City of Dublin

General Plan

Chapter 13

ENVIRONMENTAL RESOURCES MANAGEMENT: ENERGY CONSERVATION ELEMENT

13.1 INTRODUCTION

13.1.1 THE NEED FOR ENERGY CONSERVATION

Increasing energy efficiency and the availability of renewable energy has immense potential to both reduce greenhouse gas (GHG) emissions and preserve resources. The energy needed to heat, light, and power buildings within the community is a direct source of GHG emissions. The reduction of GHG emissions is a cornerstone of the City's adopted Climate Action Plan and a key goal of the City in the coming years. Reductions in energy use can be achieved in a variety of ways, which include optimizing energy efficiency in new construction; retrofitting existing buildings to reduce energy consumption; promoting energy and water conservation and efficiency; and advancing the use of renewable energy. Other methods to increase community energy efficiency include subsidizing energy management services such as energy audits for residents and businesses and ensuring that developers and building contractors are trained on energy conservation and efficiency.

There are many agencies – both regulatory and service agencies – that play a role in increasing energy efficiency and decreasing energy consumption at the local level. These agencies include governmental organizations such as the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and the energy provider in the City of Dublin: Pacific Gas and Electric (PG&E).

The CPUC's 2011 California Energy Efficiency Strategic Plan envisions that, by 2020, California's local governments will be leaders in using energy efficiency to reduce energy use and global warming emissions both in their own facilities and throughout their communities. The CPUC sees local governments taking a very active role in enabling the market transformation to greater energy efficiency through efforts to provide both incentives, as well as regulatory requirements to mandate decreased energy consumption.

The City of Dublin does not control the supply or the delivery of energy to customers, nor does the City control cost and pricing mechanisms related to energy supply and delivery. However, the City works in collaboration with the agencies and organizations that provide and support these services, and therefore the scope of the Energy Conservation Element reflects this reality. The City's influence extends mainly to promoting and encouraging sustainable and reliable energy generation, supporting the education efforts of other agencies, and promoting energy conservation among business and residential users. The Energy Conservation Element is intended to guide these efforts.

13.1.2 PURPOSE

The primary purpose and reason for including this optional element in the Dublin General Plan is to ensure that the City is taking an active role in encouraging and promoting energy conservation at every level, and to consolidate information and polices related to energy supply, current conservation programs, and opportunities for future improvements.

13.1.3 RELATIONSHIP TO OTHER GENERAL PLAN ELEMENTS AND OTHER CITY DOCUMENTS

California Government Code Section 65302 requires a General Plan Land Use Element that includes the location and extent of various land uses and a Conservation Element that addresses certain key topic areas. Government Code Section 65301(a) allows a legislative body to adopt a General Plan with any additional elements in any format deemed appropriate or convenient.

The Energy Conservation Element has been developed to be consistent with, and complementary to, other General Plan Elements. References to policies in other Elements are provided where they support or implement the objectives of the Energy Conservation Element.

Other relevant City policy documents that address energy conservation include the 2013 Climate Action Plan Update, Dublin Green Plan (approved in 2011), the Energy Action Plan (completed in 2012), and the City's Green Building Code.

13.1.4 SCOPE AND ORGANIZATION

The Energy Conservation Element is organized as follows:

Section 2 reviews the Legislation and the Regulatory Environment, Energy Supply, Energy Demand, and Energy Efficiency and Conservation Efforts (both underway and planned for the future).

Section 3 includes the City's guiding and implementing policies for Energy Conservation in Existing Development, New Development, and Public Facilities.

13.2 BACKGROUND

13.2.1 KEY LEGISLATION AND THE REGULATORY ENVIRONMENT

The regulatory environment for energy use can generally be divided into two categories: energy supply and energy use/conservation. Salient legislation is described briefly below, which explains what is required by mandate and offers insight into why Dublin has some of the ordinances and requirements that it does.

Energy Supply Legislation

Senate Bill 1078, Senate Bill 107, and Executive Order S-14-08—the Renewables Portfolio Standards. In 2002, the California Senate passed SB 1078 requiring public utilities to gradually increase the percentage of their energy supply generated from renewable sources, reaching 20% renewable content by 2017. SB 107 accelerated the time frame of SB 1078 for it to take effect in 2010. In November of 2008, Executive Order S-14-08 was signed, which increased the amount of renewable power generation to 33% by 2020. Renewable energy could include wind, solar, geothermal, or any "Renewables Portfolio Standard (RPS)-eligible" sources. This means that, over time, an increasingly larger share of the energy provided to homes and businesses in the City of Dublin will be generated with clean power.

