

CHAPTER NINE: SUSTAINABILITY

9.1 OVERVIEW AND VISION

This chapter identifies sustainability principles and implementation measures. Goals and policies contained in the Dunnigan Specific Plan (DSP) guide the conservation, protection and mitigation of natural resources through a sustainable approach to development. The DSP implements sustainable practices through policies, actions, design requirements and implementation strategies as presented in various chapters in the Specific Plan. This chapter addresses four key areas: community connectivity, energy efficiency/renewable energy, water conservation/quality, and recycling. The discussion of energy efficiency/renewable energy includes an overview of the Countywide Climate Action Plan (CAP) and describes how the DSP is consistent with and implements the CAP. This chapter also provides an overview of the sustainability measures which are contained within the Dunnigan Green Building Site Standards (DGBSS), Appendix C.

9.2 GOALS AND POLICIES

Goals and policies from the General Plan guide the sustainability principles and implementation strategies set forth in this chapter. The following is a partial list of key goals and policies that emphasize the sustainability strategies for Dunnigan as outlined in this chapter. General Plan policies related to green building measures and design criteria are more fully addressed in the DGBSS. Goals and policies may be cross referenced from other chapters due to applicability in several areas.

Goal CC-4: Require project design that incorporates “smart growth” planning principals and “green” building standards that reflect the County’s commitment to sustainable development.

- *Policy CC-4.1: Reduce dependence upon fossil fuels, extracted from underground metals, minerals and other non-renewable resources by requiring projects to take advantage of shade, prevailing winds, landscaping and sun screens to reduce energy use, encourage projects to use regenerative energy heating and cooling source alternatives to fossil fuels encouraging projects to select building materials that require less energy-intensive production methods and long distance transport, in compliance with LEED or equivalent standards.*
- *Policy CC-4.4: Encourage new construction to be zero net energy by combining building energy efficiency design features with on-site clean distributed energy so as to result in no net purchases from the electricity or gas grid.*
- *Policy CC-4.5: Encourage individual and community-based wind and solar energy systems.*
- *Policy CC-4.6: Encourage all new residences to exceed Title 24 energy standards by at least 15%, and encourage all new commercial buildings to exceed Title 24 by at least 20%.*
- *Policy CC-4.7: Require energy efficient design for all buildings.*
- *Policy CC-4.10: Require project design to demonstrate adherence to sustainable and neo-traditional design as described in the Ahwahnee Principals and as provided in the SACOG Blueprint, including any amendments or successor documents thereto.*
- *Policy CC-4.12: Require “green” design, construction and operation.*



Goal CO-7: Promote energy efficiency and conservation.

- *Policy CO-7.4: Require the use of Energy Star certified appliances, such as water heaters, swimming pool heaters, cooking equipment, refrigerators, furnaces and boiler units where feasible.*
- *Policy CO-7.6: Encourages the use of building materials and methods that increase energy efficiency a minimum 15% beyond State Title-24 standards for residential buildings and 20% beyond State Title 24 standards for commercial buildings.*

9.3 SUSTAINABILITY THRESHOLDS

The DSP has incorporated an extensive number of sustainability concepts and practices in the approach to land use, circulation, public utilities, public services and environmental resources. The compilation of sustainable concepts has resulted in the DSP land use design and framework which embodies the 5 D's of smart growth: design, diversity, density, destination accessibility and distance to transit, as more fully discussed in Chapters 3 and 4. Building upon the foundation of this "smart" growth land use plan, the addition of the following measures and programs will result in a sustainable, eco-aware community which grows responsibly while enhancing and respecting the local, County-wide, State and global efforts to reduce the impacts of climate change.

9.3.1 Community Connectivity

A strong sustainability attribute of the DSP is the incorporation of the community-wide connectivity principal. Significant emphasis has been made to ensure that the community is linked by the physical framework of the buildings and the infrastructure, which is reflected in the proximity of uses to each other, the trail and bikeway network, street system and transit system. In addition, Dunnigan will operate a community-based telecommunications network platform, which will provide internet hardware throughout the DSP. This "smart connectivity system" (SCS) will network the community on three levels: in homes, workplaces, and public/governmental facilities. The SCS enhances sustainability by supporting the technology for many of the energy and water efficiency monitoring systems, such as smart meters and irrigation controllers, weather stations, as well as providing the platform for residents, business owners, workers and students to share and obtain information such as community activities, carpools, bike-pools, ride-sharing and bus schedules. The platform will aid in energy and fuel efficiency, VMT reduction and enhance sustainability by connecting people to people, people to machines, and machines to machines.

