

Appendix A – Climate Action Plan’s Relationship to CEQA

A.1 Introduction

The California Environmental Quality Act (CEQA) is a California statute passed in 1970 to institute a statewide policy of environmental protection. Under CEQA, state and local government agencies are required to analyze the significant environmental impacts of discretionary actions, such as approval of a proposed development project, plan, policy, or code, and to identify feasible mitigation measures and alternatives that may avoid or reduce those impacts. Since the CEQA Guidelines were amended in 2010 to clarify that the effect of greenhouse gas (GHG) emissions on climate change is an environmental issue that requires analysis and reduction, agencies must evaluate whether their discretionary actions would result in a significant impact due to GHG emissions and climate change.

The following sections discuss the CEQA Guidelines for the Climate Action Plan and adoption of the Climate Action Plan under CEQA.

A.2 CEQA Guidelines

CEQA Guidelines for GHG emissions reduction plans, such as the Port’s Climate Action Plan, have been developed by the California Governor’s Office of Planning and Research (OPR) and adopted by the California Natural Resources Agency. CEQA Guidelines §15183.5 specifies that a plan for the reduction of GHG emissions should include or address specific elements. OPR is currently developing guidance for climate action planning and the use of plans for the reduction of GHG emissions in a CEQA analysis.¹ While this guidance is being developed, OPR refers to a presentation provided during its Local Government Roundtable (June 20, 2011) regarding climate action planning² and to other recent climate action planning guidance documents such as the Bay Area Air Quality Management District’s (BAAQMD’s) CEQA Air Quality Guidelines³.

The table below lists the elements to be included in a climate action plan pursuant to CEQA Guidelines §15183.5 and discusses how the Port has or will address each element.

¹ OPR. 2011. Climate Action Planning. Local Government Roundtable Questions and Answers. June 20. Available from: <http://opr.ca.gov/docs/capfaq.pdf>. Accessed July 23, 2012.

² OPR. 2011.

³ BAAQMD. 2011. CEQA Air Quality Guidelines. May. Available from: <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx?la=en>, Accessed February 28, 2012

CEQA Guideline Elements	Port's Climate Action Plan
1. Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic range.	The Port has prepared and documented GHG emissions inventories of Port-wide emissions sources for a 2006 baseline and future years including 2020 business as usual (BAU), 2020, 2035, and 2050. The Port's GHG inventory documentation is presented in Appendix B .
2. Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable.	In accordance with current OPR guidance and reflected in the BAAQMD guidance on climate action planning (BAAQMD 2011), the Climate Action Plan establishes a 2020 target that meets the State's goal for 2020 under AB32 and acknowledges the 2050 target from Executive Order S-3-05, as described in Appendix D .
3. Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area.	In the Port's future GHG inventories (Appendix B), the contribution of known proposed projects and all current land uses at the Port have been evaluated. In addition, the effects of State measures and anticipated local actions are incorporated.
4. Specify measures or a group of measures, including performance standards that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.	The Port has identified GHG reduction measures, which the Board may implement on an annual basis. The Port's specified reduction measures compiled before 2013 Board Workshops on the Climate Action Plan are discussed in Appendix C . The objectives of these original reduction measures to help achieve the Climate Action Plan targets are described in Appendix E . Measures received during the final review process of the Climate Action Plan may not be included in the analysis but any additional measures are assumed to increase reductions expected. The reduction measure implementation process, including the development of performance standards and the incorporation of the measures in future projects, is addressed in Appendix F and in Board Policy 750 , which reflects the Port's current implementation approach and methods to incorporate new reduction measures developed by the Port in the future.
5. Establish a mechanism to monitor the plan's progress toward achieving the specified emissions level and to require amendment if the plan is not achieving specified levels.	The Port's monitoring plan for tracking reduction measure performance and overall Climate Action Plan performance are presented in Appendix F and in Board Policy 750 . It includes a timeline for implementation as well as regular reporting

CEQA Guideline Elements	Port's Climate Action Plan
	and an amendment process of the Climate Action Plan.
6. Adopt the GHG reduction strategy in a public process following environmental review.	As discussed in Appendix G , the Port's Climate Action Plan has been developed with community involvement through a series of Board, work group, and public meetings in 2011 and 2012. In addition, the Port held three Board Workshops in 2013 to finalize the draft Climate Action Plan and implementation approach as reflected in Board Policy 750. Following environmental review, the Board of Port Commissioners will consider whether to adopt the Climate Action Plan at a public Board meeting.

As outlined in the table above, the Port's Climate Action Plan has been developed and will be implemented to address each of these guideline elements using current guidance in climate change planning that was available during the development of this plan.

A.3 Climate Action Plan Adoption under CEQA

Adoption of the Climate Action Plan by the Port is considered a project under CEQA. Although the purpose of this Climate Action Plan is to reduce the Port's GHG emissions, contribution to global climate change and overall impact on the environment, any potential for adverse impacts on the physical environment resulting from implementation must be considered. To be approved, the Port conducted an environmental review of the Climate Action Plan to determine if the plan and proposed GHG reduction measures will result in any significant environmental impacts. The Board of Port Commissioners will consider whether to adopt the Climate Action Plan at a public Board meeting.

A.4 GHG Reduction Appendices

Appendices A through F and G encompass the supporting documentation that supplements the Main Report with regard to GHG reduction. A listing of the GHG reduction appendices is as follows:

- **Appendix A – Climate Action Plan's Relationship to CEQA:** This document, which discusses the relationship of the Port's Climate Action Plan to CEQA.
- **Appendix B – Greenhouse Gas Inventory Documentation:** Presents the baseline (2006) and future (2020, 2035, and 2050) GHG inventories. Includes discussion on inventory development, boundaries, methodology, and sources of data.
- **Appendix C – Greenhouse Gas Reduction Measures:** Presents a discussion on how the original reduction measures were selected, evaluated, and categorized.

- **Appendix D – Greenhouse Gas Reduction Targets:** Presents a discussion on options for GHG reduction goals and the selection of a goal for the Port.
- **Appendix E – Quantifying Greenhouse Gas Reduction Measures to Achieve Reduction Targets:** Presents the analysis for quantifying GHG reductions from the original reduction measures to achieve potential GHG reduction goals.
- **Appendix F – Implementation and Monitoring Plan:** Presents a framework for the Port to implement reduction measures. Also discusses how progress towards the GHG reduction goal will be monitored by the Port.
- **Appendix G – Public Process:** Presents a summary of the Port's meetings and public process during development of the Climate Action Plan from 2010-2013.

A.6 References

Bay Area Air Quality Management District (BAAQMD). 2011. CEQA Air Quality Guidelines. May. Available at:

<http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx?la=en> Accessed February 28, 2012.

California Code of Regulations, Title 14 (CEQA Guidelines). Available at:

http://ceres.ca.gov/ceqa/docs/Adopted_and_Transmitted_Text_of_SB97_CEQA_Guidelines_Amendments.pdf Accessed February 29, 2012.

Governor's Office of Planning & Research (OPR). 2012. CEQA and Climate Change.

Available at: http://www.opr.ca.gov/s_ceqaandclimatechange.php. Accessed February 28, 2012.

Governor's Office of Planning and Research (OPR). 2011. Climate Action Planning. Local

Government Roundtable. June 20. Available at: <http://opr.ca.gov/docs/capppt.pdf> Accessed July 23, 2012.

Appendix B - Greenhouse Gas Inventory Documentation

B.1 Executive Summary

For the San Diego Unified Port District's (the Port's) Climate Action Plan, greenhouse gas (GHG) inventories were developed for a baseline year (2006) and several future projected years (2020 business as usual or BAU, 2020 with known regulations, 2035, and 2050) using standard methodologies and models current at the time of the inventory development in 2011 and 2012. These inventories are presented in more detail below but are summarized by sector in Table ES-1 and by activity type in Table ES-2. Sectors evaluated included energy (electricity and natural gas), water use and wastewater, on-road transportation, off-road transportation and equipment, and waste. Activities evaluated were those that occurred within the Port's jurisdiction such as GHG emissions from industrial, lodging, and ocean-going vessels. Table ES-1 also presents the percentage increase in future year emission estimates as compared to the baseline year of 2006.

A graphical summary of the contributions from each of the sectors evaluated is shown in Figure ES-1 for all years estimated for the Climate Action Plan except for the 2020 BAU case that was used for reference purposes to determine inventory reductions due to existing regulations. A graphical summary of contributions by activity or land use is shown in Figure ES-2.

