY GENERATION SYSTEMS	 7.4	DISTRICT ENERGY SYSTEMS
 7.5	ENERGY CONSERVATION AND EFFICIENCY		

	Remove Code Barriers	Create Incentives	Fill Regulatory Gaps
<b>Best</b>	<ul style="list-style-type: none"> <li>DISTRICT HEATING AND COOLING ZONES</li> <li>RENEWABLE ENERGY FOR HISTORIC BUILDINGS</li> </ul>	<ul style="list-style-type: none"> <li>ENACT PROPERTY ASSESSED CLEAN ENERGY PROGRAM</li> <li>PROMOTE RENEWABLE ENERGY WITH INCENTIVES</li> <li>PROPERTY TAX EXEMPTIONS FOR RENEWABLE ENERGY SYSTEMS</li> </ul>	<ul style="list-style-type: none"> <li>CREATE SAFE ROUTES</li> <li>CREATE URBAN GROWTH AREA</li> <li>ENERGY BENCHMARKING, AUDITING, AND UPGRADING</li> <li>ESTABLISH URBAN SERVICE AREA</li> <li>EXPAND TREE CANOPY COVER</li> <li>REQUIRE WATER EFFICIENT LANDSCAPING</li> <li>THIRD-PARTY CERTIFICATION REQUIREMENTS</li> <li>VEGETATION PROTECTION AREAS</li> <li>ZERO NET ENERGY BUILDINGS</li> </ul>
<b>Better</b>	<ul style="list-style-type: none"> <li>CHANGE HEIGHT &amp; SETBACKS TO ENCOURAGE RENEWABLES</li> <li>PERMIT LOCAL RECYCLING CENTERS</li> </ul>	<ul style="list-style-type: none"> <li>ENCOURAGE INFILL DEVELOPMENT</li> <li>RECYCLE, SALVAGE AND REUSE BUILDING MATERIALS</li> <li>RECYCLING IN MULTI-FAMILY AND COMMERCIAL BUILDINGS</li> <li>VARYING UNIT SIZES WITHIN MULTI-FAMILY AND MIXED-USE BUILDINGS</li> </ul>	<ul style="list-style-type: none"> <li>CREATE GREEN ZONES</li> <li>ESTABLISH MAXIMUM SIZE OF SINGLE-FAMILY RESIDENCES</li> <li>OPEN SPACE IMPACT FEES</li> <li>PARKING MAXIMUMS</li> <li>REQUIRE NATIVE TREES AND REMOVAL OF INVASIVE TREES</li> <li>VARYING UNIT SIZES WITHIN MULTI-FAMILY AND MIXED-USE BUILDINGS</li> </ul>
<b>Good</b>	<ul style="list-style-type: none"> <li>ALLOW ACCESSORY DWELLING UNITS</li> <li>ALLOW LIVE-WORK UNITS</li> <li>ALLOW SOLAR SYSTEMS AND WIND TURBINES BY-RIGHT</li> <li>ALLOW TINY HOMES AND COMPACT LIVING SPACES</li> <li>CLUSTER/CONSERVATION SUBDIVISION</li> </ul>	<ul style="list-style-type: none"> <li>ENHANCING ENERGY AND WATER EFFICIENCY</li> <li>GREEN ROOFING</li> <li>PERVIOUS COVER MINIMUMS AND INCENTIVES</li> <li>PRIORITY PARKING FOR HYBRID &amp; ELECTRIC VEHICLES</li> </ul>	<ul style="list-style-type: none"> <li>GREEN ROOFING</li> <li>PERVIOUS COVER MINIMUMS AND INCENTIVES</li> </ul>

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ALL

REMOVE CODE BARRIERS

CREATE INCENTIVES

FILL REGULATORY GAPS

VIEW ALL SUBCHAPTER ACTIONS »

## BEST

CREATE SAFE ROUTES

CREATE URBAN GROWTH AREA

DISTRICT HEATING AND COOLING  
ZONESENACT PROPERTY ASSESSED  
CLEAN ENERGY PROGRAMENERGY BENCHMARKING, AUDITING,  
AND UPGRADING

ESTABLISH URBAN SERVICE AREA

EXPAND TREE CANOPY COVER

PROMOTE RENEWABLE ENERGY  
WITH INCENTIVESPROPERTY TAX EXEMPTIONS FOR  
RENEWABLE ENERGY SYSTEMSRENEWABLE ENERGY FOR HISTORIC  
BUILDINGS

