

APPENDIX F. Recommended Operational Mitigation Measures for GHGs

The following mitigation measures are provided as general guidance for the types of measures that could potentially be proposed for land use projects. Please note that these measures may or may not be applicable to any specific project. This appendix is intended to be utilized as a “menu” of potential measures.

Residential

1. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application shall show that the applicant has met all conditions required in order for each residence within the approved subdivision to be certified as a (choose one: Certified / Silver /Platinum) LEED building.
2. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application for each residence within the approved subdivision shall show that each residence shall meet the current [CalGreen](#) (choose one: Tier 1 / Tier 2) requirements in place at the time of Building Permit issuance.
3. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within the approved subdivision shall show that each residence includes a complete solar water heating system.
4. Prior to the issuance of a Building Permit, the floor plans and exterior elevations submitted in conjunction with the Building Permit application, shall show that the applicant has installed _____ [insert number] solar panels or Photovoltaic roofing tiles on _____ [insert number] homes or structures throughout the project as follows: (describe lot numbers, locations, and/or building numbers and locations here).
5. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within the approved subdivision shall show that each residence is “pre-plumbed” and structurally engineered for the future installation of a complete solar energy system.
6. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within the approved subdivision shall show that each residence includes “Energy Star” rated (or greater) roofing materials.
7. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within the approved subdivision shall show that each residence includes a “tank less” water heating system.
8. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within the approved subdivision shall show that each residence includes a whole house ceiling fan.
9. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within

the approved subdivision shall show that each residence includes energy efficient lighting (both indoor and outdoor).

10. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within the approved subdivision shall show that each residence includes "Energy Star" appliances (e.g., stoves, dishwashers, and any other appliances typically included with the initial installation by the builder).
11. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within the approved subdivision shall show that each residence includes an energy efficient AC unit which exceeds the SEER ratio by a minimum of two points at the time of building permit issuance.
12. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within the approved subdivision shall show that each residence includes HVAC duct sealing and that the ductwork shall be pressure balanced prior to the issuance of a certificate of occupancy.
13. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within the approved subdivision shall show that each residence shall include an Energy efficient heating system. Furnaces are to be low NO_x with an AFUE of 94 percent.
14. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within the approved subdivision shall show that each residence shall only utilize programmable thermostat timers.
15. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, for each residence within the approved subdivision shall show that each residence shall only utilize low flow water fixtures such as low flow toilets, faucets, showers, etc.
16. Prior to approval of Improvement Plans the applicant shall only show "LED" type lights for all intersection traffic lights included on the Improvement Plans, including all on-site and off-site traffic lights.
17. Prior to approval of Improvement Plans the applicant shall only show energy efficient lighting for all street, parking, and area lighting associated with the project, including all on-site and off-site lighting.
18. Prior to approval of Improvement Plans the applicant shall include a bus shelter on the Improvement Plans located in the general vicinity as shown on the Site Plan approved for the project.
19. Prior to approval of Improvement Plans the applicant shall include a Class ___ bike lane on the Improvement Plans located in the general vicinity, as shown on the Site Plan approved for the project.

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SF₆
NO_x

Non-Residential

20. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, shall show that the applicant has met all conditions required in order for all structures within the proposed project to be certified as a (choose one: Certified / Silver /Platinum) LEED building.
21. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, shall include provisions for the installation of _____ (choose one: Solar panels / photovoltaic tiles) as indicated in the environmental document for the project.
22. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, shall show that the project includes a complete solar water heating system.
23. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, shall show that the structures within the project are "pre-plumbed" and structurally engineered for the future installation of a complete solar energy system.
24. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, shall show that each structure within the project includes "Energy Star" rated (or greater) roofing materials.
25. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, shall show that each structure within the project includes energy efficient lighting (both indoor and outdoor).
26. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, shall show that each structure within the project includes an energy efficient AC unit which exceeds the SEER ratio by a minimum of two points at the time of building permit issuance.
27. Prior to the issuance of a Building Permit, the plans submitted in conjunction with the Building Permit application, shall show that each structure within the project includes HVAC duct sealing and that the ductwork shall be pressure balanced prior to the issuance of a certificate of occupancy.
28. Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application, shall show that each structure within the project shall include an energy efficient heating system.
29. Prior to the issuance of a Building Permit, the plans submitted in conjunction with the Building Permit application, shall show that each structure within the project shall only utilize programmable thermostat timers.
30. Prior to the issuance of a Building Permit, the plans submitted in conjunction with the Building Permit application, shall show that each structure shall only utilize low flow water fixtures such as low flow toilets, faucets, showers, etc.
31. Prior to approval of Improvement Plans the applicant shall only show "LED" type lights for all intersection traffic lights included on the Improvement Plans, including all on-site and off-site traffic lights.