B.2 Introduction

As described in Appendix A, California Environmental Quality Act (CEQA) Guidelines for GHG emissions reduction plans, such as the Port's Climate Action Plan, have been developed by the California Office of Planning and Research (OPR) and adopted by the California Natural Resources Agency (CNRA). The guidelines (CEQA Guidelines section 15183.5) specify that a plan for the reduction of GHG emissions should include or address specific elements. Two of these elements include:

- Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic range, and
- Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area.

To address these two elements for the Port's Climate Action Plan, GHG inventories were developed for a baseline year and several future projected years for all operations under the Port's jurisdiction. This Appendix discusses the development of these GHG inventories, including the inventory years chosen, activities included, geographic boundaries, emission sectors included, calculation methodology, Port growth projections for future estimates, and a discussion of which regulations were taken into account in the future projected years. While the description below provides an overview of the development of the inventories, further details are presented in the inventory tables included in this Appendix.

The tables in this Appendix include the GHG inventory calculations for all sectors for all years estimated. The following groupings of tables are included and their relationship to each sector evaluated is summarized in Table ES-3:

- Summary Tables (ES series)
- Input Parameter Tables (IN series)
- Emission Factors Tables (EF series)
- 2006 Inventory Tables (A series)
- 2020 BAU Inventory Tables (B series)
- 2020 Inventory Tables (C series)
- 2035 Inventory Tables (D series)
- 2050 Inventory Tables (E series)

The remainder of this Appendix describes the inventory development including the inventory years selected, the scope of the developed inventories, and specific methodologies utilized to estimate emissions for each sector and activity.

B.3 Inventory Year Selection

The development of the Climate Action Plan required estimates for both a baseline year and at least one future projected year.

Baseline Year

Many jurisdictions that have completed or are working on a GHG inventory for climate action planning are finding that a baseline year more recent than the California Global Warming Solutions Act (AB 32) baseline of 1990 is more practical and accurate to calculate. While a more recent year is not consistent with the AB 32 baseline, estimating emissions from 1990 requires many assumptions for data gaps that would make such an inventory highly speculative and an unreliable data set for the Climate Action Plan's decision-making process. The selection of a more recent baseline year is also compatible with OPR guidance provided during its June 20, 2011, Local Government Roundtable regarding climate action planning¹ and with other recent climate action planning guidance documents such as the Bay Area Air Quality Management District's (BAAQMD's) CEQA Air Quality Guidelines.²

Based on the above considerations and Climate Action Plan development discussions during the Port's Climate and Energy Work Group (Work Group; a sub-group of the Board of Port Commissioner's Environmental Advisory Committee) meetings, members of the Work Group

¹ OPR. 2011. Climate Action Planning. Local Government Roundtable Questions and Answers. June 20. Available from: <http://opr.ca.gov/docs/capfaqg.pdf> . Accessed July 23, 2012.

² BAAQMD. 2011. CEQA Air Quality Guidelines. May. Available from: <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx?la=en> Accessed February 28, 2012.

determined that a relatively recent year inventory (2006) was to be developed for the Climate Action Plan. The Work Group's decision to use a 2006 inventory year for the baseline was based mainly on the following:

1. An existing 2006 Maritime inventory³ was available, which accounts for a significant portion of the Port's overall inventory,
2. 2006 data for other Port tenants not inventoried previously was more readily available and more accurate than data for earlier years such as 1990,
3. 2006 was a typical economic condition for the Port compared to the temporary economic downturn of more recent years, and
4. 2006 data aligns with baseline years used for other recent inventories and climate action plans, including those of the San Diego Association of Governments (SANDAG) and San Diego County.

In addition, the availability of an existing recent inventory (the Port's 2006 Maritime Inventory) saved a considerable amount of effort in preparing the overall Port's inventory.

Future Projected Years

Future Port inventory projections were made for 2020 and 2050 and are consistent with the State's goals under AB 32 and Executive Order (EO) S-3-05. At the request of the Work Group, a projected inventory for 2035 was also developed to reflect a midpoint between 2020 and 2050 projected inventories.

B.4 Scope of Inventories Developed

The Port is different than the cities and counties that have previously developed GHG reduction plans, as it has more restrictive land-use (e.g., no residential or agriculture land use is present within the Port's jurisdiction) and have tenants whose operations are different than typical commercial and industrial operations that are present in cities/counties (e.g., use of ocean-going vessels and more extensive use of off-road engines such as cargo handling equipment). Therefore, for a port, no template for the development of the scope of a GHG inventory in support of a GHG reduction plan was available. Thus, the scope of the Port's emission inventories was developed through technical discussions with the Port's Work Group and focused on the operations within the jurisdiction of the Port. The GHG emission inventories developed in support of the Climate Action Plan include the following categories of operations and tenants under the Port's jurisdiction:

1. Port operations – Emissions from the Port's own operations were derived from activity data provided by the Port for year 2006, and are consistent with the data used for the Port's 2008 The Climate Registry (TCR) report,

³ POSD. 2008a. 2006 Emissions Inventory. March 2008. Prepared by Starcrest Consulting Group, LLC. Available from: http://sandiegohealth.org/port/2006_emissions_inventory_final.pdf. Accessed July 23, 2012.

2. Maritime operations⁴ – Maritime operation emissions were primarily derived from the Port's 2006 Maritime Inventory,⁵ and
3. Other tenants – Emissions were derived from a mix of Port activity data⁶ in conjunction with statewide or local metrics and data provided directly from participating tenants.

The Port's emission inventories include GHG emissions from all known tenants and activities existing in 2006 and those reasonably anticipated to exist by 2020 (based on a list of anticipated future projects provided by Port staff) that are under the Port jurisdiction. The following sectors of emissions are included:

1. Energy
2. Water Use and Wastewater
3. On-road transportation
4. Off-road transportation
5. Waste

Geographic considerations for the scope of the inventory were determined by specific activities in each sector and were included as follows:

- Geographic boundaries for energy and water use and waste generation are based on usage or generation within the Port's jurisdiction,
- Geographic boundaries for on-road vehicle emissions are defined by trips originating or terminating within Port's jurisdiction, and
- Geographic boundaries for off-road vehicle and equipment emissions are consistent with the Port's 2006 Maritime Inventory⁷ and include county and state waters (except for cargo handling equipment and cruise terminal transportation which is limited to maritime terminals).

The South Bay Power Plant is also within the Port's jurisdiction and would be within the geographic boundaries of the Port's GHG inventory; however, the South Bay Power Plant is not included in this GHG inventory due to unique circumstances. Cities and counties do not typically include power plants located within their jurisdiction; although, as indicated above, there is no standard template for the inventory development of a port in support of a GHG reduction plan. Also, the plant stopped operations in December 2010. Its 2008 GHG emissions reported to the

⁴ "Maritime Operations" refers to those sources that are included in the Port's 2006 Maritime Air Emissions Inventory. There are other maritime-related sources that are included in the "Other Tenants" category including shipbuilding, boatyards, and recreational boating.

⁵ POSD 2008a.

⁶ Activity data refers to the square footage, parcel footprint, and/or slip count for each tenant. This was provided by the Port.

⁷ POSD 2008a.

California Air Resources Board (ARB) for mandatory greenhouse gas reporting was 628,773 metric tons carbon dioxide equivalent (MT CO₂e).⁸ If the South Bay Power Plant was included in the Port's 2006 baseline inventory,⁹ this would have constituted approximately 44% of the Port's total inventory. For that year, ceasing operations of this source would have resulted in an approximately 42% reduction of emissions for the Port's 2020 projected inventory as compared to the 2006 baseline year. The Work Group recommended not to include the South Bay Power Plant in the Port's GHG inventory because this reduction in emissions in 2020 compared to the 2006 baseline may have given the impression that the Port would have already achieved state goals for emission reductions (see Appendix D on a discussion on setting reduction goals), and that no further Port actions would appear to be needed. Instead, the Work Group wanted the Climate Action Plan to focus on the Port's current known operations and to evaluate potential reduction measures that would reduce emissions from these existing operations.

Inventories were developed for the following years:

1. 2006 (baseline year)
2. Projected 2020 BAU (without regulations)
3. Projected 2020 (including known regulations)
4. Projected 2035 (including known regulations)
5. Projected 2050 (including known regulations)

The 2020 BAU scenario projects the Port's inventory forward without accounting for reductions from currently approved government regulations. The 2020, 2035, and 2050 scenarios project the Port's inventory forward while accounting for anticipated reductions from currently approved regulations for sources within the scope of the Port's inventory and for known growth in Port operations.

