

# **GREENHOUSE GAS EMISSIONS**

## **Development Review Processes County of San Bernardino, California**

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## Introduction

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The San Bernardino County GHG Emissions Reduction Plan (GHG Plan) includes reducing 159,423 Metric Tons of Carbon Dioxide Equivalents (MTCO<sub>2</sub>e) per year from new development by 2020 as compared to the 2020 unmitigated conditions.

Mitigation of GHG emissions impacts through the GHG Development Review Process (DRP) provides one of the most substantial reduction strategies for reducing external emissions. The DRP procedures for evaluating GHG impacts and determining significance for CEQA purposes will be streamlined by (1) applying a uniform set of performance standards to all development projects, and (2) utilizing Screening Tables to mitigate project GHG emissions. Projects will have the option of preparing a project-specific technical analysis to quantify and mitigate GHG emissions. A review standard of 3,000 MTCO<sub>2</sub>e per year will be used to identify projects that require the use of Screening Tables or a project-specific technical analysis to quantify and mitigate project emissions. The review standard of 3,000 MTCO<sub>2</sub>e per year and the performance standard are described in Attachment 1, and the Screening Tables & methodology are described in Attachment 2, the methodology for determining unmitigated and mitigated emission is described in Attachment 3.

This update of the GHG Emissions Development Review Process updates the language the performance standard (Attachment 1) bringing it up to date with current code, and improves upon the menu of options within the screening tables (Attachment 2) proportioning point values to more accurately account for expected GHG reductions and revised the descriptions of the energy efficiency related options to better describe the physical improvements that would be made in choosing that option.

As part of the implementation of the County GHG Plan, a uniform set of performance standards will be applied to development projects. These performance standards will be added to the County Development Code to ensure consistent application during development review. The complete Development Review Process, including the use of performance standards, for assessing and mitigating GHG emissions is outlined below.

- a) County Performance Standards. All development projects, including those otherwise determined to be exempt from CEQA will be subject to applicable Development Code provisions, including the GHG performance standards, and state requirements, such as the California Building Code requirements for energy efficiency. With the application of the GHG performance standards, projects that are exempt from CEQA and small projects that do not exceed 3,000 MTCO<sub>2</sub>e PER YEAR will be considered to be consistent with the Plan and determined to have a less than significant individual and cumulative impact for GHG

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emissions. (See Attachment 1 hereto, for description of the performance standards and the methodology relating to the 3,000 MTCO<sub>2</sub>e per year level)

- b) Regulatory Agency Performance Standards. When, and if, South Coast Air Quality Management District or Mojave Basin Air Quality Management District adopts standards, the County will consider such guidance and incorporate all applicable standards.
- c) Projects Using Screening Table. For projects exceeding 3,000 MTCO<sub>2</sub>e per year of GHG emissions, the County will use Screening Tables as a tool to assist with calculating GHG reduction measures and the determination of a significance finding. Projects that garner a 100 or greater points would not require quantification of project specific GHG emissions. The point system was devised to ensure to Project compliance with the reduction measures in the GHG Plan such that the GHG emissions from new development, when considered together with those existing development, will allow the County to meet its 2020 target and support reductions in GHG emissions beyond 2020. Consistent with the CEQA Guidelines, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions. (See Attachment 2 hereto, for a full description of the Screening Tables and methodology.)
- d) Projects Not Using Screening Tables. Projects exceeding 3,000 MTY of GHG emissions that do not use the Screening Tables, will be required to quantify project-specific GHG emissions and achieve the equivalent level of GHG emissions efficiency as a 100-point project. Consistent with the CEQA Guidelines, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions. (See Attachment 3 hereto for a description of this alternative GHG mitigation analysis and methodology.)
- e) Residential Projects Located Outside City Sphere of Influence. Residential Projects (or mixed use projects with a residential component) in excess of 250 residential dwelling units that are located in unincorporated area not within a City Sphere of Influence (SOI) will not be eligible to use the Screening Tables or rely on the Plan for a determination of less than significant on individual or cumulative impact for GHG emissions. These projects must perform an independent project-specific evaluation of GHG emissions as described in Attachments 1 and 3 hereto, and present project-specific conclusions regarding significance of GHG emissions impacts. (See Attachments 1 and 3 hereto for a full description of the mitigation analysis and methodology for these projects.)

## Summary

In total, Projects that emit 3,000 MTCO<sub>2</sub>e or more per year are anticipated to reduce a total of approximately 150,600 MTCO<sub>2</sub>e per year as compared to the 2020 unmitigated scenario. To summarize the GHG Reductions:

Performance Standards are expected to reduce	5,282.3 MTCO <sub>2</sub> e per year
Small accessory renewable energy projects are expected to reduce	8,628.0 MTCO <sub>2</sub> e per year
Projects demonstrating consistency with the GHG Plan will reduce	<u>150,600.0 MTCO<sub>2</sub>e per year</u>
Total:	<b>164,510.3 MTCO<sub>2</sub>e per year</b>

Note the anticipated reductions, including those attributable to small accessory renewable energy projects described in Attachment 4 hereto, exceed the GHG Plan reductions required for new development by approximately 5,088 MTCO<sub>2</sub>e per year.

## **ATTACHMENT 1:**

- a. Performance Standards**
- b. Projects Emitting 3,000 MTCO<sub>2</sub>e Per Year or Less**
- c. Residential Projects Outside of City Spheres of Influence**

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## PERFORMANCE STANDARDS

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The GHG reducing performance standards were developed by the County to improve the energy efficiency, water conservation, vehicle trip reduction potential, and other GHG reducing impacts from all new development approved within the unincorporated portions of San Bernardino County. As such, the following Performance Standards establish the minimum level of compliance that development must meet to assist in meeting the 2020 GHG reduction target identified in the in the County GHG Emissions Reduction Plan. These Performance Standards apply to all Projects, including those that are exempt under CEQA, and will be included as Conditions of Approval for development projects.

The following are the Performance Standards (Conditions of Approval) used for Industrial, Commercial and Residential projects in the County:

### **COMMERCIAL AND INDUSTRIAL PROJECTS**

1. GHG – Operational Standards. *The developer shall implement the following as greenhouse gas (GHG) mitigation during the operation of the approved project:*
  - a) Waste Stream Reduction. *The “developer” shall provide to all tenants and project employees County-approved informational materials about methods and need to reduce the solid waste stream and listing available recycling services.*
  - b) Vehicle Trip Reduction. *The “developer” shall provide to all tenants and project employees County-approved informational materials about the need to reduce vehicle trips and the program elements this project is implementing. Such elements may include: participation in established ride-sharing programs, creating a new ride-share employee vanpool, designating preferred parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading for ride sharing vehicles with benches in waiting areas, and/or providing a web site or message board for coordinating rides.*
  - c) Provide Educational Materials. *The developer shall provide to all tenants and staff education materials and other publicity about reducing waste and available recycling services. The education and publicity materials/program shall be submitted to County Planning for review and approval. The developer shall also provide to all tenants and require that the tenants shall display in their stores current transit route information for the project area in a visible and convenient*

location for employees and customers. The specific transit routes displayed shall include Omni Trans Route 8, San Bernardino-Mentone-Yucaipa.

- d) Landscape Equipment. The developer shall require in the landscape maintenance contract and/or in onsite procedures that a minimum of 20% of the landscape maintenance equipment shall be electric-powered.

2. GHG – Construction Standards. *The “developer” shall submit for review and obtain approval from County Planning of a signed letter agreeing to include as a condition of all construction contracts/subcontracts requirements to reduce GHG emissions and submitting documentation of compliance. The developer/construction contractors shall do the following:*

- a) *Implement the approved Coating Restriction Plans.*
- b) *Select construction equipment based on low GHG emissions factors and high-energy efficiency. All diesel/gasoline-powered construction equipment shall be replaced, where possible, with equivalent electric or CNG equipment.*
- c) *Grading contractor shall provide the implement the following when possible:*
- 1) *training operators to use equipment more efficiently.*
  - 2) *identifying the proper size equipment for a task can also provide fuel savings and associated reductions in GHG emissions*
  - 3) *replacing older, less fuel-efficient equipment with newer models*
  - 4) *use GPS for grading to maximize efficiency*
- d) *Grading plans shall include the following statements:*
- *“All construction equipment engines shall be properly tuned and maintained in accordance with the manufacturers specifications prior to arriving on site and throughout construction duration.”*
  - *“All construction equipment (including electric generators) shall be shut off by work crews when not in use and shall not idle for more than 5 minutes.”*
- e) *Schedule construction traffic ingress/egress to not interfere with peak-hour traffic and to minimize traffic obstructions. Queuing of trucks on and off site shall be firmly discouraged and not scheduled. A flagperson shall be retained to maintain efficient traffic flow and safety adjacent to existing roadways.*
- f) *Recycle and reuse construction and demolition waste (e.g. soil, vegetation, concrete, lumber, metal, and cardboard) per County Solid Waste procedures.*
- g) *The construction contractor shall support and encourage ridesharing and transit incentives for the construction crew and educate all construction workers about the required waste reduction and the availability of recycling services.*



3. GHG – Design Standards. *The developer shall submit for review and obtain approval from County Planning that the following measures have been incorporated into the design of the project. These are intended to reduce potential project greenhouse gas (GHGs) emissions. Proper installation of the approved design features and equipment shall be confirmed by County Building and Safety prior to final inspection of each structure.*
- a) Meet Title 24 Energy Efficiency requirements implemented July 1, 2014 *The Developer shall document that the design of the proposed structures meets the current Title 24 energy-efficiency requirements. County Planning shall coordinate this review with the County Building and Safety. Any combination of the following design features may be used to fulfill this requirement, provided that the total increase in efficiency meets or exceeds the cumulative goal (100%+ of Title 24) for the entire project (Title 24, Part 6 of the California Code of Regulations; Energy Efficiency Standards for Residential and Non Residential Buildings, as amended January 24, 2013; Cool Roof Coatings performance standards as amended January 24, 2013):*
- *Incorporate dual paned or other energy efficient windows,*
  - *Incorporate energy efficient space heating and cooling equipment,*
  - *Incorporate energy efficient light fixtures, photocells, and motion detectors,*
  - *Incorporate energy efficient appliances,*
  - *Incorporate energy efficient domestic hot water systems,*
  - *Incorporate solar panels into the electrical system,*
  - *Incorporate cool roofs/light colored roofing,*
  - *Incorporate other measures that will increase energy efficiency.*
  - *Increase insulation to reduce heat transfer and thermal bridging.*
  - *Limit air leakage throughout the structure and within the heating and cooling distribution system to minimize energy consumption.*
- b) Plumbing. *All plumbing shall incorporate the following:*
- *All showerheads, lavatory faucets, and sink faucets shall comply with the California Energy Conservation flow rate standards.*
  - *Low flush toilets shall be installed where applicable as specified in California State Health and Safety Code Section 17921.3.*
  - *All hot water piping and storage tanks shall be insulated. Energy efficient boilers shall be used.*
- c) Lighting. *Lighting design for building interiors shall support the use of:*