Assembly Bill 811, the Property Assessed Clean Energy (PACE) bill. The passage of this bill authorized all California cities and counties to designate areas within which willing property owners could enter into contractual assessments to finance the installation of distributed renewable energy generation, as well as energy efficiency improvements, that are permanently fixed to the property owner's residential, commercial, industrial, or other real property. These financing arrangements allow property owners to finance renewable generation and energy efficiency improvements through low-interest loans that would be repaid as an item on the property owner's property tax bill.

Assembly Bill 117, Community Choice Aggregation. Signed into law in 2002, Assembly Bill 117, also known as Community Choice Aggregation (CCA), enables California cities and counties that form a joint powers authority to provide electricity to customers within their jurisdiction(s). Unlike a municipal utility, the CCA administrator is responsible for choosing the source of the power supplied to CCA customers, but does not deliver that power to customers. Instead, the investor-owned utility, e.g. PG&E, is required to deliver the power to CCA customers over their transmission and distribution lines, charging CCA customers for this service. Under AB 117, the investor-owned utility is also required to provide metering, billing and collection services to CCA customers.

Energy Use and Conservation Legislation

Assembly Bill 32, the California Global Warming Solutions Act of 2006. The passage of this bill in 2006 amplified the need for intensive energy efficiency efforts across California. The California Air Resources Board's (CARB) Draft Scoping Plan for Assembly Bill (AB) 32 implementation states that while "California has a long history of success in implementing regulations and programs to encourage energy efficiency . . . [it] will need to greatly expand those efforts to meet our greenhouse gas emission reduction goals." The Scoping Plan is currently being revised at the State level.

Title 24. Title 24 of the California Code of Regulations is a statewide standard applied at the local level by local agencies through building permits. It mandates how each new home and business is built in California. It includes requirements for the structural, plumbing, electrical, and mechanical systems of buildings and for fire and life safety, energy conservation, green design, and accessibility in and around buildings. For purposes of this element, the most applicable parts of Title 24 are Part 6 (the California Energy Code) and Part 11 (the California Green Building Standards Code).

Executive Order S-20-04 – Energy Efficiency in State Buildings. Executive Order S-20-04 was signed July 27, 2004, and directs the State to commit to aggressive actions to reduce the electricity use of state buildings by implementing cost-effective energy efficiency and green building strategies. To this end, the executive order directs all facilities owned, funded, or leased by the State (and encourages cities, counties, and school districts as well) to take measures to reduce grid-based energy purchases by 20% by 2015. This is to be done through cost-effective measures to increase energy efficiency and distributed generation technologies. These measures include designing, constructing, and operating all new and renovated facilities owned by the State and paid for with State funds as buildings certified "LEED Silver" or higher; seeking out office space leases in buildings with a EPA ENERGY STAR rating; and purchasing or operating ENERGY STAR electrical equipment whenever cost-effective.

13.2.2 ENERGY SUPPLY

Electricity

The City's electric power is supplied by a combination of private suppliers which sell power to PG&E for resale. It is PG&E's distribution system that provides electricity directly to the residential and commercial customers. The electricity is transported via a network of high-voltage transmission lines. Most electric power is brought to electric substations in the region via transmission lines connected to the statewide grid system. Electric power capacity is looked at on a subregional (rather than citywide) basis. Local electrical capacity is a function of (1) transmission network capacity to bring this power to Dublin and the greater Tri-Valley area, (2) capacity of the local substations to lower the voltages (or step down the power) to deliverable suitable voltage, and (3) the ability of the local distribution network to deliver adequate power to customers.

Natural Gas

Natural gas is a fossil fuel made of decomposed plant and animal material and is usually found near a petroleum reservoir. Natural gas is pumped from the underground reservoir into large transmission pipelines which transport the gas to local distribution pipelines. Some local distribution systems lead to underground storage. These natural gas storage areas are utilized during seasonal peaks. PG&E is the retailer for natural gas, which is delivered via their system directly to residential and commercial customers.

Alternative Sources

Heat and/or light collected from the sun produces solar energy. Common uses of solar energy are solar water heating systems, which use the sun to heat water, and photovoltaic facilities, which convert sunlight into energy. The climate in the East Bay, and more specifically in the Tri-Valley, is quite suitable for the implementation of solar energy technologies.