B.5 Methodology for Inventory Development

The inventory for all years was developed using a combination of data supplied by the Port, previously developed inventories, Statewide or San Diego-specific data, or data provided by participating tenants. Data provided by tenants and the Port was always used before Statewide or San Diego default values.

A description of the emission estimation methodology for each sector included in the inventories is presented in Sections B.4.1 – B.4.5. Following standard practices in developing inventories, energy, water, transportation, and waste intensities/usage rates are often based on tenant building square footage, employee, and/or boat slip count data. Building square footage and

⁸ Available from: <https://ghgreport.arb.ca.gov/eats/carb> Accessed September 27, 2010. This total only includes GHG emissions from stationary combustion processes and sulfur hexafluoride (SF₆) releases.

⁹ For purposes of this estimate, South Bay Power Plant emissions accounted for include those reported to ARB plus additional emissions associated with building electricity and natural gas use, water use, and related on-road transportation.

boat slip count data were provided by the Port. To estimate employee counts, square footage was converted to an estimated number of employees using the Southern California Association of Governments (SCAG) 2001 Employment Density Study Summary Report.¹⁰ (Table IN-1)

Future Projection Methodology

The 2006 baseline inventory includes all known tenants and activities which were on the Port tidelands in the year 2006. All future projected inventories were built upon this baseline inventory by including anticipated land use development projects that are projected to be built or implemented within the Port's jurisdiction by 2020, as well as projected maritime growth (cargo and cruise activity) from previously published studies. Land use development projects beyond 2020 are not included due to the speculative nature of their implementation and the inherent growth restrictions of the Port's jurisdiction. The projected 2020, 2035 and 2050 inventories account for continued maritime growth, as projected by the San Diego Unified Port District Maritime Business Plan¹¹ and the San Diego Unified Port District Cruise Market Update.¹² Per the San Diego Unified Port District Maritime Business Plan, cargo activity is projected to grow at 3% annually from 2006 through 2020, 32% from 2020 to 2030, and 3% annually from 2030 through 2050, with growth capped at the terminal capacities. Per information provided by the Port, cruise activity is projected to grow 10% from 2006 through 2020. Per the San Diego Unified Port District Cruise Market Update (which factored in the 2008 economic downturn), cruise activity is projected to grow 81% from 2020 to 2035 and 16% from 2035 to 2050. Non-maritime related growth was not included in the future project inventories unless specific projects were anticipated.

Reductions due to currently approved regulations are accounted for in all future projected inventories, except for the 2020 BAU scenario. Reductions due to the following regulations are included:

1. Renewables Portfolio Standard (RPS)¹³
2. Pavley Vehicle Standards^{14,15}
3. Low Carbon Fuel Standard (LCFS)^{16,17}

¹⁰ SCAG. 2001. Employment Density Study Summary Report. October 31. Available from: http://www.scag.ca.gov/pdfs/Employment_Density_Study.pdf. Accessed July 23, 2012.

¹¹ POSD. 2008b. San Diego Unified Port District Maritime Business Plan. December 2008. Figure 4.4-1 Cargo Projections, Current Markets

¹² POSD. 2011. San Diego Unified Port District, Cruise Market Update. June 2011. Figure 23 - Port of San Diego Passenger Growth Composite, 2000-2040

¹³ CPUC. 2011. Order Instituting Rulemaking Regarding Implementation and Administration of the Renewables Portfolio Standard Program. May 2011. Available from: http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/134980.pdf. Accessed July 23, 2012.

¹⁴ ARB. 2002. Assembly Bill No. 1493 ("Pavley"). July 2002. Available from: <http://www.arb.ca.gov/cc/ccms/documents/ab1493.pdf>. Accessed July 23, 2012.

¹⁵ ARB. 2010c. Pavley 1 and Low Carbon Fuel Standard Postprocessor Version 1.0. Available from: <http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>. Accessed July 23, 2012.

4. Heavy Duty (Tractor-Trailer) GHG Regulation¹⁸
5. Ocean-going Vessels (OGV) Fuel Switch Regulation¹⁹
6. Shore Power for OGV²⁰

B.5.1 Energy

GHG emissions from electricity²¹ and stationary combustion sources (natural gas and diesel) are included for Port operations, Maritime operations,²² and other Port tenants.

- Electricity and Natural Gas
 - Building Energy Intensities (Tables A/B/C/D/E -1 and 2)
 - When not provided by the tenant or the Port, electricity and natural gas intensities were derived from the 2006 California Commercial End-Use Survey (CEUS), provided by the California Energy Commission (CEC).²³ Energy usage rates are based on 2002 consumption data for all existing tenants. Building additions due to future projects were adjusted for 2005 and/or 2008 California Code of Regulations Title 24 standards, depending on what year they are projected to be built. Adjustments to reflect 2005 and 2008 Title 24 standards were made per data provided in CEC Impact Analysis reports.^{24,25}
 - CEUS data was used from San Diego Gas & Electric (SDG&E) Zone 13, which is the sector in which the Port is located.

¹⁶ ARB. 2009. Low Carbon Fuel Standard. Final Regulation Order. Available from: <http://www.arb.ca.gov/regact/2009/lcfs09/lcfscombofinal.pdf>. Accessed July 23, 2012.

¹⁷ The Low Carbon Fuel Standard is accounted for in future inventories, with the recognition that it is currently being challenged.

¹⁸ ARB. 2011a. Heavy-Duty (Tractor-Trailer) Greenhouse Gas Regulation. Available from: <http://www.arb.ca.gov/cc/hdghg/hdghg.htm>. Accessed July 23, 2012.

¹⁹ ARB. 2011b. Ocean-going Vessels - Fuel Rule. Available from: <http://www.arb.ca.gov/ports/marinevess/ogv.htm>. Accessed July 23, 2012.

²⁰ ARB. 2011c. Shore Power for Ocean-going Vessels. Available from: <http://www.arb.ca.gov/ports/shorepower/shorepower.htm>. Accessed July 23, 2012.

²¹ Emissions from electricity use account for the indirect emissions from the power plant generating the electricity.

²² The Port's 2006 Maritime Emission Inventory did not include emissions from the electricity and natural gas use of the buildings occupied by the maritime tenants, therefore it is accounted for here.

²³ CEC. 2006a. California Commercial End-Use Survey. Prepared by Itron Inc. Available from: <http://www.energy.ca.gov/ceus/>. Accessed July 23, 2012.

²⁴ CEC. 2003. Impact Analysis: 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Available from: http://www.energy.ca.gov/title24/2005standards/archive/rulemaking/documents/2003-07-11_400-03-014.PDF. Accessed July 23, 2012.

²⁵ CEC. 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Available from: http://www.energy.ca.gov/title24/2008standards/rulemaking/documents/2007-11-07_IMPACT_ANALYSIS.PDF. Accessed July 23, 2012.

- Non-Building Intensities²⁶ (Tables A/B/C/D/E -2)
 - When not provided by the tenant or the Port, electricity and natural gas intensities for activities outside of standard building energy use were estimated for the following tenant activity types using metrics developed from participating representative tenants.
 - Yacht Clubs
 - Marinas
 - Sport Fishing
 - Commercial Sport Fishing
 - Boatyards
 - Shipbuilding
- Emission Factors
 - Electricity Use (Tables EF-1 and EF-2)
 - Carbon dioxide (CO₂) emission factors for electricity use were derived from SDG&E Power/Utility Protocol (PUP) Reports.²⁷
 - Methane (CH₄) and nitrous oxide (N₂O) emission factors were derived from the California Climate Action Registry (CCAR) General Reporting Protocol (GRP) Version 3.1.²⁸
 - CO₂, CH₄ and N₂O emission factors were derived from the CCAR GRP V 3.1²⁹.
 - Natural Gas Use (Table EF-1)
 - Natural Gas factors were derived from the CCAR GRP V 3.1.³⁰
- Natural Gas and Diesel Stationary Combustion
 - For some tenants, GHG emissions from natural gas stationary combustion were reported to the ARB under the Mandatory Reporting Regulation. In these instances, 2008 GHG emissions reported to ARB were used.³¹
 - Fuel Usage (Tables A/B/C/D/E -3 and -4)

²⁶ Non-building intensities include usage from activities such as slip power, boat lifts, power tools, welding, or other activities that are outside of general building electricity and natural gas use.

²⁷ SDG&E. 2011. 2006, 2007, and 2008 Power/Utility Protocol (PUP) Reports. Available from: <http://www.climateregistry.org/tools/carrot/carrot-public-reports.html>. Accessed July 23, 2012.