- *Compact fluorescent light bulbs or equivalently efficient lighting.*
  - *Natural day lighting through site orientation and the use of reflected light.*
  - *Skylight/roof window systems.*
  - *Light colored building materials and finishes shall be used to reflect natural and artificial light with greater efficiency and less glare.*
  - *A multi-zone programmable dimming system shall be used to control lighting to maximize the energy efficiency of lighting requirements at various times of the day.*
  - *Provide a minimum of 2.5 percent of the project's electricity needs by on-site solar panels.*
- d) *Building Design.* *Building design and construction shall incorporate the following elements:*
- *Orient building locations to best utilize natural cooling/heating with respect to the sun and prevailing winds/natural convection to take advantage of shade, day lighting and natural cooling opportunities.*
  - *Utilize natural, low maintenance building materials that do not require finishes and regular maintenance.*
  - *Roofing materials shall have a solar reflectance index of 78 or greater.*
  - *All supply duct work shall be sealed and leak-tested. Oval or round ducts shall be used for at least 75 percent of the supply duct work, excluding risers.*
  - *Energy Star or equivalent appliances shall be installed.*
  - *A building automation system including outdoor temperature/humidity sensors will control public area heating, vent, and air conditioning units*
- e) *Landscaping.* *The developer shall submit for review and obtain approval from County Planning of landscape and irrigation plans that are designed to include drought tolerant and smog tolerant trees, shrubs, and groundcover to ensure the long-term viability and to conserve water and energy. The landscape plans shall include shade trees around main buildings, particularly along southern and western elevations, where practical.*
- f) *Irrigation.* *The developer shall submit irrigation plans that are designed, so that all common area irrigation areas shall be capable of being operated by a computerized irrigation system, which includes either an on-site weather station, ET gauge or ET-based controller capable of reading current weather data and making automatic adjustments to independent run times for each irrigation valve based on changes in temperature, solar radiation, relative humidity, rain and wind. In addition, the*

*computerized irrigation system shall be equipped with flow sensing capabilities, thus automatically shutting down the irrigation system in the event of a mainline break or broken head. These features will assist in conserving water, eliminating the potential of slope failure due to mainline breaks and eliminating over-watering and flooding due to pipe and/or head breaks.*

- g) Recycling. Exterior storage areas for recyclables and green waste shall be provided. Where recycling pickup is available, adequate recycling containers shall be located in public areas. Construction and operation waste shall be collected for reuse and recycling.*
- h) Transportation Demand Management (TDM) Program. The project shall include adequate bicycle parking near building entrances to promote cyclist safety, security, and convenience. Preferred carpool/vanpool spaces shall be provided and, if available, mass transit facilities shall be provided (e.g. bus stop bench/shelter). The developer shall demonstrate that the TDM program has been instituted for the project or that the buildings will join an existing program located within a quarter mile radius from the project site that provides a cumulative 20% reduction in unmitigated employee commute trips. The TDM Program shall publish ride-sharing information for ride-sharing vehicles and provide a website or message board for coordinating rides. The Program shall ensure that appropriate bus route information is placed in each building.*

- 4. GHG – Installation/Implementation Standards. The developer shall submit for review and obtain approval from County Planning of evidence that all applicable GHG performance standards have been installed, implemented properly and that specified performance objectives are being met to the satisfaction of County Planning and County Building and Safety. These installations/ procedures include the following:*
  - a) Design features and/or equipment that cumulatively increases the overall compliance of the project to exceed Title 24 minimum standards by five percent.*
  - b) All interior building lighting shall support the use of fluorescent light bulbs or equivalent energy-efficient lighting.*
  - c) Installation of both the identified mandatory and optional design features or equipment that have been constructed and incorporated into the facility/structure.*

**RESIDENTIAL PROJECTS**

1. GHG – Operational Standards. *The developer shall implement the following as greenhouse gas (GHG) mitigation during the operation of the approved project:*
  - a) Waste Stream Reduction. *The “developer” shall provide to all tenants and project employees County-approved informational materials about methods and need to reduce the solid waste stream and listing available recycling services.*
  - b) Vehicle Trip Reduction. *The “developer” shall provide to all tenants and homeowners County-approved informational materials about the need to reduce vehicle trips and the program elements this project is implementing. Such elements may include: participation in established ride-sharing programs, creating a new ride-share employee vanpool, and/or providing a web site or message board for coordinating rides.*
  - c) Provide Educational Materials. *The developer shall provide to all tenants and employees education materials and about reducing waste and available recycling services. The education materials shall be submitted to County Planning for review and approval.*
  - d) Landscape Equipment. *The developer shall require in the landscape maintenance contract and/or in onsite procedures that a minimum of 20% of the landscape maintenance equipment shall be electric-powered.*
  
2. GHG – Construction Standards. *The developer shall submit for review and obtain approval from County Planning of a signed letter agreeing to include as a condition of all construction contracts/subcontracts requirements to reduce impacts to GHG and submitting documentation of compliance. The developer/construction contractors shall do the following:*
  - a) *Implement both the approved Coating Restriction Plans.*
  - b) *Select construction equipment based on low-emissions factors and high-energy efficiency. All diesel/gasoline-powered construction equipment shall be replaced, where possible, with equivalent electric or CNG equipment.*
  - c) *Grading plans shall include the following statements:*
    - *“All construction equipment engines shall be properly tuned and maintained in accordance with the manufacturers specifications prior to arriving on site and throughout construction duration.”*
    - *“All construction equipment (including electric generators) shall be shut off by work crews when not in use and shall not idle for more than 5 minutes.”*

- d) *Schedule construction traffic ingress/egress to not interfere with peak-hour traffic and to minimize traffic obstructions. Queuing of trucks on and off site shall be firmly discouraged and not scheduled. A flagperson shall be retained to maintain efficient traffic flow and safety adjacent to existing roadways.*
  - e) *Recycle and reuse construction and demolition waste (e.g. soil, vegetation, concrete, lumber, metal, and cardboard) per County Solid Waste procedures.*
  - f) *The construction contractor shall support and encourage ridesharing and transit incentives for the construction crew and educate all construction workers about the required waste reduction and the availability of recycling services.*
3. *GHG – Design Standards.* *The developer shall submit for review and obtain approval from County Planning that the following measures have been incorporated into the design of the project. These are to reduce potential project impacts on green house gases (GHGs): Proper installation of the approved design features and equipment shall be confirmed by County Building and Safety prior to final inspection of each structure.*
- a) *Meet Title 24 Energy Efficiency requirements implemented July 1, 2014* *The Developer shall document that the design of the proposed structures meets the current Title 24 energy-efficiency requirements. County Planning shall coordinate this review with the County Building and Safety. Any combination of the following design features may be used to fulfill this requirement, provided that the total increase in efficiency meets or exceeds the cumulative goal (100%+ of Title 24) for the entire project (Title 24, Part 6 of the California Code of Regulations; Energy Efficiency Standards for Residential and Non Residential Buildings, as amended January 24, 2013; Cool Roof Coatings performance standards as amended January 24, 2013):*
    - *Incorporate dual paned or other energy efficient windows,*
    - *Incorporate energy efficient space heating and cooling equipment,*
    - *Incorporate energy efficient light fixtures, photocells, and motion detectors,*
    - *Incorporate energy efficient appliances,*
    - *Incorporate energy efficient domestic hot water systems,*
    - *Incorporate solar panels into the electrical system,*
    - *Incorporate cool roofs/light colored roofing,*
    - *Incorporate other measures that will increase energy efficiency.*
    - *Increase insulation to reduce heat transfer and thermal bridging.*

- *Limit air leakage throughout the structure and within the heating and cooling distribution system to minimize energy consumption.*
- b) Plumbing. *All plumbing shall incorporate the following:*
- *All showerheads, lavatory faucets, and sink faucets shall comply with the California Energy Conservation flow rate standards.*
  - *Low flush toilets shall be installed where applicable as specified in California State Health and Safety Code Section 17921.3.*
  - *All hot water piping and storage tanks shall be insulated. Energy efficient boilers shall be used.*
  - *If possible, utilize grey water systems and dual plumbing for recycled water.*
- c) Lighting. *Lighting design for building interiors shall support the use of:*
- *Compact fluorescent light bulbs or equivalently efficient lighting.*
  - *Natural day lighting through site orientation and the use of reflected light.*
  - *Skylight/roof window systems.*
  - *Light colored building materials and finishes shall be used to reflect natural and artificial light with greater efficiency and less glare.*
  - *A multi-zone programmable dimming system shall be used to control lighting to maximize the energy efficiency of lighting requirements at various times of the day.*
  - *The developer shall ensure that a minimum of 2.5 percent of the project's electricity needs is provided by on-site solar panels.*
- d) Building Design. *Building design and construction shall incorporate the following elements:*
- *Orient building locations to best utilize natural cooling/heating with respect to the sun and prevailing winds/natural convection to take advantage of shade, day lighting and natural cooling opportunities.*
  - *Utilize natural, low maintenance building materials that do not require finishes and regular maintenance..*
  - *Roofing materials shall have a solar reflectance index of 78 or greater.*
  - *All supply duct work shall be sealed and leak-tested. Oval or round ducts shall be used for at least 75 percent of the supply duct work, excluding risers.*
  - *Energy Star or equivalent equipment shall be installed.*
  - *A building automation system including outdoor temperature/humidity sensors will control public area heating, vent, and air conditioning units*

- e) Landscaping. *The developer shall submit for review and obtain approval from County Planning of landscape and irrigation plans that are designed to include drought tolerant and smog tolerant trees, shrubs, and groundcover to ensure the long-term viability and to conserve water and energy. The landscape plans shall include shade trees around main buildings, particularly along southern and western elevations, where practical.*
- f) Irrigation. *The developer shall submit irrigation plans that are designed, so that all common area irrigation areas shall be capable of being operated by a computerized irrigation system, which includes either an on-site weather station, ET gauge or ET-based controller capable of reading current weather data and making automatic adjustments to independent run times for each irrigation valve based on changes in temperature, solar radiation, relative humidity, rain and wind. In addition, the computerized irrigation system shall be equipped with flow sensing capabilities, thus automatically shutting down the irrigation system in the event of a mainline break or broken head. These features will assist in conserving water, eliminating the potential of slope failure due to mainline breaks and eliminating over-watering and flooding due to pipe and/or head breaks.*
- g) Recycling. *Exterior storage areas for recyclables and green waste shall be provided. Adequate recycling containers shall be located in public areas. Construction and operation waste shall be collected for reuse and recycling.*
- h) Transportation Demand Management (TDM) Program. *The project shall include adequate bicycle parking near building entrances to promote cyclist safety, security, and convenience. If available, mass transit facilities shall be provided (e.g. bus stop bench/shelter). The developer shall publish ride-sharing information for ride-sharing vehicles and provide a website or message board for coordinating rides. The Program shall ensure that appropriate bus route information is available to tenants and homeowners.*
4. GHG – Installation/Implementation Standards. *The developer shall submit for review and obtain approval from County Planning of evidence that all applicable GHG performance standards have been installed, implemented properly and that specified performance objectives are being met to the satisfaction of County Planning and County Building and Safety. These installations/ procedures include the following:*
- a) *Design features and/or equipment that cumulatively increases the overall compliance of the project to exceed Title 24 minimum standards by five percent.*

- b) *All interior building lighting shall support the use of fluorescent light bulbs or equivalent energy-efficient lighting.*
- c) *Installation of both the identified mandatory and optional design features or equipment that have been constructed and incorporated into the facility/structure.*

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## 3,000 MTCO<sub>2</sub>e Emission Level

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The County determined the size of development that is too small to be able to provide the level of GHG emission reductions expected from the Screening Tables or alternate emission analysis method (described in Attachment D) based upon the 90<sup>th</sup> percentile capture rate concept. To do this the County determined the GHG emission amount allowed by a project such that 90 percent of the emissions on average from projects would exceed that level and be “captured” by the Screening Table or alternate emission analysis method.