The DSP will provide the communications hardware as backbone infrastructure, and once in place, existing and future connectivity applications can simply be added and run by this backbone system. The SCS will be operated by the Dunnigan County Service Area (CSA). Homes, offices, commercial buildings, schools, governmental/ public agencies and other permitted entities can then connect to either the residential or commercial platform. These platform applications can then be programmed to support many of the sustainable components as discussed in greater detail in the sub-sections below.

9.3.2 Energy Efficiency/Renewable Energy

The DSP incorporates advanced energy efficiency measures and renewable energy resources, which will reduce dependence on non-renewable energy and energy-related greenhouse gas (GHG) emissions. Specifically, GHG emissions will be reduced by lowering energy demand, improving water and energy efficiency, and increasing the amount of electricity and heat generated from renewable energy sources. The Yolo County Climate Action Plan (CAP), adopted in March 2011, is a program of strategies and measures that are expected to reduce GHG emissions and contribute to regional and State climate protection efforts. These strategies have been incorporated into the Dunnigan Specific Plan, predominantly in the areas of energy efficiency, as shown in Table 9.1.

All new buildings constructed in Dunnigan will feature smart energy meters, photovoltaic systems, solar hot water heaters, Energy Star appliances, and green design and construction methods. The DGBSS (Appendix C) were developed to comprehensively implement the sustainability goals of the Specific Plan, as well as the mandatory measures of the CAP. Application of the DSP building and site standards, along with the updated portions of the County Building Code, will result in a smart, green community. In addition, the Dunnigan CSA will advance the County's efforts to launch a Community Choice Aggregation program for supplying renewable energy to users within the Dunnigan and the County at large. While commercial wind energy generation is not specifically proposed within the DSP, the Development Standards allow small-scale wind energy systems as permitted uses within some zones of the Plan Area.

9.3.3 Water Conservation/ Quality

Water conservation is an important element of sustainability and has been addressed at all levels of development of Dunnigan. The specific conservation measures related to water conservation in building construction and site work are addressed in the DGBSS, Appendix C. The goal of this program is to reduce water use through a combination of measures, including use of advanced plumbing fixtures, high efficiency irrigation systems, water use monitoring systems for building use, and rain water harvesting systems. Recycled water from the Title 22 wastewater treatment plant will provide irrigation to public parks and open space, private front yards



Example of an LID swale

of single family lots and landscape medians. Refer to Appendix C for the specific water conservation implementation measures.

Water quality is an equally important measure for a sustainable community. The comprehensively designed drainage system, lakes and low impact design (LID) methods are key components of long-term sustainability to reduce levels of sediment and pollutants in

stormwater and to reserve areas for ground water recharge. Wetland water quality features are designed to collect urban runoff and retain it long enough for the majority of the pollutants to be removed. Lake water quality is further enhanced by the use of submergent and emergent wetland vegetation located along the lake edge and bio-filters. Refer to Section 5.6 for the details of the drainage system and lakes and to the DGBSS Appendix C for LID measures.

9.3.4 Recycling

The Dunnigan Community will reduce the amount of solid waste by promoting aggressive waste prevention and recycling activities. The Dunnigan CSA shall promote the development of environmentally and economically sound practices regarding the collection, processing and end-use of recyclable material and compostable material. The principles of the DSP Recycling Program are as follows:



Typical Recycling Station

- To promote community awareness in order to achieve high rates of participation in the solid waste and recycling collection system.
- To target reductions in toxic waste, to minimize its harmful effects and to reduce greenhouse gas emissions.
- To ensure the safe and sanitary collection, transportation and recovery of solid waste, recyclable and compostable materials.
- To provide Dunnigan residents and businesses the opportunity to recycle more materials through convenient on-site, curbside and depot collection programs and through the addition of recyclable materials to the curbside collection program as appropriate.
- To establish and enforce solid waste, recyclable and compostable material collection standards to ensure uniform, cost-effective and high-quality service delivery to all residential customers.
- To enhance solid waste reduction and recycling in the multifamily, commercial, institutional and industrial sectors by ensuring that comprehensive recycling systems are provided at every establishment not covered by the residential franchise, and to encourage extensive use of those systems by all employees.

The Dunnigan CSA will prepare and implement a community recycling program in cooperation with Yolo County Integrated Waste Management Division (DIWM). The recycling plan outline will be submitted and approved by DWIM prior to recordation of the first final map. The concepts for a community-based recycling program include “free-cycle” fairs and rummage sales for commonly needed items such as: clothes; tools; home repair/gardening equipment; books, toys and children’s items; and electronic waste collection/fundraisers. Recycling will include composting collection and mulch distribution as part of the community gardening program. The recycling program shall be in place before the start of Phase 2.