²⁸ CCAR. 2009. General Reporting Protocol, Version 3.1. Available from: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf. Accessed July 23, 2012.

²⁹ CCAR. 2009.

³⁰ CCAR. 2009.

³¹ ARB. 2010b. Mandatory Greenhouse Gas Reporting. Available from: http://arb.ca.gov/cc/reporting/ghg-rep/regulation/2010_regulation.htm. Accessed July 23, 2012.

- The quantity of natural gas and diesel fuel used was either provided directly by tenants or estimated from information provided by the Port.
- Emission Factors (Table EF-3)
 - Natural gas factors were described above.
 - CO₂, CH₄ and N₂O emission factors for diesel stationary combustion sources were derived from CCAR GRP V 3.1.³²

B.5.2 Water Use & Wastewater

GHG emissions from the electricity needed to supply, convey, treat,³³ and distribute both indoor and outdoor water use are included for all Port operations, maritime operations,³⁴ and other Port tenants.

- Building Water Usage Rates³⁵ (Tables A/B/C/D/E -5 and 6)
 - When not provided by the tenant or the Port, indoor and outdoor water usage rates were derived from Pacific Institute's "Waste Not Want Not" report³⁶ in conjunction with data from the US Census Bureau.³⁷ (Table IN-2)
- Non-Building Water Usage Rates³⁸ (Tables A/B/C/D/E -6)
 - When not provided by the tenant or the Port, water usage rates for activities outside of the standard building water use were estimated for the following tenant types using metrics developed from participating representative tenants.
 - Rental Car Facilities
 - Car Washes
 - Yacht Clubs
 - Marinas
 - Sport Fishing
 - Commercial Sport Fishing

³² CCAR. 2009.

³³ Wastewater treatment is included for all indoor water use.

³⁴ The Maritime Inventory did not include emissions from water use by the maritime tenants, therefore it is accounted for here.

³⁵ Building water use rates include associated outdoor water use for standard activities such as landscape watering.

³⁶ Gleick, P.H.; Haasz, D.; Henges-Jeck, C.; Srinivasan, V.; Cushing, K.K.; Mann, A. 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California. Published by the Pacific Institute for Studies in Development, Environment, and Security. Available from: http://www.pacinst.org/reports/urban_usage/. Accessed July 23, 2012.

³⁷ US Census Bureau. 2000 Census. Table QT-H1: General Housing Characteristics 2000. Available from: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>. Accessed July 23, 2012.

³⁸ Non-building intensities include water usage from activities such as boat cleaning, slip water, car washes, or other activities that are outside of the standard building water use.

- Boatyards
- Energy Intensity (Table IN-3)
 - Energy intensities (kilowatt hours per gallon, or kWh/gal) for indoor and outdoor water use are derived from the 2006 CEC Report, Refining Estimates of Water-Related Energy Use in California³⁹ and are representative of Southern California distribution patterns. This includes energy used for water supply and conveyance, treatment, distribution, and wastewater treatment (for indoor water).
 - Direct GHG emissions from the wastewater treatment plant were not included in the Port's inventories as they are not located within the Port's jurisdiction.
- Emission Factors (Tables EF-1 and EF-2)
 - Since water usage rates are turned into equivalent kilowatt hours consumed, the CO₂, CH₄, and N₂O emission factors are the same as those used above for electricity use.

B.5.3 On-road Transportation

GHG emissions from the combustion of fuel for commute, customer, vendor, or otherwise generated on-road vehicle activity are included for all Port operations, maritime operations, and other Port tenants.

- Commute/Customer/Vendor Trips (Tables A/B/C/D/E -7)
 - GHG emissions from commute, customer, and vendor trips were estimated by calculating a generated quantity of vehicle miles traveled (VMT) using trip generation rates and trip lengths based on land use type, specific to the San Diego Region.
 - Vehicle Miles Traveled
 - When not provided by the tenant or the Port, VMT were estimated using trip generation rates and trip lengths as follows:
 - Trip generation rates for all tenant types are from the San Diego Municipal Code, Land Development Code, Trip Generation Manual⁴⁰ (City of San Diego, 2003) and the SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region.⁴¹ Weekday trip rates were assumed to apply on the weekends. (Table IN-4)

³⁹ CEC. 2006b. Refining Estimates of Water-Related Energy Use in California. PIER Final Project Report. Prepared by Navigant Consulting, Inc. CEC-500-2006-118. Available from: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>. Accessed July 23, 2012.

⁴⁰ City of San Diego. 2003. San Diego Municipal Code, Land Development Code, Trip Generation Manual. May 2003. Available from: <http://www.sandiego.gov/planning/pdf/tripmanual.pdf>. Accessed July 23, 2012.

⁴¹ SANDAG. 2002. SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region. April 2002. Available from: http://www.sandag.org/uploads/publicationid/publicationid_1140_5044.pdf. Accessed July 23, 2012.

- Trip lengths are from SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region⁴² and represent average weighted trip lengths for all trips to and from the general land use site. (Table IN-5)
- Trips due to the transportation of waste to the landfill are accounted for in the average trip rates and trip lengths above.
- Emission Factors (Table EF-4)
 - The fleet-wide running and starting CO₂ emission factors were calculated from EMFAC2007⁴³ for San Diego County for the respective year (2006, 2020, 2035, or 2040). 2040 is the latest year EMFAC2007 projects to, therefore this year was conservatively assumed to be representative of 2050 emission factors.
 - CH₄, N₂O, and hydrofluorocarbons (HFCs) emissions from on-road vehicles were accounted for per the United States Environmental Protection Agency (USEPA) recommendation that CH₄, N₂O, and HFCs makeup 5% of CO₂e emissions.⁴⁴
- Other On-road Transportation⁴⁵ (Tables A/B/C/D/E -8)
 - Emissions from other on-road transportation are based on fuel usage quantities rather than VMT.
 - Fuel Use
 - When not provided by the tenant or the Port, fuel usage rates for other on-road transportation activities were estimated for the following tenant types using metrics developed from participating representative tenants.
 - Rental Car Facilities
 - Boatyards
 - Shipbuilding
 - Emission Factors (Table EF-5)
 - CO₂ emission factors for on-road transportation were derived from CCAR GRP V 3.1⁴⁶ for fuels including gasoline, diesel, and liquefied petroleum gas (LPG)/propane.
 - CH₄ and N₂O emission factors for LPG/propane use were derived from CCAR GRP V 3.1.⁴⁷

⁴² CEC. 2006b.

⁴³ ARB. 2007. Emission FACtor Model (EMFAC). Available from: http://www.arb.ca.gov/msei/onroad/latest_version.htm. Accessed July 23, 2012.

⁴⁴ USEPA. 2005. EPA420-F-05-004. Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle. Office of Transportation and Air Quality. February.

⁴⁵ Other on-road transportation emissions include emissions from company vehicles, rental cars, or other vehicle emissions that are not accounted for under the commute, customer, and vendor trips.

⁴⁶ CCAR. 2009.

- The USEPA recommends assuming that CH₄, N₂O, and HFCs are 5% of emissions on a CO₂e basis. Therefore, CO₂ emissions from gasoline and diesel use were divided by 95% to account for CH₄, N₂O, and HFCs.
- Maritime Emissions (Tables A/B/C/D/E -11)
 - Emissions from on-road maritime operations including heavy duty vehicles and cruise terminal transportation are included in the baseline and future inventories per the Maritime Inventory.⁴⁸ **Error! Bookmark not defined.** While the Maritime Inventory is reflective of 2006 operations, future projected inventories account for maritime growth (cargo and cruise activity), as projected by the San Diego Unified Port District Maritime Business Plan⁴⁹ and the San Diego Unified Port District Cruise Market Update,⁵⁰ respectively. Heavy duty vehicle operations and cruise terminal transportation were assumed to scale accordingly with cargo and cruise vessel growth, as they are supporting activities.

B.5.4 Off-road Transportation (Tables A/B/C/D/E -9)

GHG emissions from the combustion of fuel in off-road transportation activities related to Port operations, maritime operations, and other Port tenants are included. This includes emissions such as off-road equipment activity, ocean-going vessels, and recreational boating.

- Emissions from off-road transportation⁵¹ are based on fuel usage quantities, excluding recreational boating which was derived from OFFROAD2007.⁵²
- Fuel Use
 - When not provided by the tenant or the Port, fuel usage rates for off-road transportation activities were estimated for the following tenant types using metrics developed from participating representative tenants.
 - Yacht Clubs
 - Marinas
 - Sport Fishing
 - Commercial Sport Fishing
 - Boatyards

⁴⁷ CCAR 2009.