In early 2014, PG&E reached an important milestone – the utility delivered 22.5 percent of its power from eligible renewable resources. The utility is continuing to add more renewable energy to the power mix under California's renewable portfolio standard and is expected to reach 33 percent renewables by the end of 2020. PG&E is investing in a range of clean energy resources such as solar, wind, geothermal, biomass and small hydroelectric power.

In addition to more alternative sources being used by the utility provider, individual properties are increasingly generating their own power and drawing less off the grid. Every year, solar water heating systems are installed in Dublin homes, most often to heat pools. However, there have also been a number of large-scale solar installations on non-residential buildings, most notably at the Alameda County Santa Rita Jail, which has a solar energy system of 1.14 Megawatts. The system covers approximately three acres of the jail's roof, and, at the time it was installed, was the fourth-largest solar photovoltaic system in the world. Additionally, Carl Zeiss, the Dublin Ranch Golf Club Homeowners Association, American Swim Academy, Downtown Safeway, and Big O Tires all have solar installations that offset – or in some cases, provides all – the power needed to the business.

Wind energy is also a viable option in Dublin, which has conditions that are conducive to energy derived from this source. There are no wind energy facilities in the City, although the installation of small wind turbines is currently being considered on a few different commercial project sites.

13.2.3 ENERGY CONSUMPTION

In 2013, the City's Climate Action Plan was updated. The document contained data on the total energy consumption in Dublin, as shown in Table 13.1, below:

Table 13.1 | ENERGY CONSUMPTION IN 2010

SECTOR	ELECTRICITY CONSUMED	NATURAL GAS CONSUMED
Residential	100,679,670 kWh	Not reported
Commercial/ Industrial	178,203,608 kWh	Not reported
City-owned facilities	2,566,566 kWh	50,604 therms
Public lighting (street lights, traffic signals)	2,696,580 kWh	None

Source: Climate Action Plan Update (2013)

Notes: **kWh** = Kilowatt (power equal to 1,000 watts) hour
Therm = a unit of heat is equal to 100,000 British thermal units (BTU)

The Climate Action Plan noted that, between 2005 and 2010, residential electricity use increased by 11%, residential natural gas use increased by 16%, commercial and industrial electricity use decreased by 2%, and commercial and industrial natural gas use increased by 13%. However, these increases roughly correlate with the 21% increase in population that Dublin experienced in the same five-year period.

13.2.4 ENERGY CONSERVATION AND EFFICIENCY

- The City of Dublin currently utilizes several means to promote energy conservation and efficiency in new and existing buildings:
- Implementation of Chapter 7.94 of the Municipal Code (Dublin Green Building Code), with the purpose of enhancing the design and construction of buildings and encouraging sustainable construction practices in several categories including water efficiency and conservation. The Green Building Code was adopted in 2009 and requires residential projects over 20 units to reach 50 points on the GreenPoint Rated system. Alternatively, LEED for Homes, or another equivalent rating system, can be utilized if approved by the Building Official. The majority of new residential projects within the City are subject to the Green Building Ordinance. There are few to no planned residential projects within the City that are 20 units or less.
- Implementation of the 2013 California Green Building Standards Code, also known as the "Cal Green" Code, which was adopted by the City and became effective January 1, 2014.

This code requires efficiency measures to reduce energy use, water consumption, and will encourage alternate means of transportation, which will also provide energy reduction benefits.

- Participation and collaboration with outside organizations and agencies on programs to educate the public and provide hands-on assistance to increase energy conservation efforts such as:
    a. Supporting the StopWaste-initiated Energy Upgrade California program, which has been established throughout Alameda County to support retrofitting existing buildings to increase energy efficiency, water and resource conservation, and improve indoor air quality and health. The program provides a standardized countywide approach that identifies specific green retrofits to improve existing buildings. The City supports and continues to promote the program.
    b. Promoting solar installation within the community by providing information for businesses and residents with information to help make decisions about investing in a photovoltaic (PV) solar system. Furthermore, the City is a participant in the CaliforniaFIRST program, which provides access to financial assistance for business owners seeking to install PV systems.
    c. Partnering with Rising Sun Energy Center to promote energy conservation and sustainable living via a youth employment program, known as California Youth Energy Services (CYES). The CYES program is a youth and young adult summer employment and training program open to those who are 15–22 years old. The CYES program trains and employs local youth to provide resource conservation audits and retrofits to local residences in the form of a Green House Call.
    d. Promoting the use of PG&E's online MyEnergy tool, which allows users to track their personal energy use and adopt behaviors that reduce energy use. By using the tool, residential and commercial customers in Dublin can easily monitor the energy use of their home or office, compare the energy use of their building to that of similar buildings, and set goals for personal energy reduction. MyEnergy also provides users with ways to reduce energy use with little or no cost.
- Implementation of the City's reduced building permit fee for the installation of photovoltaic systems as an incentive for property owners to install solar electricity generating capacity on their homes and businesses.
- Implementation of the LED streetlight specification that requires all new development projects to install LED streetlights.
- Retrofitting existing parks with new irrigation controllers that link to a centralized irrigation system that downloads daily weather reports from a local weather station and adjusts the amount of irrigated water applied to each park each day.