In determining this level of emissions the County used the database of Projects kept by the Governor’s Office of Planning and Research (OPR). That database contained 798 Projects, 60 of which were extremely large General Plan Updates, Master Plans, or Specific Plan Projects. The 60 very large projects were removed from the database in order not to skew the emissions value, leaving a net of 738 Projects. In addition, 27 projects were found to be outliers that would skew the emission value to high, leaving 711 as the sample population to use in determining the 90<sup>th</sup> percentile capture rate. Note that while the OPR database is a statewide database and may not exactly reflect emissions within the County, this method was considered conservative because development projects within unincorporated San Bernardino County tend to have higher energy consumption rates and have longer commute distances than the statewide average. As such, using the statewide database may produce an emissions value for the 90<sup>th</sup> percentile capture rate that may capture more than 90 percent of emissions.

The analysis of the 738 Projects within the sample population combined commercial, residential, and mixed use projects. Also note that the sample of projects included warehousing and other industrial land uses but did not include industrial processes (i.e. oil refineries, heavy manufacturing, electric generating stations, mining operations, etc.). Emissions from each of these Projects were calculated by SCAQMD and provide a consistent method of emissions calculations across the sample population further reducing potential errors in the statistical analysis. In calculating the emissions from Projects within the sample population, construction period GHG emissions were amortized over 30-years (the average economic life of a development project). Direct GHG emissions were calculated using URBEMIS and indirect electricity/water use GHG emissions calculated separately and added to the URBEMIS output.

This analysis determined that the 90<sup>th</sup> percentile ranged from 2,983-3,143 MTCO<sub>2</sub>e per year. The **3,000 MTCO<sub>2</sub>e per year** value was chosen as the medial value within that range and is used in defining



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small projects that must include the Performance Standards as described in this Attachment B, but do not need to use the Screening Tables or alternative GHG mitigation analysis described in Attachment D. The database is summarized in the spreadsheet shown on the following pages.

Insert OPR Spreadsheet here

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## Large Residential Projects Located Outside a City Sphere of Influence

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Residential Projects outside of a City Sphere of Influence that exceed 250 residential units will be required to prepare a project-specific GHG emissions analysis that includes a robust assessment of emissions, appropriate mitigation measures, and the issues associated with land use intensification and VMT generation on a project and regional basis. The analysis must produce an assessment that allows for a determination of whether the specific project causes cumulatively considerable GHG impacts. Residential Projects outside of a City Sphere of Influence that exceed 250 residential units will not qualify for the tiering and streamlining benefits otherwise provided by this Plan as allowed by CEQA Guidelines Section 15183.5 due to the inability to adequately analyze and incorporate programmatic mitigation that comprehensively addresses the issues of GHG emissions for regionally significant residential projects beyond the 2020 analysis horizon. It is anticipated that upon completion of the Sustainable Communities Strategy (SCS) by Southern California Association of Governments (SCAG) and the Regional GHG Reduction Plan currently under preparation by the San Bernardino County Association of Governments (SANBAG), adequate methodology for quantification of regional VMT and more comprehensive mitigation will provide suitable planning tools that can be incorporated into this Plan through a future amendment. Both the SCS and the Regional GHG Reduction Plan are intended to satisfy the requirements of SB 375 and allow better forecasts of GHG emissions in future years, as well as providing a regional strategy for reducing GHG emissions. This provision provides a mechanism to ensure that these types of land use commitments outside of SOIs do not impede the expected emissions trajectory to mid-century and are not likely to conflict with the long term goal of GHG emissions reductions through 2050. This provision is an interim procedure that will be re-examined in a major Plan update and amendment anticipated to occur in 2015 following a new emissions inventory and incorporation of the SCS and Regional GHG reduction measures.

## **ATTACHMENT 2:**

- a. Screening Tables**
- b. Methodology for the Development and Application of the Screening Tables**

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## Screening Tables

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The purpose of the Screening Tables is to provide guidance in measuring the reduction of greenhouse gas emissions attributable to certain design and construction measures incorporated into development projects. The analysis, methodology is based upon the GHG Plan, which includes GHG emission inventories, a year 2020 emission reduction target, the goals and policies to reach the target, together with the Programmatic EIR prepared for the GHG Plan.

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## Instructions for Residential, Commercial, or Industrial Projects

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The Screening Table assigns points for each option incorporated into a project as mitigation or a project design feature (collectively referred to as “feature”). The point values correspond to the minimum emissions reduction expected from each feature. The menu of features allows maximum flexibility and options for how development projects can implement the GHG reduction measures. Projects that garner at least 100 points will be consistent with the reduction quantities anticipated in the County’s GHG Plan. As such, those projects that garner a total of 100 points or greater would not require quantification of project specific GHG emissions reductions. Consistent with CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.

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## Instructions for Mixed Use Projects

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Mixed use projects provide additional opportunities to reduce emissions by combining complimentary land uses in a manner that can reduce vehicle trips. Mixed use projects also have the potential to complement energy efficient infrastructure in a way that reduces emissions. For mixed use projects fill out both Screening Table 1 and Table 2, but proportion the points identical to the proportioning of the mix of uses. As an example, a mixed use project that is 50% commercial uses and 50% residential uses will show ½ point for each assigned point value in Table 1 and Table 2. Add the points from both tables. Mixed use projects that garner at least 100 points will be consistent with the reduction quantities in the County’s GHG Plan and are considered less than significant for GHG emissions.

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## Instructions for All Projects

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Those Projects that garner 100 points using the Screening Tables have provided the “fair share” contribution of reductions and are considered consistent with the GHG Plan.

Those Projects that do not garner 100 points using the screening tables will need to provide additional analysis to determine the significance of GHG emissions. The following tables provide a menu of performance standards/options related to GHG mitigation measures and design features that can be used to demonstrate consistency with the reduction measures and GHG reduction quantities in the GHG Plan.

**Table 1: Screening Table for Implementation of GHG Reduction Measures for Residential Development**

Feature	Description	Assigned Point Values	Project Points
<b>Reduction Measure R2E6: Residential Energy Efficiency</b>			
<b>Building Envelope</b>			
Insulation	2008 Baseline (walls R-13; roof/attic: R-30)	0 points	
	Modestly Enhanced Insulation (walls R-13; roof/attic: R-38)	12 points	
	Enhanced Insulation (rigid wall insulation R-13, roof/attic: R-38)	15 points	
	Greatly Enhanced Insulation (spray foam wall insulated walls R-15 or higher, roof/attic R-38 or higher)	18 points	
Windows	2008 Baseline Windows (0.57 U-factor, 0.4 solar heat gain coefficient (SHGC))	0 points	
	Modestly Enhanced Window Insulation (0.4 U-Factor, 0.32 SHGC)	6 points	
	Enhanced Window Insulation (0.32 U-Factor, 0.25 SHGC)	7 points	
	Greatly Enhanced Window Insulation (0.28 or less U-Factor, 0.22 or less SHGC)	9 points	
Cool Roof	Modest Cool Roof (CRRC Rated 0.15 aged solar reflectance, 0.75 thermal emittance)	10 points	
	Enhanced Cool Roof(CRRC Rated 0.2 aged solar reflectance, 0.75 thermal emittance)	12 points	
	Greatly Enhanced Cool Roof (CRRC Rated 0.35 aged solar reflectance, 0.75 thermal emittance)	14 points	
Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage.		
	Air barrier applied to exterior walls, calking, and visual inspection such as the HERS Verified Quality Insulation Installation (QII or equivalent)	10 points	
	Blower Door HERS Verified Envelope Leakage or equivalent	8 points	
Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls.		
	Modest Thermal Mass (10% of floor or 10% of walls: 12" or more thick exposed concrete or masonry. No permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	2 points	
	Enhanced Thermal Mass (20% of floor or 20% of walls: 12" or more thick exposed concrete or masonry. No permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	4 points	

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Feature	Description	Assigned Point Values	Project Points
<b>Indoor Space Efficiencies</b>			
Heating/ Cooling Distribution System	Minimum Duct Insulation (R-4.2 required)	0 points	
	Modest Duct insulation (R-6)	7 points	
	Enhanced Duct Insulation (R-8)	8 points	
	Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent)	12 points	
Space Heating/ Cooling Equipment	2008 Minimum HVAC Efficiency (SEER 13/60% AFUE or 7.7 HSPF)	0 points	
	Improved Efficiency HVAC (SEER 14/65% AFUE or 8 HSPF)	4 points	
	High Efficiency HVAC (SEER 15/72% AFUE or 8.5 HSPF)	7 points	
	Very High Efficiency HVAC (SEER 16/80% AFUE or 9 HSPF)	9 points	
Water Heaters	2008 Minimum Efficiency (0.57 Energy Factor)	0 points	
	Improved Efficiency Water Heater (0.675 Energy Factor)	12 points	
	High Efficiency Water Heater (0.72 Energy Factor)	15 points	
	Very High Efficiency Water Heater ( 0.92 Energy Factor)	18 points	
	Solar Pre-heat System (0.2 Net Solar Fraction)	4 points	
	Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	8 points	
Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		
	All peripheral rooms within the living space have at least one window (required)	0 points	
	All rooms within the living space have daylight (through use of windows, solar tubes, skylights, etc.)	1 points	
	All rooms daylighted	2 points	
Artificial Lighting	2008 Minimum (required)	0 points	
	Efficient Lights (25% of in-unit fixtures considered high efficacy. High efficacy is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt)	8 points	
	High Efficiency Lights (50% of in-unit fixtures are high efficacy)	10 points	
	Very High Efficiency Lights (100% of in-unit fixtures are high efficacy)	12 points	
Appliances	Energy Star Refrigerator (new)	1 points	
	Energy Star Dish Washer (new)	1 points	
	Energy Star Washing Machine (new)	1 points	