9.3.5 Climate Action Plan (CAP)

The 2030 Yolo County General Plan includes Action CO-A117, which directed the County to develop a Climate Action Plan in order to reduce greenhouse gas (GHG) emissions and to address economic and social adaptations to the effects of climate change. Yolo County seeks to reduce GHG levels to the following levels by implementing the CAP:

- 1990 levels by 2020 (mandatory target)
- 27% below 1990 levels by 2030 (goal)
- 53% below 1990 levels by 2040 (goal)
- 80% below 1990 levels by 2050 (goal)

9.3.5.1 CAP Implementation Program

The DSP implements the Yolo County CAP through the smart growth principles described in this Specific Plan. In particular, the Transportation and Land Use Measures of the CAP are implemented by the VMT Reduction Measures described in Section 4.10 of Chapter 4.

In order to comply with the CAP, the DSP incorporates applicable strategies and measures as requirements of development. Table 9-1 identifies the measure and the implementing tool that will be used to verify compliance with each of the applicable measures. Most of the measures apply to new development and are mandatory, while some measures that apply to existing development are voluntary. If a measure or measures are determined to be infeasible, then the applicant/landowner shall propose alternative design components, operational protocols and/or verifiable and enforceable offsets to achieve the targeted GHG reductions. Compliance with the CAP shall be monitored by the Planning and Public Works Department.

9.3.6 Green Buildings and Site Standards

General Plan goals and policies provide significant guidance for achieving a high standard of sustainable development for Dunnigan. With guidance from the General Plan, the CAP and available technologies, the Dunnigan Green Building and Site Standards (DGBSS) were developed as a comprehensive tool to guide new construction. In summary, these standards incorporate the mandatory provisions of the Cal Green 2010 State Building Code, the mandatory provisions of the CAP and additional measures specific to the DSP. The DGBSS, found in Appendix C, address planning and design, energy efficiency, water efficiency and conservation, materials conservation and resource efficiency and environmental quality.

Table 9-1 Applicable Climate Action Plan (CAP) Measures

Measure #	Measure/Action	New(N) or Exist'g(E)	Mandatory (M) or Voluntary(V)	Compliance Tool ¹
T-1	Reduce VMT in Dunnigan			
	Achieve GP threshold of 44 VMT or less, per weekday, per household	N	M	MM
E-2	Reduce energy consumption in <u>existing</u> residential and non-residential buildings			
	Residential and commercial buildings complete energy efficiency retrofit with average energy improvement of 15-20%	E	V	PG&E
E-3	Reduce energy consumption in <u>new</u> residential and non-residential buildings			
	All new residential and non-residential buildings to exceed Title 24 by 15% (Tier 1) (Policies E1.1, E1.4, E2.1, and E2.4)	N	M	YCBC
	All new residential homes over 3,500 s.f. achieve exemplary (Tier 2) performance (2020) (Policy E1.2), and at least 12% of residential units achieve exemplary performance (2030) (Policy E2.2)	N	M	YCBC
	At least 0.5% of residential units are zero-net energy (2020) (Policy E1.3), and at least 2% of residential units are zero-net energy (2030) (Policy E2.3)			YCBC
	Encourage commercial users to exceed Title 24 by 30% (Tier 2) or higher by selling credits for emissions reductions	N/E	V	YCBC
E-4	Increase on-site renewable energy generation to reduce grid demand			
	Require solar hot water heaters for all new residential (excl. affordable) and commercial bldgs.	N	M	YCBC
	Require rooftop photovoltaic (pv) for all new residential (excl. affordable) and commercial bldgs.	N	M	YCBC
E-6	Reduce water consumption in existing residential and commercial buildings			
	Encourage water efficiency for existing buildings thru technical assistance, efficiency audits, rebates	E	V	DG
E-7	Reduce landscape water consumption thru use of weather based irrigation and water management			
	All irrigation controllers to be weather based	N	M	YCBC
	Limit turf to maximum of 25% of front yards of new residential development	N	M	YCBC
Support Measures	Additional measures from the CAP to be considered in the DSP			
Energy-1	Pursue a district energy program in high density mixed use developments	N	V	PG&E
Energy-2	Encourage Industrial Process Energy Efficiency	N/E	V	PG&E
Waste-1	Increase natural stormwater retention thru LID	N	M	DG

1. Key for compliance tool: YCBC- Yolo County Building Code, DS- DSP Development Standard, DG- DSP Design Guidelines, MM- DSP Mitigation Measure, PG&E- Pacific Gas & Electric Co.