The City is also committed to energy conservation to the greatest degree possible in City-owned public facilities such as community buildings and parks. In May 2011, with the help of Chevron Energy Solutions (Chevron ES), the City conducted an energy audit of all City facilities. From that audit, several recommendations were made for projects that would incorporate energy conservation measures as well as renewable energy options. Specifically, the Chevron ES evaluation examined the

potential for the following types of energy efficiency and alternative energy measures:

- Lighting fixtures and controls
- Building automation and controls
- Air-handling systems
- Equipment modifications
- Heating, cooling and ventilation (HVAC) replacement and/or upgrades
- Street lighting technologies
- Alternative energy production including photovoltaic systems and fuel cells
- Water irrigation systems

As a result of the audit, the City invested in energy efficient upgrades to the following facilities:

Street Lights – Citywide: Over 3,100 fixtures have been retrofitted. The high-pressure sodium cobra head lamps have been exchanged for energy-efficient LED streetlights. This conversion has benefited both the City's public safety responders as well as the public with improved lighting quality and reduced energy usage;

Dublin Civic Center: Installation of a 400 kW solar photovoltaic parking lot canopy system reduces site kWh consumption by 52%, HVAC improvements, window film application to reduce heat absorption, and interior/exterior lighting upgrades;

Dublin Library: Installation of a 200 kW solar photovoltaic parking lot canopy system reduces site kWh consumption by 52%, HVAC improvements, and lighting control improvements;

Shannon Community Center and Park: Installation of a 100 kW ground-mounted solar photovoltaic system reduces site kWh consumption by 66%, HVAC improvements, and interior/exterior lighting upgrades;

Fire Station 16: Installation of a 25 kW roof-mounted solar photovoltaic system reduces site kWh consumption by 40%, HVAC improvements, and interior/exterior lighting upgrades;

Fire Station 17: Installation of a 17 kW ground mounted solar photovoltaic system reduces site kWh consumption by 32% and interior/exterior lighting upgrades;

Fire Station 18: Installation of a 14 kW ground mounted solar photovoltaic system reduces site kWh consumption by 37% and interior/exterior lighting upgrades;

Dublin Aquatic Center: Installation of a 59 kW ground-mounted shade canopy solar photovoltaic system reduces site kWh consumption by 46%, solar thermal covers for the pool, upgraded pool pumps, and interior/exterior lighting upgrades; and

Dublin Senior Center: Installation of a 33 kW roof-mounted solar photovoltaic system reduces site kWh consumption by 26% and interior/exterior lighting upgrades.

In addition to modifications to existing facilities noted above, the City has been aggressive in utilizing energy-efficient appliances and features in the construction of new civic buildings and when remodeling existing facilities. For example, the reconstructed Shannon Community Center, completed in February 2009, was designed and constructed to LEED Silver certification standards, and included several energy conservation elements that contributed to that effort.

13.3 GUIDING AND IMPLEMENTING POLICIES

In implementing the policies below, City Staff and decision-makers will consider the potential negative impacts of clean technology when considering the appropriateness of its application.

13.3.1 ENERGY EFFICIENCY AND CONSERVATION IN EXISTING DEVELOPMENT

A. Guiding Policy

1. Educate Dublin residents and business owners/managers on the variety of energy programs available.
2. Encourage energy efficient improvements be made when residential and commercial properties change ownership.
3. Explore additional ways to support solar and wind power generation options.