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Feature	Description	Assigned Point Values	Project Points
<b>Miscellaneous Residential Building Efficiencies</b>			
Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes natural heating, cooling, and lighting.	5 point	
Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on Jun 21 <sup>st</sup> .	4 Points	
Energy Star Homes	EPA Energy Star for Homes (version 3 or above)	25 points	
Independent Energy Efficiency Calculations	Provide point values based upon energy efficiency modeling of the Project. Note that engineering data will be required documenting the energy efficiency and point values based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Other	This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Existing Residential Retrofits	<p>The applicant may wish to provide energy efficiency retrofit projects to existing residential dwelling units to further the point value of their project. Retrofitting existing residential dwelling units within the City is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case by case basis and must have the approval of the City Planning Department. The decision to allow applicants to ability to participate in this program will be evaluated based upon, but not limited to the following;</p> <p>Will the energy efficiency retrofit project benefit low income or disadvantaged residents?</p> <p>Does the energy efficiency retrofit project fit within the overall assumptions in reduction measures associated with existing residential retrofits?</p> <p>Does the energy efficiency retrofit project provide co-benefits important to the City?</p> <p>Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.</p>	TBD	
<b>Reduction Measure R2E8: Residential Renewable Energy Generation</b>			
Photovoltaic	<p>Solar Photovoltaic panels installed on individual homes or in collective neighborhood arrangements such that the total power provided augments:</p> <p>Solar Ready Homes (sturdy roof and solar ready service panel)</p> <p>10 percent of the power needs of the project</p> <p>20 percent of the power needs of the project</p> <p>30 percent of the power needs of the project</p> <p>40 percent of the power needs of the project</p> <p>50 percent of the power needs of the project</p> <p>60 percent of the power needs of the project</p> <p>70 percent of the power needs of the project</p> <p>80 percent of the power needs of the project</p>	<p>2 points</p> <p>10 points</p> <p>15 points</p> <p>20 points</p> <p>28 points</p> <p>35 points</p> <p>38 points</p> <p>42 points</p> <p>46 points</p>	

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Feature	Description	Assigned Point Values	Project Points
	90 percent of the power needs of the project	52 points	
	100 percent of the power needs of the project	58 points	
Wind turbines	Some areas of the City lend themselves to wind turbine applications. Analysis of the area’s capability to support wind turbines should be evaluated prior to choosing this feature.  Individual wind turbines at homes or collective neighborhood arrangements of wind turbines such that the total power provided augments:  10 percent of the power needs of the project 20 percent of the power needs of the project 30 percent of the power needs of the project 40 percent of the power needs of the project 50 percent of the power needs of the project 60 percent of the power needs of the project 70 percent of the power needs of the project 80 percent of the power needs of the project 90 percent of the power needs of the project 100 percent of the power needs of the project	   10 points 15 points 20 points 28 points 35 points 38 points 42 points 46 points 52 points 58 points	
Off-site renewable energy project	The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing homes that will help implement renewable energy within the City. These off-site renewable energy retrofit project proposals will be determined on a case by case basis and must be accompanied by a detailed plan that documents the quantity of renewable energy the proposal will generate. Point values will be determined based upon the energy generated by the proposal.	TBD	
Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.	TBD	
<b>Reduction Measure R2WC1: Residential Water Conservation</b>			
<b>Irrigation and Landscaping</b>			
Water Efficient Landscaping	Limit conventional turf to < 50% of required landscape area	0 points	
	Limit conventional turf to < 25% of required landscape area	4 points	
	No conventional turf (warm season turf to < 50% of required landscape area and/or low water using plants are allowed)	6 points	
	Only California Native Plants that requires no irrigation or some supplemental irrigation	8 points	

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Feature	Description	Assigned Point Values	Project Points
Water Efficient irrigation systems	Low precipitation spray heads < .75"/hr or drip irrigation	2 point	
	Weather based irrigation control systems or moisture sensors (demonstrate 20% reduced water use)	3 points	
Recycled Water	Recycled connections (purple pipe) to irrigation system on site	6 points	
Water Reuse	Gray water Reuse System collects Gray water from clothes washers, showers and faucets for irrigation use,	12 points	
Storm water Reuse Systems	Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	
<b>Potable Water</b>			
Showers	Water Efficient Showerheads (2.0 gpm)	3 points	
Toilets	Water Efficient Toilets (1.5 gpm)	3 points	
Faucets	Water Efficient faucets (1.28 gpm)	3 points	
Dishwasher	Water Efficient Dishwasher (6 gallons per cycle or less)	1	
Washing Machine	Water Efficient Washing Machine (Water factor <5.5)	1	
WaterSense	EPA WaterSense Certification	12 points	
<b>Reduction Measure R2T6: Vehicle Trip Reduction Measures</b>			
Mixed Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon a Transportation Impact Analysis (TIA) demonstrating trip reductions and/or reductions in vehicle miles traveled. Suggested ranges:  Diversity of land uses complementing each other (2-28 points) Increased destination accessibility other than transit (1-18 points) Increased transit accessibility (1-25 points) Infill location that reduces vehicle trips or VMT beyond the measures described above (points TBD based on traffic data).	TBD	
Residential Near Local Retail (Residential only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled.  The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled (VMT)	TBD	
Other Trip	Other trip or VMT reduction measures not listed above with TIA and/or other	TBD	

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Feature	Description	Assigned Point Values	Project Points
Reduction Measures	traffic data supporting the trip and/or VMT for the project.		
<b>Reduction Measure PS T2: Bicycle Infrastructure</b>			
Bicycle Infrastructure	.Provide bicycle paths within project boundaries.	TBD	
	Provide bicycle path linkages between residential and other land uses.	2 points	
	Provide bicycle path linkages between residential and transit.	5 points	
<b>Reduction Measure R2T5: Renewable Fuel/Alt. Fuel Vehicles (Electric Vehicle Infrastructure)</b>			
Electric Vehicle Recharging	Provide circuit and capacity in garages of residential units for use by an electric vehicle. Charging stations are for on-road electric vehicles legally able to drive on all roadways including Interstate Highways and freeways.	1 point	
	Install electric vehicle charging stations in the garages of residential units	8 points	
<b>Reduction Measure R2W5: Construction and Demolition Debris Diversion Program</b>			
Recycling of Construction/ Demolition Debris	Recycle 2% of debris (required)	0 points	
	Recycle 5% of debris	1 point	
	Recycle 8 % of debris	2 points	
	Recycle 10% of debris	3 points	
	Recycle 12% of debris	4 points	
	Recycle 15% of debris	5 points	
	Recycle 20% of debris	6 points	
<b>Reduction Measure R2W6: 75 Percent Solid Waste Diversion Program</b>			
Recycling	County initiated recycling program diverting 75% of waste requires coordination in neighborhoods to realize this goal. The following recycling features will help the County fulfill this goal:		
<b>Total Points Earned by Residential Project:</b>			

**Table 2: Screening Table for Implementation of GHG Reduction Measures for Commercial Development**

Feature	Description	Assigned Point Values	Project Points
<b>Reduction Measure R2E7: Commercial/Industrial Energy Efficiency Development</b>			
<b>Building Envelope</b>			
Insulation	2008 baseline (walls R-13; roof/attic R-30)	0 points	
	Modestly Enhanced Insulation (walls R-13, roof/attic R-38))	15 points	
	Enhanced Insulation (rigid wall insulation R-13, roof/attic R-38)	18 points	
	Greatly Enhanced Insulation (spray foam insulated walls R-15 or higher, roof/attic R-38 or higher)	20 points	
Windows	2008 Baseline Windows (0.57 U-factor, 0.4 solar heat gain coefficient [SHGC])	0 points	
	Modestly Enhanced Window Insulation (0.4 U-factor, 0.32 SHGC)	7 points	
	Enhanced Window Insulation (0.32 U-factor, 0.25 SHGC)	8 points	
	Greatly Enhanced Window Insulation (0.28 or less U-factor, 0.22 or less SHGC)	12 points	
Cool Roof	Modest Cool Roof (CRRC Rated 0.15 aged solar reflectance, 0.75 thermal emittance)	12 points	
	Enhanced Cool Roof (CRRC Rated 0.2 aged solar reflectance, 0.75 thermal emittance)	14 points	
	Greatly Enhanced Cool Roof ( CRRC Rated 0.35 aged solar reflectance, 0.75 thermal emittance)	16 points	
Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage.		
	Air barrier applied to exterior walls, caulking, and visual inspection such as the HERS Verified Quality Insulation Installation (QII or equivalent)	12 points	
	Blower Door HERS Verified Envelope Leakage or equivalent	10 points	
Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls.		
	Modest Thermal Mass (10% of floor or 10% of walls 12” or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	4 points	
	Enhanced Thermal Mass (20% of floor or 20% of walls 12” or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	6 points	

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Feature	Description	Assigned Point Values	Project Points
	Enhanced Thermal Mass (80% of floor or 80% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	24 points	
<b>Indoor Space Efficiencies</b>			
Heating/ Cooling Distribution System	Minimum Duct Insulation (R-4.2 required)	0 points	
	Modest Duct insulation (R-6)	8 points	
	Enhanced Duct Insulation (R-8)	10 points	
	Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent)	14 points	
Space Heating/ Cooling Equipment	2008 Minimum HVAC Efficiency (EER 13/60% AFUE or 7.7 HSPF)	0 points	
	Improved Efficiency HVAC (EER 14/65% AFUE or 8 HSPF)	7 points	
	High Efficiency HVAC (EER 15/72% AFUE or 8.5 HSPF)	8 points	
	Very High Efficiency HVAC (EER 16/80% AFUE or 9 HSPF)	12 points	
Commercial Heat Recovery Systems	Heat recovery strategies employed with commercial laundry, cooking equipment, and other commercial heat sources for reuse in HVAC air intake or other appropriate heat recovery technology. Point values for these types of systems will be determined based upon design and engineering data documenting the energy savings.	TBD	
Water Heaters	2008 Minimum Efficiency (0.57 Energy Factor)	0 points	
	Improved Efficiency Water Heater (0.675 Energy Factor)	14 points	
	High Efficiency Water Heater (0.72 Energy Factor)	16 points	
	Very High Efficiency Water Heater (0.92 Energy Factor)	19 points	
	Solar Pre-heat System (0.2 Net Solar Fraction)	4 points	
	Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	8 points	
Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		
	All peripheral rooms within building have at least one window or skylight	1 points	
	All rooms within building have daylight (through use of windows, solar tubes, skylights, etc.)	5 points	
	All rooms daylighted	7 points	
Artificial Lighting	2008 Minimum (required)	0 points	
	Efficient Lights (25% of in-unit fixtures considered high efficacy. High efficacy is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt)	9 points	