⁴⁸ POSD. 2008a.

⁴⁹ POSD 2008b.

⁵⁰ POSD 2011.

⁵¹ Off-road transportation includes emissions from off-road equipment such as cranes and travel lifts, as well as emissions from internal boat use at marinas, yacht clubs, etc. (boating emissions that would not be covered under recreational boating).

⁵² ARB. 2006. Off-Road Emissions Inventory Program (OFFROAD2007). Available from: <http://www.arb.ca.gov/msei/offroad/offroad.htm>. Accessed July 23, 2012.

- Shipbuilding
- Lumber Yards
- Emission Factors (Table EF-6)
 - CO₂, CH₄ and N₂O emission factors for off-road transportation were derived from CCAR GRP V 3.1⁵³ for fuels including gasoline, diesel, and LPG/propane.
- Recreational Boating Emissions
 - OFFROAD2007 was run for San Diego County for the respective year (2006, 2020, 2030, and 2040). 2040 is the latest year OFFROAD2007 projects to, therefore this was assumed to be representative of 2050 emissions. For years 2035 and 2040, emissions were adjusted to scale according to the projected population growth from 2020 to 2050 in the San Diego Region.⁵⁴ The total emissions were then scaled by the % of boating days spent on the Ocean versus the Delta, San Diego Bay, and Inland Lakes for residents within the South Coast over years 2007-2008.⁵⁵ This assumption, in effect, adjusts the San Diego County boat population and activity to reflect only those boats which are active off of the coastline of San Diego County. The fleet mix and boating habits within San Diego County are assumed to be similar to that surveyed in the South Coast. Total emissions from boating activity in the ocean (off the San Diego County coastline) were then adjusted by the portion of slip area present within the Port versus the slip area present within the San Diego County coastline.
- Maritime Emissions (Tables A/B/C/D/E -11)
 - Emissions from off-road maritime operations including ocean-going vessels, commercial harbor craft, cargo handling equipment, and locomotives, are included in the baseline and future inventories per the Maritime Inventory.⁵⁶ While the Maritime Inventory is reflective of 2006 operations, future projected inventories account for maritime growth (cargo and cruise activity), as projected by the San Diego Unified Port District Maritime Business Plan⁵⁷ and the San Diego Unified Port District Cruise Market Update,⁵⁸ respectively. Commercial harbor craft, cargo handling equipment, and locomotives were assumed to scale accordingly with cargo and cruise vessel growth, because they are supporting activities.

⁵³ CCAR 2009.

⁵⁴ SANDAG. 2011. 2050 Regional Transportation Plan. Technical Appendix 2. Available from: <http://www.sandag.org/uploads/2050RTP/F2050RTPTA2.pdf>. Accessed July 23, 2012.

⁵⁵ California Coastal Commission. 2011. 2007-2009 California Boater Survey. July 2011. Available from: <http://www.coastal.ca.gov/ccbn/materialsforeducators.html>. Accessed July 23, 2012.

⁵⁶ POSD 2008a.

⁵⁷ POSD 2008b.

⁵⁸ POSD 2011.

B.5.5 Waste (Tables A/B/C/D/E -10)

GHG emissions from the decomposition of municipal solid waste generated by Port operations, maritime operations, and other Port tenants are included in the Port's inventories. These emissions occur offsite at the landfill(s). Emissions from the combustion of fuel in the on-road activity required to transfer the waste from the Port tidelands to the landfill(s) are included in the on-road transportation sector above.

- Waste Disposal Rates and Waste Characteristics (Tables IN-6, IN-7, IN-8, and IN-9)
 - When not provided by the tenant or the Port, waste disposal rates, waste profiles, and waste densities were derived from the California Integrated Waste Management Board Statewide Waste Characterization Studies.^{59,60}
- Emission estimates follow California Emissions Estimator Model™ (CalEEMod™) guidance,⁶¹ which quantifies GHG Emissions associated with the decomposition of waste (CH₄ generation) based on the total amount of degradable organic carbon (DOC). Further, CO₂ emissions from the combustion of CH₄ are quantified based on the assumed collection and destruction efficiency of the landfill gas and the oxidation efficiency of methane.
 - The DOC was derived from the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories.⁶²
 - The degradable anaerobic fraction (DANF) was derived from the California Air Resources Board Local Government Operations Protocol.⁶³
 - Per CalEEMod™ guidance, the following assumptions were used
 - Oxidation efficiency of CH₄ of 10%
 - Destruction efficiency of landfill gas of 98%
 - The collection efficiency of landfill gas was assumed to be 67% for 2006 and 80% for future projected years per the San Diego County GHG Inventory.⁶⁴

⁵⁹ CIWMB. 1999. Statewide Waste Characterization Study Results and Final Report. Table 12. December. Available from: <http://www.calrecycle.ca.gov/publications/LocalAsst/34000009.pdf>. Accessed July 23, 2012.

⁶⁰ CIWMB. 2006. Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups. Contractor's Report to the Board. June. Table 19. Available from: <http://www.calrecycle.ca.gov/publications/Disposal/34106006.pdf>. Accessed July 23, 2012.

⁶¹ CalEEMod. 2010. Available from: <http://www.caleemod.com/>. Accessed July 23, 2012.

⁶² IPCC. 2006. Guidelines For National Greenhouse Gas Inventories. Volume 5, Chapter 2. Available from: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_2_Ch2_Waste_Data.pdf. Accessed July 23, 2012.

⁶³ ARB. 2010a. Local Government Operations Protocol For the quantification and reporting of greenhouse gas emissions inventories. Version 1.1. May. Available from: http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf. Accessed July 23, 2012.

⁶⁴ EPIC. 2011. San Diego Greenhouse Gas Inventory. Available from: <http://www.sandiego.edu/epic/ghginventory/>

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Baseline (2006) GHG Emissions by Sector