## Zero Net Energy Buildings

*Brandon Hanson (author), Jonathan Rosenbloom & Christopher Duerksen  
(editors)*

## INTRODUCTION

The burning of fossil fuels is the primary source of greenhouse gas (GHG) emissions in the US.<sup>[1]</sup> With the production of energy amounting to 28% of the United States total GHG emissions,<sup>[2]</sup> reducing the amount of energy produced through fossil fuels can have a large impact on the mitigation of GHGs.<sup>[3]</sup> This proposal seeks such reductions by establishing zero net energy requirements. Zero net energy buildings seek to produce as much energy as they use through renewable resources, typically based on annual energy use and production. Net zero energy buildings also promote more efficient energy consumption habits, as a reduction in consumption correlates directly with the production rate. Local government ordinances addressing net zero energy buildings provide for a variety of energy production types, including solar, wind, and geothermal.<sup>[4]</sup>

## EFFECTS

The most direct benefit stemming from zero net energy ordinances is a reduction in fossil fuels and associated GHGs that contribute to global warming.<sup>[9]</sup> Encouraging the installation of renewable energy can also have significant long-term economic benefits for



## EXAMPLES


### Lancaster, CA

Lancaster, California has been a leader in requiring renewable energy.<sup>[16]</sup> After a long history of supporting solar development, Lancaster amended its building code to require that new buildings be outfitted with a solar energy system.<sup>[17]</sup> New single-family homes must have solar energy systems that can produce two watts of power for every square foot of the home.<sup>[18]</sup> This requirement can be modified if the builder provides documentation that a smaller system is able to meet the zero net energy requirements. If a developer cannot comply with the solar standards, they may be able to meet the requirements through other means.<sup>[19]</sup> Additionally, Lancaster adopted the California Energy Code, part of the California Code of Regulations, which requires most new residential buildings to have a solar ready area.<sup>[20]</sup> This area need not be outfitted with solar panels, but must have the capacity to install panels at a later date.<sup>[21]</sup> Multifamily residences must have a solar ready area of at least 15 percent of the total roof area.<sup>[22]</sup> Combined, these policies help Lancaster move toward zero net energy buildings. A process that the whole state of California is moving towards, with the plan from the California Energy Commission.<sup>[23]</sup>

To view the provision see [Lancaster, Cal., Energy Code § 15.28.020 \(2017\)](#).

To view the provision see [Cal. Code Regs. Tit. 24 § 6-110.10 \(b\) \(2016\)](#).

## ADDITIONAL EXAMPLES



[Sebastopol, CA, Sebastopol City Code § 15.72 \(pub. 2018\)](#) (imposes minimum solar energy requirements that allow a calculation by set minimum area or by the buildings energy needs, the minimum offset is 75% off the electrical load annually).

[Scottsdale, AZ, Green Construction Code § 31-145 \(I\) 610.1 \(2017\)](#) (lists several on site renewable energy system electric output requirements, based on individual consumption or floor space, and the international energy conservation code).

[Santa Fe, NM, Santa Fe City Code § 7-4.2 \(2009\)](#) (creates incentives for those cooperating with the Residential Green building code).

[Santa Monica, CA, Ordinance No: 2540 CCS \(2016\)](#) (requires that all new single family and multifamily residential buildings be outfitted with solar photovoltaic energy production).

## CITATIONS

[1] Intergovernmental Panel on Climate Change, *Climate Change 2014: Synthesis Report*, 48-49.

[2] Environmental Protection Agency, *Sources of Greenhouse Gas Emissions*, epa.gov, <https://perma.cc/UA9T-9VMH> (last visited May 15, 2018).

[3] *Id.*

[4] US Dep't of Energy, *A common Definition for Zero Energy Buildings* (Sep. 2015) <https://perma.cc/PFT2-K3R2>.

[5] Andrew F. Daehler, *Introduction to Modern Climate Change*, Cambridge University Press.

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GREENHOUSE



## DIVE IN Chapters

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TO BEGIN?

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## Archives

September 2018

### Third-Party Certification Requirements

Allow Accessory Dwelling Units Introduction Accessory dwelling units (ADUs) help maximize space in residential districts. ADUs are additional living quarters on single-family lots that are independent of the primary dwelling unit and can go...