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Feature	Description	Assigned Point Values	Project Points
	High Efficiency Lights (50% of in-unit fixtures are high efficacy)	12 points	
	Very High Efficiency Lights (100% of in-unit fixtures are high efficacy)	14 points	
Appliances	Star Commercial Refrigerator (new)	4 points	
	Energy Star Commercial Dish Washer (new)	4 points	
	Energy Star Commercial Cloths Washing	4 points	
<b>Miscellaneous Commercial/Industrial Building Efficiencies</b>			
Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes conditions for natural heating, cooling, and lighting.	6 point	
Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on Jun 21st.	6 Points	
Other	This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Existing Commercial building Retrofits	<p>The applicant may wish to provide energy efficiency retrofit projects to existing commercial buildings to further the point value of their project. Retrofitting existing commercial buildings within the City is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case by case basis and must have the approval of the City Planning Department. The decision to allow applicants to ability to participate in this program will be evaluated based upon, but not limited to the following:</p> <p>Will the energy efficiency retrofit project benefit low income or disadvantaged communities?</p> <p>Does the energy efficiency retrofit project fit within the overall assumptions in the reduction measure associated with commercial building energy efficiency retrofits?</p> <p>Does the energy efficiency retrofit project provide co-benefits important to the City?</p> <p>Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.</p>	TBD	
<b>Reduction Measure R2E9 and R2E10: New Commercial/Industrial Renewable Energy</b>			
Photovoltaic	Solar Photovoltaic panels installed on commercial buildings or in collective		

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Feature	Description	Assigned Point Values	Project Points
	<p>arrangements within a commercial development such that the total power provided augments:</p> <p>Solar Ready Roofs (sturdy roof and electric hookups)</p> <p>10 percent of the power needs of the project</p> <p>20 percent of the power needs of the project</p> <p>30 percent of the power needs of the project</p> <p>40 percent of the power needs of the project</p> <p>50 percent of the power needs of the project</p> <p>60 percent of the power needs of the project</p> <p>70 percent of the power needs of the project</p> <p>80 percent of the power needs of the project</p> <p>90 percent of the power needs of the project</p> <p>100 percent of the power needs of the project</p>	<p>2 points</p> <p>8 points</p> <p>14 points</p> <p>20 points</p> <p>26 points</p> <p>32 points</p> <p>38 points</p> <p>44 points</p> <p>50 points</p> <p>56 points</p> <p>60 points</p>	
Wind turbines	<p>Some areas of the City lend themselves to wind turbine applications. Analysis of the areas capability to support wind turbines should be evaluated prior to choosing this feature.</p> <p>Wind turbines as part of the commercial development such that the total power provided augments:</p> <p>10 percent of the power needs of the project</p> <p>20 percent of the power needs of the project</p> <p>30 percent of the power needs of the project</p> <p>40 percent of the power needs of the project</p> <p>50 percent of the power needs of the project</p> <p>60 percent of the power needs of the project</p> <p>70 percent of the power needs of the project</p> <p>80 percent of the power needs of the project</p> <p>90 percent of the power needs of the project</p> <p>100 percent of the power needs of the project</p>	<p>8 points</p> <p>14 points</p> <p>20 points</p> <p>26 points</p> <p>32 points</p> <p>38 points</p> <p>44 points</p> <p>50 points</p> <p>56 points</p> <p>60 points</p>	
Off-site renewable energy project	<p>The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing commercial/industrial that will help implement reduction measures associated with existing buildings. These off-site renewable energy retrofit project proposals will be determined on a case by case basis accompanied by a detailed plan documenting the quantity of renewable energy the proposal will generate. Point values will be based upon the energy generated by the proposal.</p>	TBD	
Other Renewable Energy Generation	<p>The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon</p>	TBD	



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Feature	Description	Assigned Point Values	Project Points
	engineering data documenting the ability to generate electricity.		
<b>Reduction Measure R2E7: Warehouse Renewable Energy Incentive Program</b>			
Warehouse Photovoltaic	This measure is for warehouse projects and involves partnership with Sothern California Edison and California Public Utilities Commissions to develop an incentive program for solar installation on new and retrofit existing warehouses. A mandatory minimum solar requirement for new warehouse space. Solar Photovoltaic panels installed on warehouses or in collective arrangements within a logistics/warehouse complex such that the total power provided augments:		
	Solar Ready Roof (sturdy roof and electric hookups)	2 points	
	10 percent of the power needs of the project	4 points	
	20 percent of the power needs of the project	5 points	
	30 percent of the power needs of the project	7 points	
	40 percent of the power needs of the project	9 points	
	50 percent of the power needs of the project	11 points	
	60 percent of the power needs of the project	13 points	
	70 percent of the power needs of the project	15 points	
	80 percent of the power needs of the project	17 points	
	90 percent of the power needs of the project	19 points	
	100 percent of the power needs of the project	21 points	
<b>Reduction Measure R2WC1: R2WC-1: Per Capita Water Use Reduction Commercial/Industrial</b>			
<b>Irrigation and Landscaping</b>			
Water Efficient Landscaping	Eliminate conventional turf from landscaping	0 points	
	Only moderate water using plants	3 points	
	Only low water using plants	4 points	
	Only California Native landscape that requires no or only supplemental irrigation	8 points	
Trees	Increase tree planting in parking areas 50% beyond City Code requirements	TBD	
Water Efficient irrigation systems	Low precipitation spray heads< .75"/hr or drip irrigation	1 point	
	Weather based irrigation control systems combined with drip irrigation (demonstrate 20 reduced water use)	5 points	
Recycled Water	Recycled water connection (purple pipe)to irrigation system on site	5 points	
Storm water Reuse Systems	Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based	TBD	

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Feature	Description	Assigned Point Values	Project Points
	upon design and engineering data documenting the water savings.		
<b>Potable Water</b>			
Showers	Water Efficient Showerheads (2.0 gpm)	3 points	
Toilets	Water Efficient Toilets/Urinals (1.5gpm)	3 points	
	Waterless Urinals (note that commercial buildings having both waterless urinals and high efficiency toilets will have a combined point value of 6 points)	4 points	
Faucets	Water Efficient faucets (1.28gpm)	3 points	
Commercial Dishwashers	Water Efficient dishwashers (20% water savings)	4 points	
Commercial Laundry Washers	Water Efficient laundry (15% water savings)	3 points	
	High Efficiency laundry Equipment that captures and reuses rinse water (30% water savings)	6 points	
Commercial Water Operations Program	Establish an operational program to reduce water loss from pools, water features, etc., by covering pools, adjusting fountain operational hours, and using water treatment to reduce draw down and replacement of water. Point values for these types of plans will be determined based upon design and engineering data documenting the water savings.	TBD	
<b>Reduction Measure R2T2: Employment Based Trip and VMT Reduction Policy</b>			
Compressed Work Week	Reduce the number of days per week that employees need to be on site will reduce the number of vehicle trips associated with commercial/industrial development. Compressed work week such that full time employees are on site: days per week		
	5 days per week	0 points	
	4 days per week on site	4 points	
	3 days per week on site	8 points	
Car/Vanpools	Car/vanpool program	1 point	
	Car/vanpool program with preferred parking	2 points	
	Car/vanpool with guaranteed ride home program	3 points	
	Subsidized employee incentive car/vanpool program	5 points	
	Combination of all the above	6 points	
Employee Bicycle/ Pedestrian Programs	Complete sidewalk to residential within ½ mile	1 point	
	Complete bike path to residential within 3 miles	1 point	
	Bike lockers and secure racks	1 point	

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Feature	Description	Assigned Point Values	Project Points
	Showers and changing facilities	2 points	
	Subsidized employee walk/bike program	3 points	
	Note combine all applicable points for total value		
Shuttle/Transit Programs	Local transit within ¼ mile	1 point	
	Light rail transit within ½ mile	3 points	
	Shuttle service to light rail transit station	5 points	
	Guaranteed ride home program	1 points	
	Subsidized Transit passes	2 points	
	Note combine all applicable points for total value		
CRT	Employer based Commute Trip Reduction (CRT). CRTs apply to commercial, offices, or industrial projects that include a reduction of vehicle trip or VMT goal using a variety of employee commutes trip reduction methods. The point value will be determined based upon a TIA that demonstrates the trip/VMT reductions. Suggested point ranges:  Incentive based CRT Programs (1-8 points)  Mandatory CRT programs (5-20 points)	TBD	
Other Trip Reductions	Other trip or VMT reduction measures not listed above with TIA and/or other traffic data supporting the trip and/or VMT for the project.	TBD	
<b>Reduction Measure R2T4: Signal Synchronization and Intelligent Traffic Systems</b>			
Signal improvements	Signal synchronization-1 point per signal  Traffic signals connected to ITS	1 point/signal  3 points/signal	
<b>Reduction Measure R2T5: Renewable Fuel/Low Emissions Vehicles (EV Charging Stations)</b>			
Electric Vehicles	Provide public charging station for use by an electric vehicle (ten points for each charging station within the facility).	10 points	
<b>Reduction Measure R2T6: Vehicle Trip Reduction Measures</b>			
Mixed Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled	TBD	
Local Retail Near Residential (Commercial only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled.  The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions	TBD	

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Feature	Description	Assigned Point Values	Project Points
	and/or reductions in vehicle miles traveled		
<b>Reduction Measure R2W5: Construction and Demolition Debris Diversion Program</b>			
Recycling of Construction/ Demolition Debris	Recycle 2% of debris (required)	0 points	
	Recycle 5% of debris	1 point	
	Recycle 8 % of debris	2 points	
	Recycle 10% of debris	3 points	
	Recycle 12% of debris	4 points	
	Recycle 15% of debris	5 points	
	Recycle 20% of debris	6 points	
<b>Reduction Measure R2W6: 75 Percent Solid Waste Diversion Program</b>			
Recycling	County initiated recycling program diverting 75% of waste requires coordination with commercial development to realize this goal. The following recycling features will help the County fulfill this goal:		
	Provide separated recycling bins within each commercial building/floor and provide large external recycling collection bins at central location for collection truck pick-up	2 points	
	Provide commercial/industrial recycling programs that fulfills an on-site goal of 75% diversion of solid waste	5 points	
<b>Total Points from Commercial/Industrial Project:</b>			

## References

- Association of Environmental Professionals (AEP) White Paper: Alternative Approaches to Analyzing Greenhouse Gases and Global Climate Change Impacts in CEQA Documents, June 2007.
- Association of Environmental Professionals (AEP) White Paper: Community-wide Greenhouse Gas Emission Inventory Protocols, Mach 2011.
- Association of Environmental Professionals (AEP) White Paper: California Supplement to the United States Community-wide Greenhouse Gas Emission Inventory Protocols, Mach 2013.
- Bass, Ronald E., Herson, Albert I. and Bogdan, Kenneth M., CEQA Deskbook, April 1999
- California Air Pollution Control Officers Association (CAPCOA), White Paper: CEQA and Climate Change, January 2008
- California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures, August 2010
- California Air Resources Board, AB 32 Scoping Plan, December 2009
- California Climate Action Team's Final Report to the Governor and Legislature, March 2007
- California Climate Action Registry, General Reporting Protocol, Version 2.2, March 2007
- San Bernardino County, Draft Greenhouse Reduction Plan, March 2011
- South Coast Air Quality Management District, Rules and Regulations, 2010
- U.S. Environmental Protection Agency, AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, September 1995
- U.S. Environmental Protection Agency, AP-42, Final Rule on Update to the Compilation of Air Pollutant Emission Factors, October 2009