826,429 metric tons CO₂e

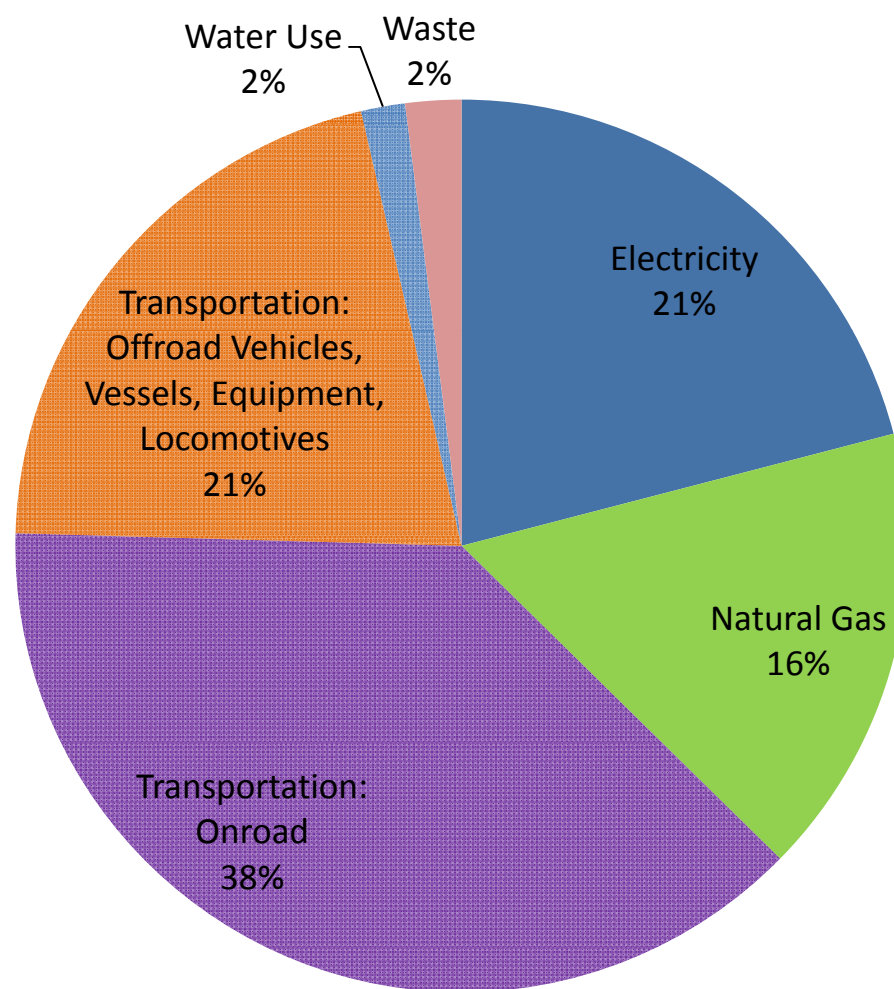


Figure ES-1

Future (2020) GHG Emissions by Sector

855,489 metric tons CO₂e

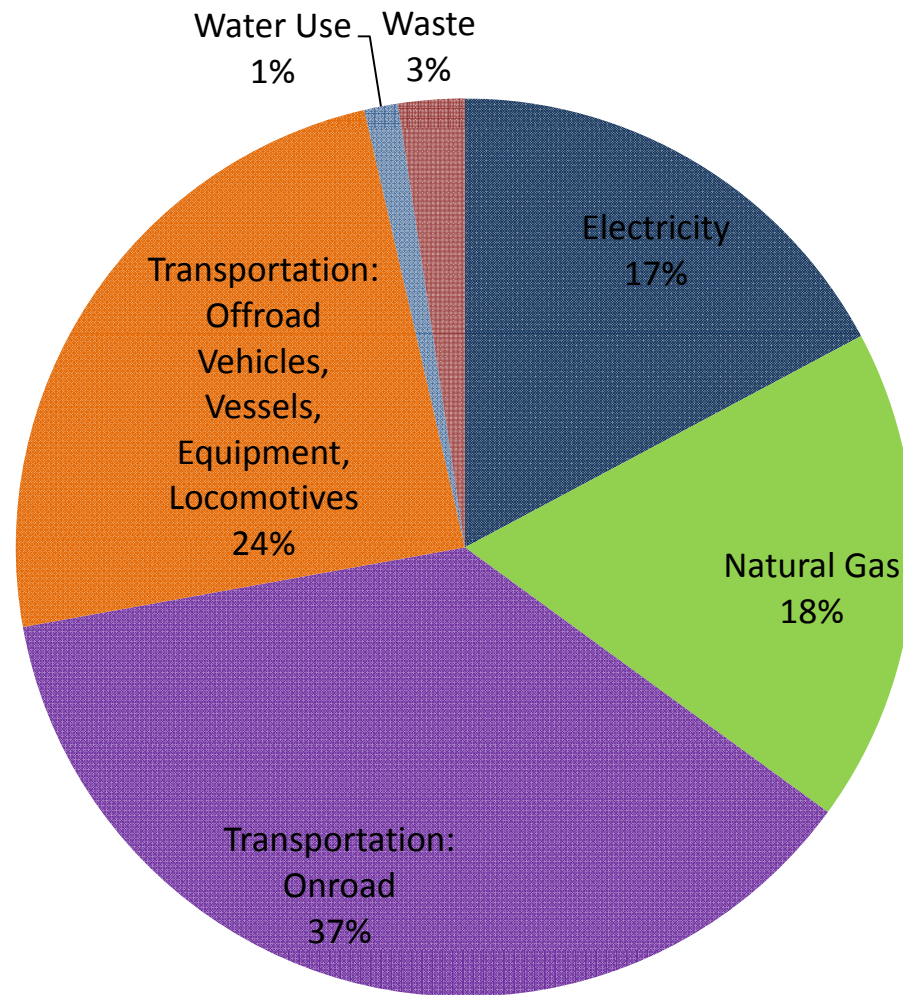


Figure ES-1

Future (2035) GHG Emissions by Sector

907,177 metric tons CO₂e

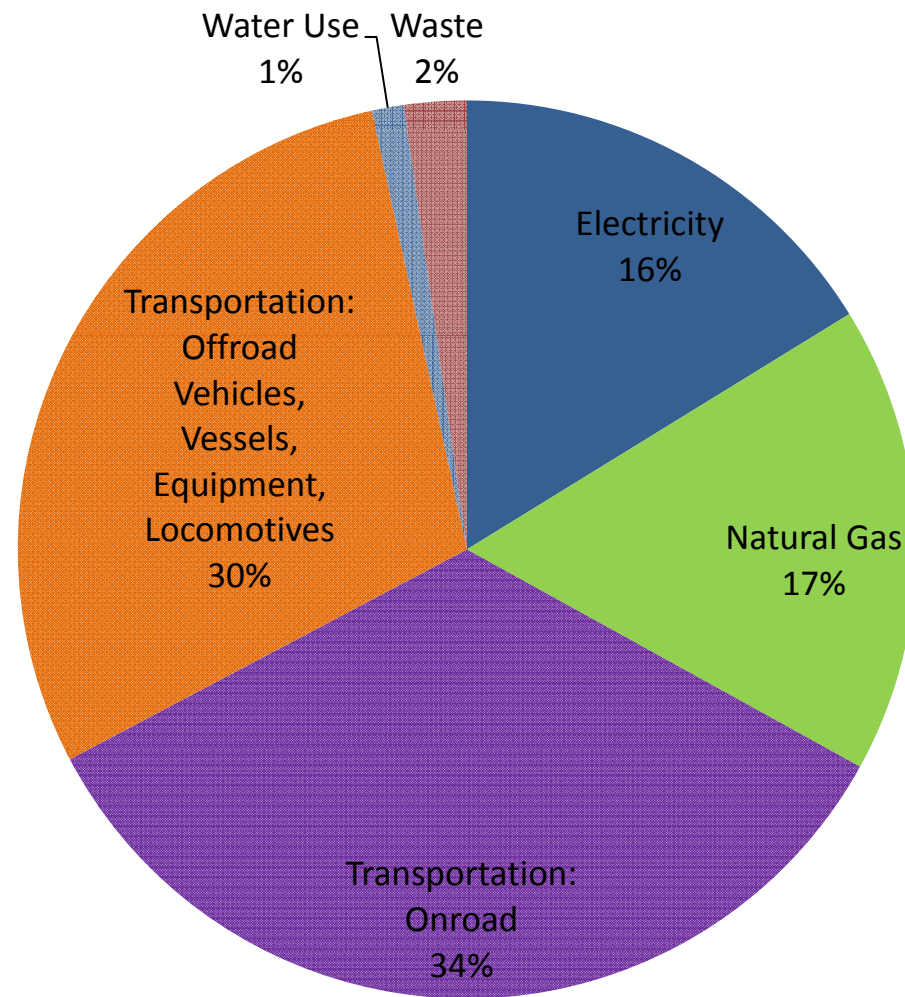


Figure ES-1

Future (2050) GHG Emissions by Sector

929,629 metric tons CO₂e

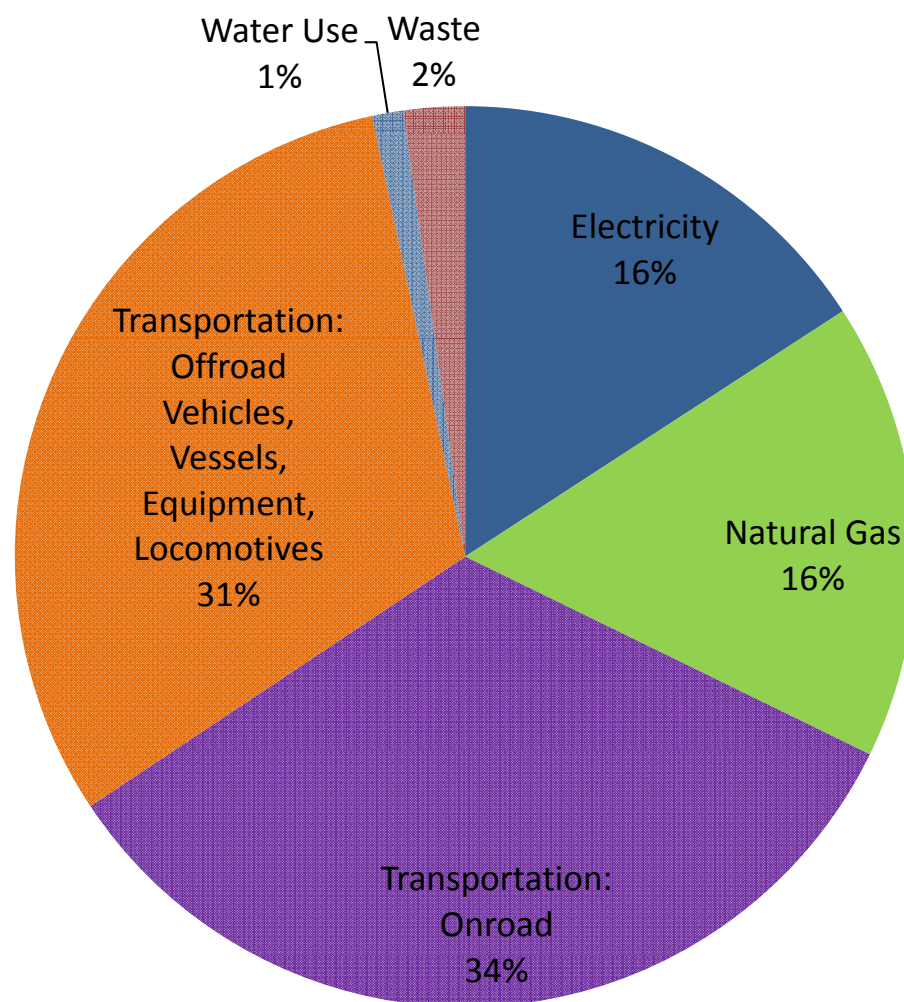
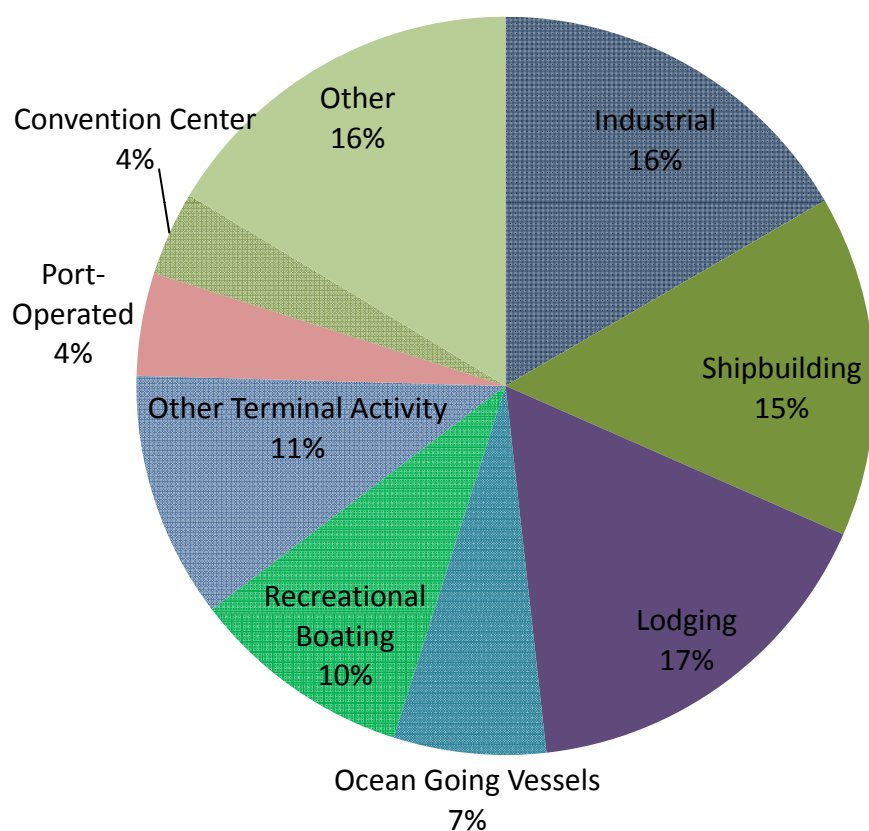


Figure ES-1

Baseline (2006) GHG Emissions by Activity

826,429 metric tons CO₂e

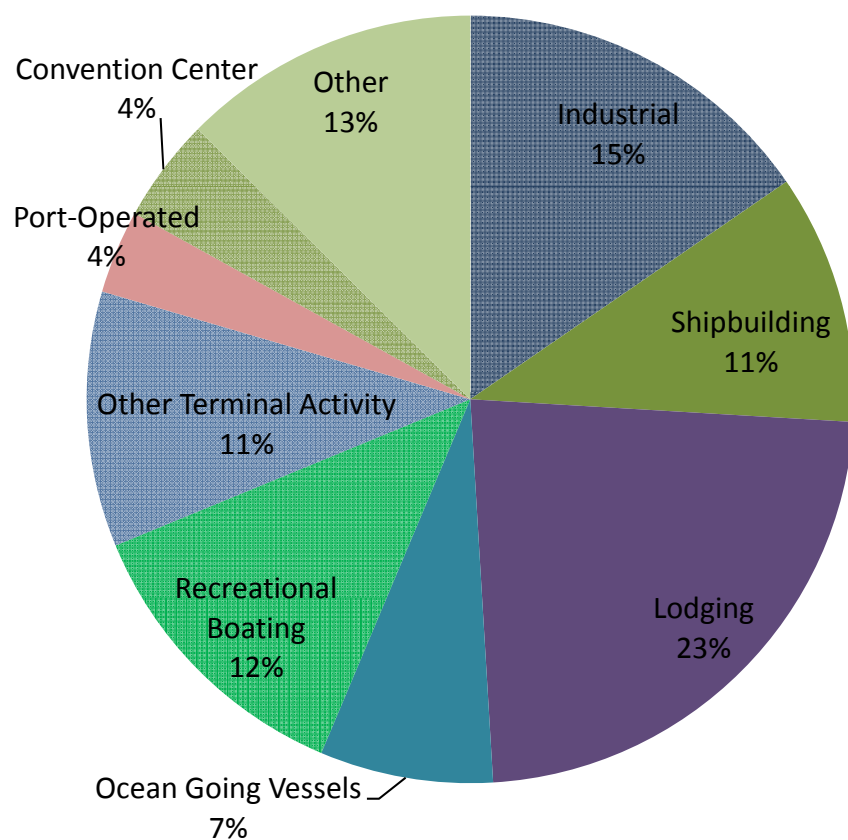


Other	
Restaurant (Standalone)	2.6%
Marinas	2.6%
Rental Car	1.3%
Yacht Club	1.0%
Boatyards	0.5%
Warehouse/Storage (Standalone)	0.2%
Retail (Standalone)	0.2%
RV Park	0.2%
Office (Standalone)	0.2%
Commercial Sportfishing	0.2%
Golf Course	0.1%
Museums	0.1%
Petroleum	0.1%
Sportfishing	0.05%
