

**Initial Cost**

This reduction measure can be implemented as part of the next Zoning Code update. Staff estimates that updating the zoning code with shading requirements (including the shading requirement in the next measure) will take 36 hours of Staff time, which is equivalent to \$1,800 - \$3,600.

**Greenhouse Gas Emissions Reductions**

Based on San Carlos' projected commercial and residential growth rates, we estimate that this reduction measure will result in 900 additional trees within the City by 2030. It is estimated that planting these 900 trees will save 228 metric tons of CO<sub>2</sub>e per year due to known carbon sequestration rates and studied decreases in cooling costs as a result of increased tree canopy.

**8.3. Develop and implement a shading requirement for all City-owned parking lots**

While the City is unable to require existing parking lots and developments to adhere to a shading requirement, it is able to renovate its own parking lots and streets to include more trees. This reduction measure should allow for solar panels to be installed in lieu of trees when they provide equivalent shading.

**Initial Cost**

This reduction measure is more cost intensive than the previous two. According to the Department of Public Works, the cost per tree would be \$1200 per year for watering for the first five years and eight hours a year of maintenance (trimming, debris cleanup, etc.). Averaging these yearly costs, a tree costs about \$10,000 over its lifespan. Assuming 50 trees are planted as a result of this measure, an estimated cost of \$500,000 would be borne over time. However, since maintenance and upkeep costs are not included in the initial cost analysis, this figure is for information only.

Installing trees in existing parking lots is also expensive because half of a parking spot is lost for every tree. This loss of parking invalidates the \$15,000 spent for construction of the parking spot, however this figure will not be included in our total as it is a sunk cost.

Actual costs for developing a shading requirement for City parking lots is combined with the previous measure for a total of 36 hours staff time.

**Greenhouse Gas Emissions Reductions**

It is estimated that a shading requirement for City-owned parking lots would result in 100 new trees within the City of San Carlos. Based on known carbon sequestration rates and studied decreases in cooling costs as a result of increased tree canopy, it is estimated that these 50 trees will save 26 metric tons of CO<sub>2</sub>e per year.

**Table 11**  
**Summary of Energy Use Reduction Measure 8**

	<b>Component</b>	<b>Initial Costs to the City</b>	<b>GHG Reduction (metric tons CO<sub>2</sub>e / year)</b>	<b>Cost per metric ton CO<sub>2</sub>e</b>
1	Support community tree planting programs	\$1,000 - \$22,000	102	\$9.80 - \$215.69
2	Create a shading requirement for all new development	\$1,800-\$3,600	228	\$7.09 - \$14.17
3	Develop a shading requirement for all City parking lots		26	
<b>TOTAL</b>		<b>\$12,800-\$25,600</b>	<b>356</b>	<b>\$35.96 - \$71.91</b>

## Energy Use Reduction Measures – Progress to Date

We are well on our way to achieving the emissions reductions outlined in this chapter. Between our baseline year of 2005 and the development of this Plan in 2009, the City and community have embarked on multiple projects and programs to reduce emissions in the energy sector. These efforts are summarized below and measured in comparison to the overall 2030 energy emission reduction target.

### San Carlos Green Business Program

At the invitation of San Mateo County Supervisor Mark Church and the County's Recycle Works.Org Division, San Carlos became one of 6 cities in San Mateo County to pilot this County's participation in the Bay Area Green Business Program last summer. The program, which started 10 years ago in Alameda County is sponsored by the Association of Bay Area Governments (ABAG) and encourages local businesses of all sizes to adopt Green Business Practices and then to participate in a certification process. Certification involves completing an 11 page checklist, working with your City, local utilities and regulators and the County. Certified Green Businesses receive a Green Business Program window sticker for their firm, Green Business artwork for their web site and a listing in a Bay Area Green Business Guide that now tops 1,000 firms.

To date, 20 San Carlos businesses have earned the Bay Area Certified Green Business designation. Several more are in the process of gaining their Certified Green Business award.

We estimate that this effort to date has reduced **133 metric tons of CO<sub>2</sub>e**, which contributes directly to Reduction Measure 1 – Expand Energy Saving Opportunities to businesses.

### “Greenest City Challenge”

San Carlos won third place nation-wide in the Yahoo! “Greenest City Challenge” in 2007 and received 5,000 compact fluorescent light bulbs (CFLs), which were distributed to residents. Additionally, between 2007 and 2008, San Carlos Green distributed 450 additional CFLs donated by PG&E, along with 200 garden hose nozzles, 100 low-flow shower heads, 200 low-flow sink aerators, and several hundred toilet leak detection tablets donated by California Water Service Company. All devices were accompanied by literature on energy and water conservation.