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## METHODS SUMMARY FOR SCREENING TABLES

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The point values in the Screening Tables were derived from the projected emissions reductions that each of the R2 reduction measures within the San Bernardino County GHG Reduction Plan (GHG Plan) would achieve. The GHG Plan shows the reduced emissions for each of the reduction measures in aggregate terms, meaning that the total emission reductions afforded each measure is based on both changes in existing land use activities as well as how new development is designed and built. In order to correctly allocate the emission reductions within the Screening Table, the amount of emission reductions afforded new development had to be segregated out of the aggregate total in a manner that is described below. Once the process of segregating new development out of the aggregate reduction totals was completed, the points were then proportion by residential unit or square feet of commercial/industrial uses. This was accomplished by taking the predicted growth in households and commercial/industrial uses by the year 2020 and assigned the appropriate proportion of the total R2 reduction quantities for new development to the residential, commercial, and industrial land use sectors within the Screening Table. The result is point values that are allocated by residential unit or commercial/industrial square footage (measured in 1000 sq.ft.). Because of this, the size of the project is not relevant to the Screening Table. Regardless of size, each project needs to achieve 100 points to demonstrate consistency with the GHG Plan. Efficiency, not size of the Project is critical. The following emission factor can be used in determining the amount of emissions reduced per point in the Screening Table:

The respective calculated emission values are in metric tons of carbon dioxide equivalents (MTCO<sub>2e</sub>)

For Residential Projects:

**0.092 MTCO<sub>2e</sub> per Point per Residential Unit**

For Commercial and Industrial Projects:

**0.691 MTCO<sub>2e</sub> per Point per 1,000 Square Feet of gross Commercial/Industrial building area**

Note that the Screening Table and point values are best used for typical development projects processed by the County. Examples of typical development projects include residential subdivisions, multi-family residential apartments, condominiums and townhouses, retail commercial, big box retail, office buildings, business parks, and typical warehousing. Mixed use projects can use the Screening Tables following the instructions. Transit oriented development (TOD), and infill projects are able to use the Screening Tables, but the Screening Table points are likely to underestimate total emission reductions afforded these types of projects. Note that the Screening Tables include the opportunity to custom develop points (using the factors above) in order to account for the predicted reductions in vehicle trips and vehicle miles traveled within a project specific traffic study and GHG analysis. TOD and infill projects can be more accurately assessed and allocated points using this method.

However, more unusual types of industrial projects such as cement manufacturing, metal foundries, refrigerant manufacturing, electric generating stations, and oil refineries cannot use the Screening Tables because the emission sources for those types of uses were not contemplated in the table.

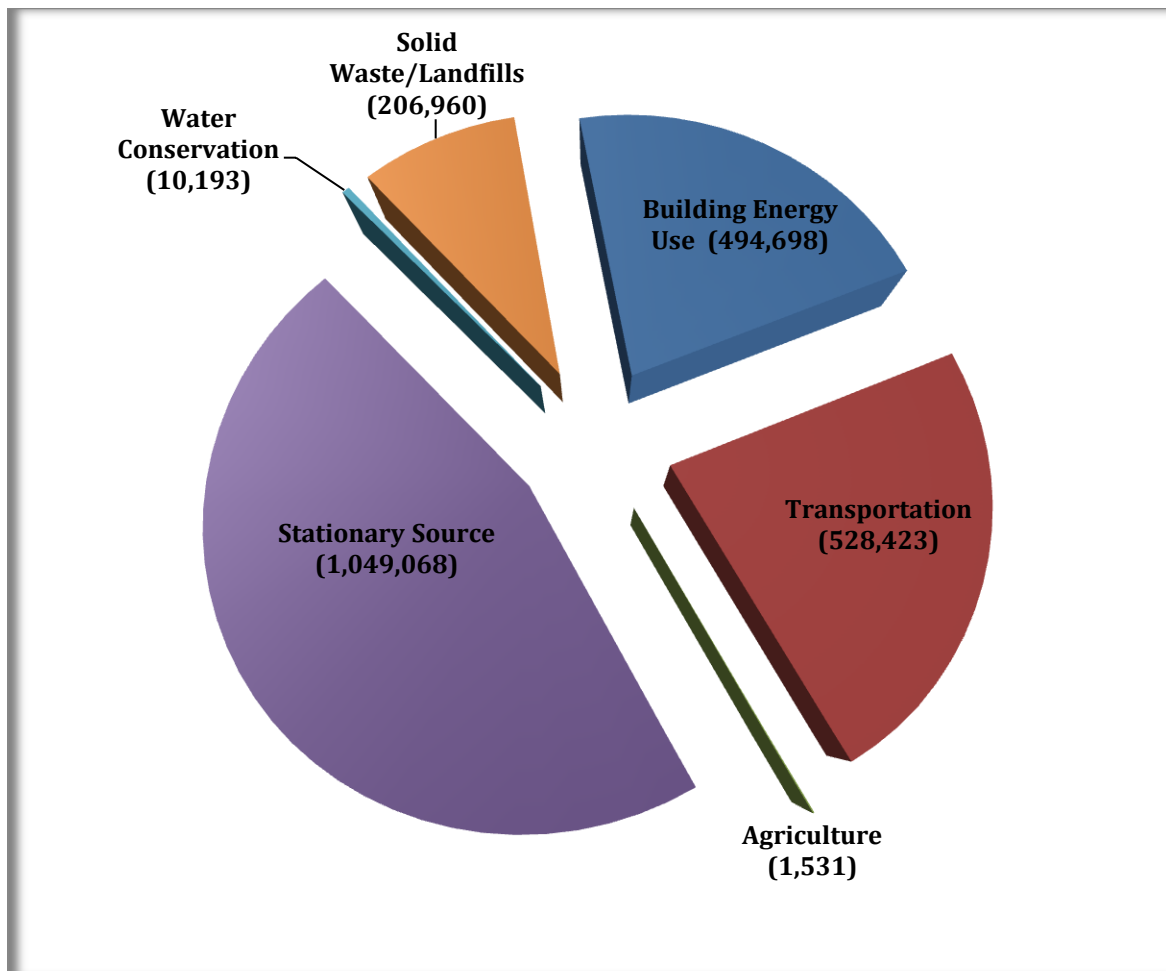
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## DEVELOPMENT OF THE POINT VALUES

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The first step in developing the point system was the need to determine the total reductions afforded the GHG Plan. Figure 1 below shows the total emission reductions achieved by the GHG Plan. In total 2,290,874MMTCO<sub>2</sub>e will be reduced as a result of the GHG Plan.

**Figure 1**



The next step in developing the point system is to segregate out the State efforts in reducing GHG emissions within the County. Table 1 shows the reductions allocated to State measures and County strategies.

**Table 1**

Sector	2020 Reduction (MTCO <sub>2</sub> e)		Total
	State Strategies	County Strategies	
Building Energy -Energy Efficiency and Alternative Energy	335,246	159,452	494,699
Transportation and Land Use	486,157	42,266	528,423
Solid Waste/Landfills	0	206,960	206,960
Stationary Source	1,049,068	0	1,049,068
Agriculture & Resource Conservation	1,531	0	1,531
Water Conservation	10,193	0	10,193
<b>Total</b>	<b>1,882,195</b>	<b>408,678</b>	<b>2,290,874</b>

As shown in Table 1, 408,678 MMTCO<sub>2</sub>e are reduced by the County's R2 measures. This amount includes reductions afforded existing building retrofits, other changes to activities associated with existing land uses, as well as reductions associated with new development.

The next step is to segregate out of the County strategies total the amount of emissions that will be reduced within new development.

Table 2 on the next page summarizes the reduction in emissions afforded new development from the R2 measures. Table 2 shows 159,423 MTCO<sub>2</sub>e being reduced from new development as a result of the County strategies (R2 measures in the GHG Plan). Within the 138,377 MTCO<sub>2</sub>e of new development reductions afforded County strategies, 117,385 MTCO<sub>2</sub>e of emissions reduced is accomplished through new Commercial and Industrial Projects, and 42,038 MTCO<sub>2</sub>e of emissions reduced is accomplished through new residential projects.

The County predicts that 5,083 new residential units will be needed by 2020 to accommodate the population growth by 2020 and 18,873 new jobs will be generated due to growth. A total of approximately 1,887,300 square feet of new commercial and industrial buildings within the unincorporated County area is needed to accommodate anticipated job growth. This estimate is based on the relationship between past growth in employment to the average growth in commercial/industrial building area for San Bernardino County.

Dividing the 42,038 MTCO<sub>2</sub>e reductions of emissions afforded the R2 measures for new residential development by the anticipated net of 4,575 new residential units that will be built yields 9.2 MTCO<sub>2</sub>e per residential unit that needs to be reduced to fulfill the anticipated reductions of the GHG Plan. That amount equals 100 points, producing the following equation for the point value:

**0.083 MTCO<sub>2</sub>e per Point per Residential Unit**

A similar process was used to derive the point value for new commercial/Industrial development dividing 117,384.9 MTCO<sub>2</sub>e reductions of emissions afforded the R2 measures for new commercial/industrial development by the anticipated net of 1,698,570 square feet of new commercial/industrial buildings that will be built yields 6.91 MTCO<sub>2</sub>e per 100 square feet of building. That amount equals 100 points, producing the following equation for the point value:



**0.0691 MTCO<sub>2</sub>e per Point per 100 Square Feet** of gross building area. Because commercial/industrial land uses are typically described in thousand square feet of building space, the point value was converted as follows: **0.691 MTCO<sub>2</sub>e per 1,000 Sq. Ft. of gross Commercial/Industrial building area.**

The final step was to allocate points to each of the reduction measures in order to provide the menu of point values. The spreadsheet on the next page shows emission reductions afforded each measure. Note that emissions associated with new development are reduced by the State’s R1 measures, as well as the County’s R2 measures. The Screening Tables focus on those measures the County is implementing associated with new development within the unincorporated County area. For this reason, the menu of options pertains to the portions of the R2 measures pertaining to new development.