Land Transportation	0.01%
Other Terminal Activity	
Heavy Duty Vehicles	2.0%
Buildings/Onroad Transportation	1.9%
Commercial Harbor Craft	1.4%
Cargo Handling Equipment	0.3%
Cruise Terminal Transportation	0.3%
Locomotive	0.2%

Figure ES-2

Future (2020) GHG Emissions by Activity

855,489 metric tons CO₂e

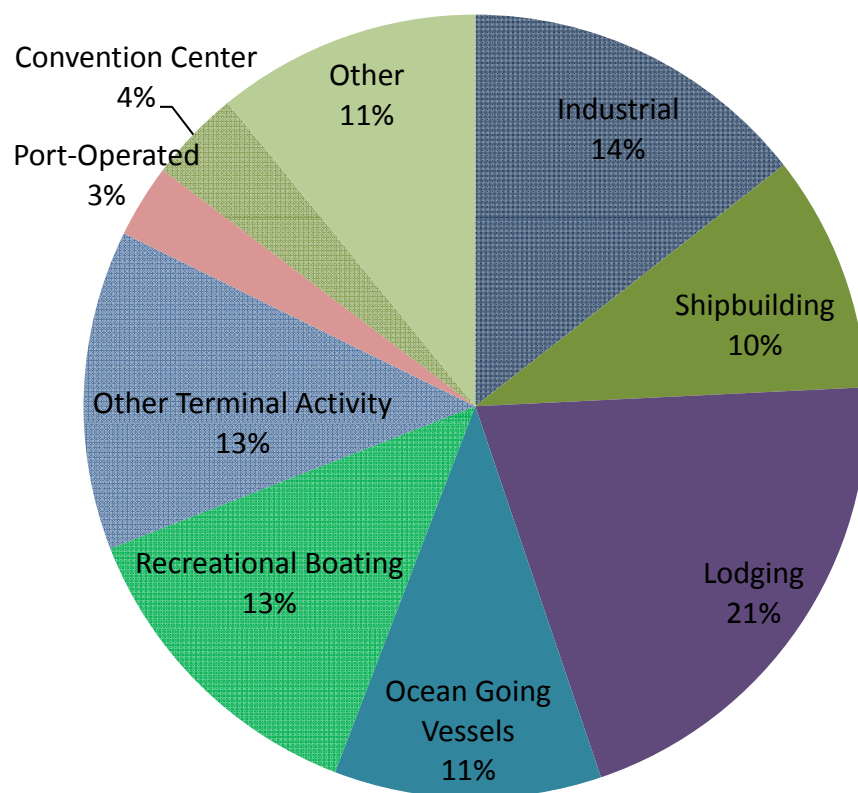


Other	
Restaurant (Standalone)	3.6%
Marinas	3.5%
Rental Car	1.9%
Yacht Club	1.4%
Boatyards	0.6%
Retail (Standalone)	0.3%
Warehouse/Storage (Standalone)	0.3%
RV Park	0.2%
Commercial Sportfishing	0.2%
Golf Course	0.2%
Museums	0.1%
Office (Standalone)	0.1%
Petroleum	0.1%
Sportfishing	0.1%
Fire Station (CVBMP)	0.02%
Land Transportation	0.02%
Classrooms	0.01%
Other Terminal Activity	
Heavy Duty Vehicles	4.4%
Buildings/Onroad Transportation	2.5%
Commercial Harbor Craft	2.3%
Cargo Handling Equipment	0.7%
Locomotive	0.5%
Cruise Terminal Transportation	0.4%