The LED lightbulbs are estimated to have saved **26 metric tons of CO<sub>2</sub>e**, which contributes directly to Reduction Measure 2 –Improve Residential Energy Efficiency

### The San Carlos Community Solar Program

In 2007, residents were invited to participate in the Community Solar Discount Program in partnership with Solar City and San Carlos Green. The 18 participating residents exceeded the Program's goals, installing 83kW of solar power generation in just three months.

The Community Solar Program is estimated to save approximately **54 metric tons of CO2e per year**, which contributes directly to Reduction Measure 5 - Identify opportunities for on-site renewable energy generation on City and privately-owned property.

## Analysis of Reduction Target – Energy Use

The emissions reductions estimates from energy use are summarized below. As the chart concludes, the eight energy use measures analyzed in this chapter are estimated to reduce energy emissions by approximately 18%.

**Table 12**  
**Summary of Emissions Reductions from Energy Use Reduction Measures**

		Metric Tons CO <sub>2</sub> e per year
<b>Reference year 2030 Energy Use "Business-as-Usual" Emissions</b>		<b>156,135</b>
<b>1</b>	<b>Expand energy saving opportunities to businesses</b>	<b>- 13,300</b>
	1.1. Consider developing a tax rebate program for efficiency improvements in businesses.	
	1.2. Expand energy saving opportunities and assistance for large and small commercial and industrial businesses.	
<b>2</b>	<b>Improve residential energy efficiency</b>	<b>- 3,383</b>
	2.1. Consider establishing energy efficiency standards for new construction and remodel projects that exceed the State's Title 24 energy standards.	
	2.2. Perform energy-efficient lighting retrofits and/or home energy audits.	
	2.3. Expand the distribution of free or subsidized energy and water saving devices and services to the mass market.	
	2.4. Expand and better integrate programs that increase energy efficiency in low-income households.	
<b>3</b>	<b>Adopt a green building standard for all new development and major remodels.</b>	<b>- 9,879</b>
	3.1a. (first option) Enforce State green building requirements and provide information and support to developers on LEED and GreenPoint standards. Vs. 3.1b. (second option) Develop a green building ordinance consistent with that of neighboring jurisdictions that requires a GreenPoint, LEED, or equivalent green building certification per development category.	
<b>4</b>	<b>Create water and waste efficient landscapes.</b>	<b>- 485*</b>
	4.1. Formalize the City's efficient landscaping practice by writing it into the Parks Master Plan.	
	4.2. Expand the current landscaping ordinance to require efficient landscaping in conjunction with all residential and commercial property improvements.	
<b>5</b>	<b>Identify opportunities for on-site renewable energy generation on City and privately-owned property.</b>	<b>- 394</b>
	5.1. Identify opportunities for increasing solar system installations in the community and on City facilities.	

		Metric Tons CO <sub>2</sub> e per year
<b>Reference year 2030 Energy Use "Business-as-Usual" Emissions</b>		<b>156,135</b>
	5.2. Identify opportunities for Wind energy generation.	
	5.3. Identify opportunities for Biomass energy opportunities.	
<b>6</b>	<b>Implement reduction strategies included in the energy audit of City facilities. Continue to monitor City facility performance.</b>	<b>- 160</b>
	6.1. Implement reduction strategies included in the energy audit of City facilities. Continue to monitor City facility performance.	
<b>7</b>	<b>Provide for increased albedo (reflectivity) of all urban surfaces including roads, driveways, sidewalks, and roofs in order to minimize the urban heat island effect.</b>	<b>- 2,320</b>
	7.1. Provide for increased albedo (reflectivity) of all urban surfaces including roads, driveways, sidewalks, and roofs in order to minimize the urban heat island effect.	
<b>8</b>	<b>Encourage tree planting</b>	<b>- 356</b>
	Support community tree planting programs	
	Create a shading requirement for all new development	
	Develop a shading requirement for all City parking lots	
<b>Total Community Energy Use Emissions Reduction</b>		<b>-29,792</b>
<b>California Regional Portfolio Standard (RPS)*</b>		<b>- 31,566</b>
<b>Title 24</b>		<b>- 2,947</b>
<b>Net 2030 Community Energy Use Emissions</b>		<b>91,830</b>
<b>Base Year 2005 Energy Use Emissions</b>		<b>103,797</b>
<b>Percent below 2005 level</b>		<b>11.5%</b>

\* Information Item Only. Greenhouse gas emissions from water filtration, movement, and treatment were not included in the baseline inventory of emissions referenced in this report, therefore these reductions cannot be added to the total reductions from the baseline year.