**Table 2**

Reduction Number	Reduction Measure Name	Reduced Emissions(MTCO <sub>2</sub> e)	
		Commercial/Industrial	Residential
R2E4	Warehouse Renewable Energy	6,786.0	
R2E5	Solar Hot Water Systems		11,907.0
R2E6	Residential Energy Efficiency		9,460.0
R2E7	Commercial/Industrial Energy Efficiency	35,342.0	
R2E8	New Home Renewable Energy		2,239.0
R2E9	New Commercial/Industrial Renewable Energy	25,392.0	
R2E10	Comm/Ind. Rehab/Expansion Renewable Energy	21,086	
R2T1	Anti-Idling Enforcement Policy	2,415.2	
R2T2	Employer VMT Reduction	1,651.0	
R2T3	Parking Policies	824.0	
R2T4	Road Improvement/Signal Synchronization/TFM	8,230.0	
R2T5	Low and Zero Emission Vehicle Infrastructure	5,431.7	10,863.3
R2T6	Rideshare/Carpooling Programs	798.0	
R2T7	Bicycle/Pedestrian Infrastructure	532.0	266.0
R2T8	HOV Lanes	1,594.0	
R2W5	Construction Debris Diversion	147.5	147.5
R2W6	75 Percent Waste Diversion	2,059.0	2,059.0
R2WC1	Per Capita Water Reduction	5,096.5	5,096.5
<b>Total R2 Reductions for New Development</b>		<b>117,384.9</b>	<b>42,038.3</b>

## **ATTACHMENT 3:**

### **Determining Project Unmitigated and Mitigated GHG Emissions**

**SAN BERNARDINO COUNTY  
GREENHOUSE GAS DEVELOPMENT REVIEW PROCESS  
DETERMINING PROJECT UNMITIGATED AND MITIGATED GREENHOUSE GAS EMISSIONS**

San Bernardino County intends to use a Development Review Process to review individual projects for compliance with the San Bernardino County Greenhouse Gas Reduction Plan (Plan). Screening tables have been developed utilizing a 100-point scale that corresponds to approximately 138,227 metric tons of carbon dioxide equivalents per year (MTCO<sub>2</sub>e) of emissions reductions attributable to new development within the Plan. That level of emissions reductions is approximately 31 percent reduction of new development greenhouse gas (GHG) emissions (in the aggregate) compared to an unmitigated condition. The scale has been derived from calculations of the 2020 unmitigated emissions at the County level and the mitigative effects of different reduction strategies included in the Plan. Where projects utilize the screening table and qualify for 100 points, the project can be considered less than significant under CEQA and will not be required to quantify their individual project emission reductions. Where a project does not use the screening tables, the project is required to quantify its unmitigated emissions and provide a 31 percent reduction of those emissions in order to be considered less than significant. This memorandum describes a methodology to estimate project-level unmitigated and mitigated emissions.

The Plan includes a set of inventories as follows:

2007 Emissions = 6.25 MTCO<sub>2</sub>e

2020 Unmitigated Emissions = 7.59 MTCO<sub>2</sub>e (Results by applying predicted growth rates to the 2007 emissions in predicting 2020 unmitigated emissions)

Reduction Target = 5.31 MTCO<sub>2</sub>e [requires new development in the County to achieve a 31% reduction (in the aggregate) from the 2020 unmitigated emissions scenario to reduce total emissions in the County down to this level]

The Plan includes a forecast of 2020 unmitigated emissions from a benchmark of 2007 emissions. No emission reductions from future regulations or standards were afforded the 2020 unmitigated emission forecast. This means that the unmitigated emissions shown for 2020 are forecast using the predicted growth in each of the sectors but have an average GHG efficiency equivalent to that of buildings, transportation, and other emission sectors as they were in 2007. As such, 2007 constitutes the benchmark for all projects under evaluation through the development review process. Thus, calculation of unmitigated project GHG emissions is a calculation of what the project's GHG emissions would be under average efficiency assumptions for 2007. Project proponents then must calculate their estimate of current GHG emissions including any applicant-proposed reduction measures to determine whether or not the project will or won't provide 31 percent or more reductions.

Methods are described below for the building energy, transportation, waste, water conveyance emissions. Other source categories will require custom calculations. Due to the complexity of some of

the calculations for unmitigated and mitigated emissions, the need for accuracy, and the challenge of avoiding double-counting, it is recommended that emissions estimates only be prepared by qualified air quality experts. All estimates should provide full documentation of all assumptions and methods utilized. The County will review all provided estimates for adequacy and will only accept sufficiently detailed and supported estimates prepared by qualified individuals.

**PROJECT GHG EMISSION SOURCES**

Total GHG emissions are the sum of emissions from both direct and indirect sources. Direct sources include mobile sources such as offroad equipment, motor vehicles, landscape equipment; and stationary sources such as cooling and heating equipment. Indirect sources are comprised of electrical generation, and energy use in supplying potable water, as well as the disposal of solid waste, and the treatment of waste water.

Direct GHG emissions from mobile and stationary sources are determined as the sum of the annual GHG emissions from offroad equipment, motor vehicles, landscape equipment, and heating and cooling equipment.

Indirect sources are determined based on source as follows. Electrical usage is reported as annual emissions from electrical usage. Potable water usage is reported as the annual emissions from electricity used for potable water treatment and transportation. Solid waste is reported as the sum of annual emissions from solid waste disposal treatment, transportation, and fugitive emissions of methane at the solid waste facilities. Wastewater usage is reported as the annual emissions from wastewater transport and treatment.

**BUILDING ENERGY**

Building energy emissions associated with electricity and natural gas assumption are estimated by determining the amount of electricity (in kilowatt-hours) and natural gas consumption (in therms) and then multiplying by the GHG factors corresponding to electricity generation (per kwh) and natural gas combustion (per therm).

Project proponents can utilize the Residential Energy Consumption Survey (RECS) prepared by the U.S. Energy Information Administration (EIA) to determine the approximate average kwh per residential unit for residential projects of similar character as the proposed project. At present, the closest set of data to 2007 is the 2005 version of the RECS.

Project proponents can utilize the Commercial Buildings Energy Consumption Survey (CBECS) prepared by EIA to determine the approximate average therms per residential unit for commercial buildings of similar character as the proposed project. A 2007 version of CBECS should be available in 2011.

Where buildings are not comparable to a RECS or CBECS category, then project proponents must derive a separate rationale for 2007 average building energy consumption by obtaining data on at least three comparable “average” buildings in San Bernardino County by which to derive appropriate factors.

Once the baseline electricity and natural gas consumption have been identified, then they should be multiplied by the GHG intensity factors in Table 1.

RECS is available on the internet here: <http://www.eia.doe.gov/emeu/recs/>

CBCECS is available on the internet here: <http://www.eia.doe.gov/emeu/cbecs/>

## TRANSPORTATION

Project proponents can estimate their unmitigated onroad transportation emissions level by utilizing the current land use emissions model recommended by SCAQMD and using the 2007 model year. The current SCAQMD recommended model is the California Emissions Estimator model (CalEEMod) and is available free of charge and a user manual describes how to utilize the model.

CalEEMod can also be used to calculate operational GHG emissions (carbon dioxide, CO<sub>2</sub>; methane, CH<sub>4</sub>; and nitrous oxide N<sub>2</sub>O). CalEEMod uses default trip generation factors, but these factors can be adjusted to reflect site-specific details. Also, CalEEMod uses default trip lengths that may or may not be appropriate in order to capture the full length of project-related trips. Important steps for running CalEEMod are as follows:

1. Without a traffic study prepared for the project,
  - a. Provide the density of the project in CalEEMod (residential units per acre and/or square feet of commercial building per acre), and
  - b. The user should consult with the local air district for direction on which default options should be used in the modeling exercise. Some air districts have recommendations in the CEQA guidelines.
2. If a traffic study was prepared specifically for the project, the following information must be provided:
  - a. Total number of average daily vehicle trips or trip-generation rates by land use type per number of units; and,
  - b. Average VMT per residential and nonresidential trip.
  - c. The user overwrites the "Trip Rate (per day)" fields for each land use in CALEEMOD such that the resultant "Total Trips" and the "Total VMT" match the number of total trips and total VMT contained in the traffic study.
  - d. Overwrite "Trip Length" fields for residential and nonresidential trips in UBEMIS with the project-specific lengths obtained from the traffic study.
3. Calculate results and obtain the GHG emissions from the CalEEMod output file.

Offroad emissions can be estimated by identifying the types of equipment and operational timeframes. CARB's EMFAC model can provide carbon dioxide emission factors for a wide variety of equipment.

Alternatively, if fuel consumption totals can be estimated, then they can be multiplied by the GHG factors in Table 1 below.

CalEEMod is available on the internet here: <http://www.caleemod.com/>

EMFAC is available on the internet here: [http://www.arb.ca.gov/msei/onroad/latest\\_version.htm](http://www.arb.ca.gov/msei/onroad/latest_version.htm)

**WASTE**

Project proponents needs to estimate their level of annual waste generation using factors from the CIWMB reporting for San Bernardino County in 2007:

- Per capita disposal rate = 6.2 pounds/day = 1.03 metric tons/year per resident
- Per capita disposal rate = 38 pounds/day = 6.29 metric tons/year per employee

CIWMB reports are available on the internet here:

<http://www.calrecycle.ca.gov/LGCentral/Tools/MARS/DRMCMMain.asp>

Once the unmitigated annual level of waste generation have been identified, then it should be multiplied by the GHG intensity factor utilized in the Plan as follows:

- *2007 average GHG emissions per metric ton of waste (2007) = 0.005526 metric tons*

**WATER**

Project proponents need to estimate the annual amount of water consumption on an annual basis for the proposed project on a 2007 average basis:

Once the unmitigated level of annual water consumption has been identified, then it should be multiplied by the GHG intensity factors utilized in the Plan as follows:

- *2007 average GHG emissions per acre-feet of water = 0.49 metric tons/*

**WASTEWATER**

Project proponents need to estimate the annual amount of wastewater generation on an annual basis for the proposed project on a 2007 average basis.

Once the unmitigated level of annual wastewater generation has been identified, then it should be multiplied by the GHG intensity factors utilized in the Plan as follows:

- *2007 average GHG emissions for wastewater = 0.096 metric tons per resident*

**POINT SOURCES AND OTHER SOURCES**

If the project includes point sources of GHGs, such as industrial consumption of fuels other than natural gas, cement manufacture, or other sources, then custom calculations will have to be made in order to determine the 2007 unmitigated level.

**ESTIMATING PROJECT MITIGATED EMISSIONS**

Once the unmitigated 2007 emissions for the project have been calculated, then the mitigated project emissions can be calculated. Mitigated project emissions can and should take into account the following:

***The current level of GHG efficiency.*** Since the benchmark year is 2007, the current level of GHG efficiency may be improved since 2007. Where a source sector is not covered by adopted state and local measures (see discussion below), analysis of development projects should use the emission factors found in the latest version of the California Climate Action Registry (CCAR) General Reporting Protocol. Quantification of emissions from electricity used for potable water treatment and transportation as well

as wastewater transport and treatment can be found in the California Energy Commission (CEC) document titled “Refining Estimates of Water-Related Energy Use in California (CEC December 2006).

***The effect of adopted state and local measures by 2020.*** The state has adopted numerous measures to reduce GHG emissions, including vehicle standards, a low carbon fuel standard, a renewable energy standard, and other measures. The state mandates listed in Table 2 can be included in the County-required 31 percent reduction if they specifically relate to the proposed project. Table 3 provides an example of which measures would apply to a standard residential project. All of the calculations in Table 2 are reduction percentages compared to a 2007 benchmark efficiency. Thus, if a project takes credit for an adopted state or local measure, then it should not take additional credit for the difference between current year GHG efficiency and 2007 because the credit in Table 2 already accounts for potential improvements from 2007 to 2020.