32. Prior to approval of Improvement Plans the applicant shall only show energy efficient lighting for all street, parking, and area lighting associated with the project, including all on-site and off-site lighting.
33. Prior to approval of Improvement Plans the applicant shall include a bus shelter on the Improvement Plans located in the general vicinity as shown on the Site Plan approved for the project.
34. Prior to approval of Improvement Plans the applicant shall include a Class ___ bike lane on the Improvement Plans located in the general vicinity as shown on the Site Plan approved for the project.

Off-Site Mitigation Measures:

When proposing an off-site mitigation measure for GHG mitigation, the measure should explicitly identify the anticipated GHG emission reductions and the method to implement. The anticipated GHG emission reductions from the mitigation measure implementation should be calculated by one of the following methods;

- 1) if the measure is applied as a feasible measure, the anticipated emission reduction shall be calculated based on the amount of emissions exceeding the thresholds for one year, **or**
- 2) if the measure is applied to support a "less-than-significant" conclusion, the anticipated emission reduction shall be calculated based on the total amount of emissions exceeding the threshold for each year, until the year in which the project's emissions will be equal to the threshold, or for a maximum of 20 years.

The off-site mitigation measure for GHG emissions should be implemented by one of the following methods:

- 1) the applicant can propose their own off-site mitigation project which generates carbon credits equivalent to the anticipated emission reductions and is implemented by an approved protocol from California Air Pollution Control Officers Association (CAPCOA), California Air Resources Board, or other similar entities determined acceptable by the District, **or**
- 2) the applicant can purchase carbon credits from the CAPCOA GHG Reduction Exchange Program³⁸, American Carbon Registry (ACR), Climate Action Reserve (CAR), or other similar carbon credit registry as determined acceptable by the District.

The District encourages the applicant to consider generating or purchasing local and California-only carbon credits as the preferred mechanism to implement the off-site mitigation measure for GHG emissions which facilitates the State to achieve the GHG emission reduction goal. The District will assist lead agencies with reviewing and verifying that the carbon credits, from either the proposed off-site mitigation projects or from the certification of purchase credits from selected carbon credit registries. The District will ensure the credits are retired.

³⁸ CAPCOA Greenhouse Gas Reduction Exchange (GHG Rx). <http://www.ghgrx.org/>



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The following chart is being provided as a general reference for potential reductions of GHG emissions by applying specific mitigation measures to land use projects. The reductions listed in this chart are derived from CAPCOA's "[Quantifying Greenhouse Gas Mitigation Measures](#)" (August, 2010). Other references are also listed. Most of measures have been incorporated into CalEEMod's mitigation analysis and the associated % of GHG reductions for each measure may be changed based on the statewide regulation modification and CalEEMod revision.

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 H2O 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	BMP(1)

E17	Install Energy Efficient Boilers	w/l project. Install energy efficient boilers associated with each land use.	2-18%
WATER			
W1	Install Low Flow H2O Fixtures	Install low flow, toilets, showers, faucets, etc. in each residence or commercial structure w/l project.	BMP(1)
W2	Install H2O 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/l 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 no 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.

The percentage reductions are not overall reductions in CO₂ for projects. For example, installation of a solar water heater does not reduce the overall project CO₂ emissions by 70%. Rather, there is an approximate 70% reduction of CO₂ 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.

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