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### Expand Tree Canopy Cover

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CREATE INCENTIVES

FILL REGULATORY GAPS

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### BEST

CREATE SAFE ROUTES

CREATE URBAN GROWTH AREA

DISTRICT HEATING AND COOLING ZONES

ENACT PROPERTY ASSESSED CLEAN ENERGY PROGRAM

ENERGY BENCHMARKING, AUDITING, AND UPGRADING

ESTABLISH URBAN SERVICE AREA

EXPAND TREE CANOPY COVER

PROMOTE RENEWABLE ENERGY WITH INCENTIVES

PROPERTY TAX EXEMPTIONS FOR RENEWABLE ENERGY SYSTEMS

RENEWABLE ENERGY FOR HISTORIC BUILDINGS

REQUIRE WATER EFFICIENT LANDSCAPING

THIRD-PARTY CERTIFICATION REQUIREMENTS

## Expand Tree Canopy Cover

*Alec LeSher (author), Jonathan Rosenbloom & Christopher Duerksen (editors)*

### INTRODUCTION

A local government's tree canopy is the jurisdiction's area that is shaded by trees. Typically, as land is developed, the tree canopy is reduced because trees are removed to clear space for development. One study estimates that urban areas across the United States lost 36 million trees per year from 2009 to 2014.<sup>[1]</sup> Tree canopies provide numerous public and private benefits, including reduced air pollution, reduced heating and cooling demands, increased property values, improved physical and mental health, and reduced storm water runoff.<sup>[2]</sup>

This ordinance facilitates the growth of local tree canopy cover by requiring minimal tree canopy coverage per site or development, reforestation standards, and/or landscaping credits to developers that voluntarily plant more trees than required. Local governments have a variety of options when it comes to drafting these ordinances. They may set canopy minimums by percentage or area, may make the minimums applicable to residential, commercial, and/or industrial uses, and may set different minimums for different lot or development sizes. In addition, local governments may take a carrot and/or stick approach in which they require minimum standards and create incentives for those projects that exceed the minimums.

### EFFECTS

Municipalities have much to gain by increasing the tree canopy. Carbon dioxide is one of



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Launching with:  
250 recommendations  
across 32 subchapters

**Launch: §1.1 Climate Change & §1.3 Sensitive Land and Wildlife Habitat  
Year 1 (7 subchapters)**

§ 4.3 Pedestrian Mobility

2-3  
months

§ 7.2 Solar Energy

4-5  
months

§ 6.2 Food Production and  
Security Systems

6-7  
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§ 3.1 Development  
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months

**Year 2 (12 subchapters)**

§ 4.1 Complete Streets / Safe Streets

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§ 2.1 Floodplain and  
River Corridor Land Use

6-7  
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§ 1.7 Urban Forestry  
and Vegetation

*(JR's class, could be a different chapter)*

8-9  
months

*???? (in discussions with U of I  
and Albany for  
additional commitment, Pace?)*

10-12  
months



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## AROUND THE TOWN

See What Other Communities Are Doing



SEPTEMBER 24, 2018

### Ventura County, CA: Native Trees

Within the coastal zone of Ventura County developers are required to protect trees and/or mitigate tree loss in order to preserve their ecological value and visual quality. [1] Keeping in place all protected trees is the most preferred approach pursuant to this ordinance, followed by on-site mitigation, off-site mitigation, and, finally, in-lieu fees.[2] When removal of a protected [...]



SEPTEMBER 24, 2018

### Denver, CO: Green Roofing

Denver's Denver Green Roof ordinances requires the construction of green roofs for new buildings over 25,000 square feet, and for existing buildings at least 25,000 square feet when the building requires a roof replacement. The code defines a green roof as an extension above the roof, which allows vegetation to grow. The portion of the [...]



SEPTEMBER 24, 2018

### Los Angeles, CA: Maximum Size of Single-Family Residences

In 2017, Los Angeles revised its zoning ordinance and FAR calculations to combat the rise of McMansions.[1] The 2017 ordinance changed the way that the FAR is calculated in residential zones. Any



SEPTEMBER 21, 2018

### Spur, TX: Allow Tiny Homes

The City Council of Spur, Texas proclaimed it was the first tiny home friendly town in the nation in July of 2014.[1] The Council realized the popularity of tiny homes due to the economic feasibility and freedom associated with

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