***The effect of proponent-proposed measures.*** The adopted state and local measures will not be sufficient in and of themselves to reduce project level unmitigated emissions by 31%. Thus, project proponents, who do not use the screening tables, will be required to propose and quantify their individual reduction measures. Measures may include energy efficiency, renewable energy, VMT reductions, water conservation strategies that result in emissions more than the unmitigated levels. Proponents should calculate the effectiveness of proposed strategies such that the total of the adopted state and local measures above and the applicant-proposed measures totals a minimum of 31% of the unmitigated emissions. When determining the GHG reduction effectiveness, one may only count reductions that are in excess of the adopted state and local measures noted above. For example, for energy efficiency, all projects will be required to meet Title 24 efficiency standards that are in effect at the time of the project. Thus, additional credit can only be taken if the project’s energy efficiency exceeds Title 24 requirements. Similarly, waste diversion strategies can only provide additional credit if the project will result in greater than 75 percent diversion by 2020 of site generated waste. Finally, caution must be exercised in avoiding double-counting of emissions between adopted state and local measures, improvements in average GHG efficiency between the current year and 2007, and proponent-proposed measures. For this reason, it is recommended that GHG emission estimates only be prepared by qualified air quality experts.

**Table 1: Emission Factors to Use for Estimating Unmitigated Emissions**

Fuel	Emission Factor	Source
Compressed Natural Gas (CNG) (Vehicle)	0.054 Kg CO <sub>2</sub> /Standard Ft <sup>3</sup>	USEPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006 (2008)
Motor Gasoline (Vehicle)	8.81 Kg CO <sub>2</sub> /US gal	Provided in the California Local Government Operations Protocol (CARB et al. 2008)
Propane (Vehicle)	5.74 Kg CO <sub>2</sub> /US gal	
Diesel (Vehicle)	10.15 Kg CO <sub>2</sub> /US gal	
Natural Gas	0.0546 Kg CO <sub>2</sub> /Standard Ft <sup>3</sup> 0.1 g NO <sub>2</sub> /MMBTU 5 g CH <sub>4</sub> /MMBTU	
Other Fuels	Variable <sup>1</sup>	SQAQMD
Electricity	290.87 kg CO <sub>2</sub> /MWh 2.04 kg NO <sub>2</sub> /GWh 13.88 kg CH <sub>4</sub> /GWh	CCAR (2009a) Public Reports and USEPA eGrid2007 (2005 data)

Notes:

<sup>1</sup> Other fuels were included in the SCAQMD inventory. Associated emissions are based on emission factors from CARB's Regulation for the Mandatory Reporting of GHG Emissions and fuel High Heating Values (HHVs) from USEPA's AP-42 document.



<b>Table 2: San Bernardino County Greenhouse Gas Development Review Process State and Local Measures that can be included in Project Level reduction Requirement</b>			
<b>Reduction Measure Number</b>	<b>Sector</b>	<b>Description</b>	<b>Sectoral percent reduction</b>
R1E1B	Building Energy	RPS-33% by 2020	7.0%
R1E2	Building Energy	AB 1109 Residential Lighting	1.6%
R1E3	Building Energy	AB 1109 Commercial Lighting	1.0%
R1E4	Building Energy	Electricity Energy Efficiency (Title 24)	7.2%
R1E5	Building Energy	Natural Gas Energy Efficiency (Title 24)	0.6%
<b>Building Energy</b>		<b>Subtotal</b>	<b>17.4%</b>
R1T1	Transportation	Pavely I Standards	8.4%
R1T2	Transportation	Pavely II Standards	1.2%
R1T3	Transportation	Low Carbon Fuel Standard	6.7%
R1T4	Transportation	Tire Pressure Program	0.2%
R1T5	Transportation	Low Rolling Resistance Tires	0.1%
R1T6	Transportation	Low Friction Engine Oils	0.8%
R1T7	Transportation	Cool Paint/Reflective	0.3%
R1T9	Transportation	Heavy-Duty Vehicle Efficiency	0.5%
R1T10	Transportation	Med-& Heavy Duty Hybrid.	0.3%
R1T11	Transportation	Rule 1192-Clean Buses	0.03%
R1T12	Transportation	Rule 1195-Clean School Buses	0.03%
<b>Transportation</b>		<b>Subtotal</b>	<b>18.6%</b>
R2W1	Waste	Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills	27.0%
R2W2	Waste	Barstow Methane Recovery	10.6%
R2W3	Waste	Landers Methane Recovery	2.4%
R2W6	Waste	County Diversion Programs — 75 Percent Goal	1.1%
<b>Waste</b>		<b>Subtotal</b>	<b>41.1%</b>
R1WC1	Water Conveyance	RPS-33% by 2020	15.2%
<b>Water Conveyance</b>		<b>Subtotal</b>	<b>15.2%</b>

Table 3: San Bernardino County Greenhouse Gas Development Review Process			
Example of which State and Local Measures can be includes for a standard residential project ( <i>highlighted in bold italics</i> )			
Reduction Measure Number	Sector	Description	Sectoral percent reduction
<i>R1E1B</i>	<i>Building Energy</i>	<i>RPS-33% by 2020</i>	<i>7.0%</i>
<i>R1E2</i>	<i>Building Energy</i>	<i>AB 1109 Residential Lighting</i>	<i>1.6%</i>
R1E3	Building Energy	AB 1109 Commercial Lighting	1.0%
<i>R1E4</i>	<i>Building Energy</i>	<i>Electricity Energy Efficiency (Title 24)</i>	<i>7.2%</i>
<i>R1E5</i>	<i>Building Energy</i>	<i>Natural Gas Energy Efficiency (Title 24)</i>	<i>0.6%</i>
<i>R1T1</i>	<i>Transportation</i>	<i>Pavely I Standards</i>	<i>8.4%</i>
<i>R1T2</i>	<i>Transportation</i>	<i>Pavely II Standards</i>	<i>1.2%</i>
<i>R1T3</i>	<i>Transportation</i>	<i>Low Carbon Fuel Standard</i>	<i>6.7%</i>
<i>R1T4</i>	<i>Transportation</i>	<i>Tire Pressure Program</i>	<i>0.2%</i>
<i>R1T5</i>	<i>Transportation</i>	<i>Low Rolling Resistance Tires</i>	<i>0.1%</i>
<i>R1T6</i>	<i>Transportation</i>	<i>Low Friction Engine Oils</i>	<i>0.8%</i>
<i>R1T7</i>	<i>Transportation</i>	<i>Cool Paint/Reflective</i>	<i>0.3%</i>
R1T9	Transportation	Heavy-Duty Vehicle Efficiency	0.5%
R1T10	Transportation	Med-& Heavy Duty Hybrid.	0.3%
R1T11	Transportation	Rule 1192-Clean Buses	0.03%
R1T12	Transportation	Rule 1195-Clean School Buses	0.03%
<i>R2W1</i>	<i>Waste</i>	<i>Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills</i>	<i>27.0%</i>
<i>R2W2</i>	<i>Waste</i>	<i>Barstow Methane Recovery</i>	<i>10.6%</i>
<i>R2W3</i>	<i>Waste</i>	<i>Landers Methane Recovery</i>	<i>2.4%</i>
<i>R2W6</i>	<i>Waste</i>	<i>County Diversion Programs — 75 Percent Goal</i>	<i>1.1%</i>
<i>R1WC1</i>	<i>Water Conveyance</i>	<i>RPS-33% by 2020</i>	<i>15.2%</i>

**RESOURCES**

California Climate Action Registry. General Reporting Protocol. Public Reports for Reporting Entities

<http://www.climateregistry.org>

California Energy Commission. Refining Estimates of Water-Related Energy use in California.

[http://www.energy.ca.gov/pier/project\\_reports/CEC-500-2006-118.html](http://www.energy.ca.gov/pier/project_reports/CEC-500-2006-118.html)

EMFAC. Factor model for onroad mobile emissions sources from the California Air Resources Board.

[http://www.arb.ca.gov/msei/onroad/latest\\_version.htm](http://www.arb.ca.gov/msei/onroad/latest_version.htm)

OFFROAD. Model for factors for offroad equipment from the California Air Resources Board.

<http://www.arb.ca.gov/msei/offroad/offroad.htm>

CalEEMod. Public domain software for calculation criteria pollutant and GHG emissions from land use projects.

<http://www.caleemod.com>

## **ATTACHMENT 4:**

### **GHG Emission Reduction Calculations for Accessory Renewable Energy Projects**

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## ACCESSORY RENEWABLE ENERGY PROJECTS

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The GHG Plan included a GHG Reduction Measure (R3E14) that accounted for small wind energy systems that the County was permitting. These small wind energy systems as well as small photovoltaic energy systems within unincorporated San Bernardino County required a permit by the County. These systems were typically 10 kilowatts (kW) in size and were not regulated by the California Energy Commission (CEC) and did not count toward the utilities renewable portfolio or the State's R1 measures for renewable energy. At the time that the GHG Plan was drafted (2009), the County did not have estimated generation within unincorporated County areas from these systems and could not estimate the GHG reductions from these types of systems. However, the County saw these renewable energy systems as a potential GHG reducing mechanism and wanted to continue permitting such systems and encourage growth in these systems. Therefore the GHP Plan listed the small wind energy systems as well as small photovoltaic energy systems permitting process as an R3 measure that could not include GHG emission reductions calculations.

Since that time, the County has reviewed permitting records and determined the number of these permits issued since 2007. The records indicate the following:

Year 2007: 27 permits issued

Year 2008: 24 permits issued

Year 2009: 25 permits issued

Year 2010: 37 permits issued (permit fees were due to go up July 1, 2010 accounting for the increase in permits being issued in this year)

Systems permitted prior to 2007 were considered within the baseline energy use for the External GHG Inventory and not counted in this analysis. In total, 113 10kW Wind Energy Systems were permitted between 2007 and 2010. Taking out year 2010, on average 25 to 26 permits are issued per year. Year 2010 was taken out of the average because of the spike in permits likely caused by the fee increase. In predicting the number of systems in place by 2020 using these records, approximately 250 permits would be issued between 2010 and 2020 plus the existing 113 units currently operating gives a combined total of 363 wind energy units. Each unit is estimated to account for 22.12 MTCO<sub>2e</sub> per year in GHG reductions. Total reductions expected from these wind energy systems in year 2020 is **8,030.89 MTCO<sub>2e</sub> per year**. The calculations of the wind turbine systems generation and GHG emission reductions are shown on the spreadsheet on the following page.

About half this many photovoltaic systems were also permitted by the County (average of 13 per year). A conservative analysis in the emission reductions from these systems estimates at least 127.41 MTCO<sub>2e</sub> per year assuming 130 systems in place by year 2020 and slightly less than one metric ton CO<sub>2e</sub> being

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reduced. These estimates are extremely conservative due to the lack of additional data on PV systems and the actual electric generating capacity and emissions reduction from PV is likely much higher.

Insert Energy spreadsheet here.