Appendix F: GHG Mitigation Measures Reduction Chart

This chart is being provided as a general reference for potential reductions of CO2 by applying specific mitigation measures to land use projects. The reductions listed in this chart are derived from an in-depth study by CAPCOA: "Quantifying Greenhouse Gas Mitigation Measures" (August, 2010). Other references are also listed. Please note that the reductions listed may or may not apply to all projects. It is very important that the generalized reductions listed in this chart should NOT be used in place of the more specific quantification.

It is highly recommended that the applicant contact the District in the early planning stages of a project to discuss GHG impacts and how to mitigate those impacts for any specific project.

	MEASURE	DESCRIPTION	% Reduction by Sector
		ENERGY	
E1	LEED Certified Building	All buildings within the project are classified as LEED Certified.	100%
E2	Meet Tier 1 or Tier 2 Building Requirements (CalGreen)	Meets CalGreen state energy standards.	Variable
E3	Install Solar Water Heater	Solar Water Heaters are installed in all homes or commercial structures w/i project.	70% more efficient (2)
E4	Energy Efficient Roofing (Energy Star)	"Energy Star" (or greater) roofing material on all structures w/l project	10-15% red. Peak Demand
E5	Install Tank less or Energy Efficient H20 Heaters	"Tank less" water heaters, or energy efficient water heaters with an external R value of 16, and an efficiency value of 0.65, installed in all homes or commercial structures within the project.	25-30% more efficient (900 lbs/yr)
E6	Install Shading Mechanism for Windows, Doors, etc	Shading mechanisms (i.e., canopies) for windows, doors are installed in all homes w/i project.	BMP (1)
E7	Whole Ceiling House Fans	Whole ceiling house fans are installed in all homes or commercial structures w/i project.	BMP(1)
E8	Efficient Indoor Lighting	Energy efficient indoor lighting installed in all homes or commercial structures w/i project.	BMP(1)
E9	Energy Star Appliances by Bldr.	"Energy Star" appliances (e.g., stoves, dishwashers, etc.) are installed by the builder in all homes w/i project.	2-4% (res)
E10	LED Traffic Lights	All traffic lights required to be installed with the project (on or off site)are to utilize LED	90% more efficient
E11	Install Efficient Street/Area Lights	All street/area lights required to be installed with the project are to be energy efficient.	16-40% more efficient
E12	Pre-Plumb for Solar Energy & design for load	All residences and commercial structures associated with the project are to be pre-plumbed and structurally engineered for future solar energy installation.	BMP(1)
E13	Energy Efficient AC Unit	AC unit which exceeds the Seasonal Energy Efficiency Ratio (SEER) by two points in effect at the time of the building permit submittal shall be installed in each residential dwelling.	BMP(1)
E14	HVAC Duct Sealing	Use mastic on all joints and seams and pressure balance the ductwork system.	30%
E15	Energy Efficient Heating	Include energy-efficiency heating and efficient ventilation methods on all new residential units. Furnaces to be low-NOx with an AFUE of 94 percent.	BMP(1)

E16	Programmable Thermostats	Install programmable thermostat timers in each residence or commercial structure w/I project.	BMP(1)
E17	Install Energy Efficient Boilers	Install energy efficient boilers associated with each land use.	2-18%
		WATER	
W1	Install Low Flow H20 Fixtures	Install low flow, toilets, showers, faucets, etc. in each residence or commercial structure w/I project.	BMP(1)
W2	Install H20 Saving Irrigation	Install H2O saving irrigation such as drip systems, rain shut off valves, etc. (excludes single family residential projects)	6%
W3	Use Reclaimed Water	Use reclaimed water for irrigation or other specific uses (excludes single family residential projects)	0-40%
		TRANSPORTATION	
T1	Bus Shelter	Provide bus shelters within close proximity to project.	0-15%
T2	Bike Lanes	Provide bike lanes which directly connect to regional bike system.	0-9%
T3	Bike Parking	Provide bike parking w/I project boundaries.	BMP(1)
		VEGETATION	
V1	Plant Shade Trees	Plant fast growing, broad leaf shade trees within 40' of the south side of a building & 60' of the west side of a building. (excludes single family residential projects)	BMP(1)
V2	Drought Tolerant Plants	At least 75% of all plant material shall be "draught tolerant."	BMP(1)
V3	Prohibit Gas Powered Landscape Equipment	Prohibit gas powered landscape equipment (electric only) within project boundaries. Include in CC&R's for Single Family Residential projects.	70%

BMPs: These mitigation measures are listed as BMPs since there is not adequate literature at this time to generalize the mitigation measure reductions. However, the project applicant may be able to provide the site specific information necessary to quantify a reduction.

Percentage reductions are not overall reductions in CO_2 for projects. For example, installation of a solar water heater does not reduce the overall project CO_2 emissions by 70%. Rather, there is an approximate 70% reduction of CO_2 by installing a solar water heater vs. a conventional water heater. The 70% reduction is only applicable to that specific measure, not the overall project.

More specific quantification tools, including rules for combining measures, may be found in CAPCOA's "Quantifying Greenhouse Gas Mitigation Measures" which provides mathematical formulas for each measure.