B. Implementing Policies

1. The City shall continue to play an active role in educating residents and businesses about the various programs, tools, and incentives of the various agencies and organizations whose main function is to encourage and enable energy conservation. The City can continue to promote energy saving behaviors through information on the City website, tabling at public events, and by promoting competitions to reduce energy use between neighborhoods, among other strategies.
2. Encourage businesses and homeowners to participate in energy audits sponsored by PG&E. These efficiency reviews serve to educate the business owner/resident/homeowner and energy-efficiency strategies and provide information on energy efficient upgrades that may be necessary or desirable. The City could consider highlighting successful case studies on the City's website or in newsletter(s).
3. Encourage property owners and managers of commercial and multi-family residential buildings and sites to examine the outdoor lighting needs for their sites to determine if adjustments can be made and/or retrofits can be done to reduce lighting intensity (as appropriate) and utilize the most efficient fixtures.
4. The City could consider highlighting successful case studies, award programs, and other types of support for business owners/residents/homeowners making energy efficient upgrades to their buildings.
5. Consider creating energy efficient home/business contests to encourage the involvement and participation in energy-efficient upgrades.
6. Create a City-wide solar map to educate businesses and residences about the solar potential of their properties.
7. Consider creating a recognition program for commercial or residential projects that install large-scale solar or wind energy systems and to publicly commend and acknowledge

businesses or individuals that construct or remodel buildings that save more energy than required by *Title 24* or by the Cal Green Building Code.

8. Continue to implement parking lot tree planting standards that would substantially cool parking areas and help cool the surrounding environment. Encourage landscaping conducive to solar panels in areas where appropriate.

13.3.2 ENERGY EFFICIENCY AND CONSERVATION IN NEW DEVELOPMENT

A. Guiding Policy

1. Encourage the installation of alternative energy technology in new residential and commercial development.
2. Encourage designing for solar access.
3. Encourage energy efficient improvements be made on residential and commercial properties.

B. Implementing Policies

1. New development proposals shall be reviewed to ensure lighting levels needed for a safe and secure environment are provided—utilizing the most energy-efficient fixtures (in most cases, LED lights)—while avoiding over-lighting of sites. Smart lighting technology (e.g. sensors and/or timers) shall also be employed in interior and exterior lighting applications where appropriate.
2. New development projects shall install LED streetlights in compliance with the City's LED light standard.
3. In new commercial and residential parking lots, require the installation of conduit to serve electric vehicle parking spaces to enable the easier installation of future charging stations.
4. Encourage the installation of charging stations for commercial projects over a certain size and any new residential project that has open parking (i.e. not individual, enclosed garages).
5. Encourage buildings (and more substantially, whole neighborhoods) to be designed along an east-west axis to maximize solar exposure. Where feasible, require new development projects to take advantage of shade, prevailing winds, landscaping and sun screens to reduce energy use; and to use regenerative energy heating and cooling source alternatives to fossil fuels.
6. Continue to implement parking lot tree planting standards that would substantially cool parking areas and help cool the surrounding environment. Encourage landscaping conducive to solar panels in areas where appropriate.
7. Promote and encourage photovoltaic demonstration projects in association with new development.
8. Consider creating a recognition program for commercial or residential projects that install large-scale solar or wind energy systems and to publicly commend and acknowledge businesses or individuals that construct or remodel buildings that save more energy than required by *Title 24* or by the Cal Green Building Code.

13.3.3 ENERGY EFFICIENCY AND CONSERVATION IN PUBLIC FACILITIES

The City has demonstrated its commitment to energy efficiency and conservation through the many efforts that have already taken place. The City has made a substantial investment in solar energy installations, updating and upgrading lighting and HVAC systems, and reducing water consumption (with the associated energy savings). The City will continue to be a model for businesses to follow and will continue to engage in efforts to further decrease energy use in public facilities throughout the community through the measures below.

A. Guiding Policy

1. Serve as a model for residents, local businesses, and public agencies by continuing to reduce the City's demand on energy resources.

B. Implementing Policies

1. When new buildings are constructed and when equipment is being replaced at existing buildings, continue to use the most energy efficient lighting, air conditioning, heating, and irrigation systems in City buildings, parks, and facilities.
2. Encourage the design of new City buildings to enable solar access.
3. Design public facilities to incorporate lighting levels needed for a safe and secure environment are provided—utilizing the most energy-efficient fixtures—while avoiding over-lighting of sites. Smart lighting technology (e.g. sensors and/or timers) shall also be employed in interior and exterior lighting applications where appropriate.