Figure ES-2

Future (2035) GHG Emissions by Activity

907,177 metric tons CO₂e

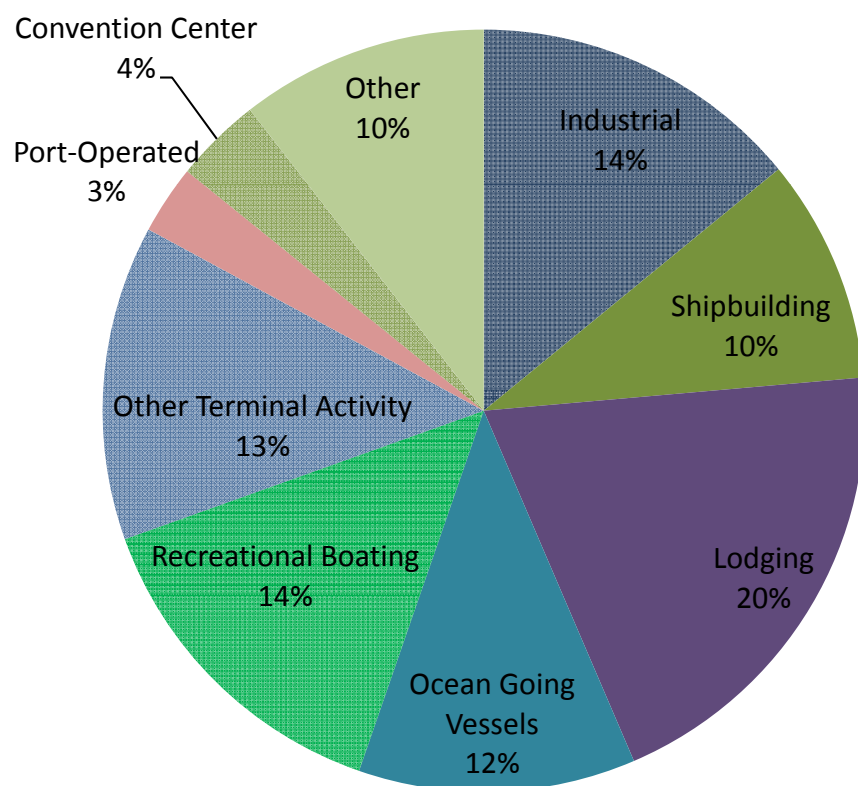


Other	
Restaurant (Standalone)	3.1%
Marinas	3.0%
Rental Car	1.7%
Yacht Club	1.2%
Boatyards	0.5%
Warehouse/Storage (Standalone)	0.2%
Retail (Standalone)	0.2%
RV Park	0.2%
Commercial Sportfishing	0.2%
Golf Course	0.2%
Museums	0.1%
Office (Standalone)	0.1%
Petroleum	0.1%
Sportfishing	0.1%
Fire Station (CVBMP)	0.01%
Land Transportation	0.01%
Classrooms	0.01%
Other Terminal Activity	
Heavy Duty Vehicles	6.3%
Commercial Harbor Craft	2.4%
Buildings/Onroad Transportation	2.2%
Cargo Handling Equipment	1.0%
Locomotive	0.7%
Cruise Terminal Transportation	0.6%

Figure ES-2

Future (2050) GHG Emissions by Activity

929,629 metric tons CO₂e



Other	
Restaurant (Standalone)	3.0%
Marinas	2.9%
Rental Car	1.6%
Yacht Club	1.1%
Boatyards	0.5%
Warehouse/Storage (Standalone)	0.2%
Retail (Standalone)	0.2%
RV Park	0.2%
Commercial Sportfishing	0.2%
Golf Course	0.2%
Museums	0.1%
Office (Standalone)	0.1%
Petroleum	0.1%
Sportfishing	0.1%
Fire Station (CVBMP)	0.01%
Land Transportation	0.01%
Classrooms	0.01%
Other Terminal Activity	
Heavy Duty Vehicles	6.4%
Commercial Harbor Craft	2.4%
Buildings/Onroad Transportation	2.1%
Cargo Handling Equipment	1.0%
Locomotive	0.7%
Cruise Terminal Transportation	0.7%

Figure ES-2

Table ES-1
GHG Inventory Summary by Sector
San Diego Unified Port District

Sector ^a	2006	2020 BAU ^{b,d}	2020 ^{c,d}	2035 ^{c,e}	2050 ^{c,f}
	(metric tons CO ₂ e/yr)				
Energy	309,414	361,744	300,376	300,376	300,376
Water & Wastewater	13,166	14,630	10,406	10,406	10,406
On-Road Transportation	314,870	410,069	317,708	310,506	310,646
Off-Road Transportation	172,222	232,819	206,559	265,449	287,761
Waste	16,757	20,439	20,439	20,439	20,439
Total Emissions	826,429	1,039,700	855,489	907,177	929,629
% Increase Compared to Baseline (2006)	--	26%	4%	10%	12%

Notes:

a. GHG emissions from the following sources are included for Port operations, maritime operations, and other Port tenants.

- Energy = electricity and stationary combustion (natural gas and diesel) sources
- Water & Wastewater = electricity needed to supply, convey, treat, and distribute both indoor and outdoor water use
- On-Road Transportation = combustion of fuel for commute, customer, vendor, or otherwise generated on-road vehicle activity
- Off-Road Transportation = combustion of fuel in off-road transportation activities (e.g. off-road equipment activity, ocean going vessels, and recreational boating)
- Waste = decomposition of municipal solid waste generated (these emissions occur offsite at the landfill).

b. The 2020 Business As Usual (BAU) inventory does not account for reductions due to currently approved regulations.

c. The following currently approved regulations are accounted for in the 2020, 2035, and 2050 projected inventories:

- Renewables Portfolio Standards (RPS)
- Pavley Vehicle Standards
- Low Carbon Fuel Standard (LCFS)
- Heavy Duty (Tractor-Trailer) GHG Regulation
- Ocean Going Vessels (OGV) Fuel Switch Regulation
- Shore Power for Ocean Going Vessels

d. The 2020 projected inventories account for the following growth assumptions:

- Future anticipated land use development projects that are projected to be built or implemented within the Port's jurisdiction by 2020
- Cargo growth, assuming 3% growth annually from 2006 to 2020, per the San Diego Unified Port District Maritime Business Plan
- Cruise growth, assuming 10% growth from 2006 to 2020, per Port of San Diego data.

e. The 2035 projected inventory accounts for the following growth assumptions:

- Future anticipated land use development projects that are projected to be built or implemented within the Port's jurisdiction by 2020
- Cargo growth, assuming 32% growth from 2020 to 2030 and then 3% growth annually through 2035, per the San Diego Unified Port District Maritime Business Plan
- Cruise growth, assuming 81% growth from 2020 to 2035, per the San Diego Unified Port District Cruise Market Update.

f. The 2050 projected inventory accounts for the following growth assumptions:

- Future anticipated land use development projects that are projected to be built or implemented within the Port's jurisdiction by 2020
- Cargo growth, assuming 3% growth annually from 2035 through 2050 and capped at terminal capacities, per the San Diego Unified Port District Maritime Business Plan
- Cruise growth, assuming 16% growth from 2035 to 2050, per the San Diego Unified Port District Cruise Market Update.

Abbreviations:

BAU - Business As Usual
CO₂e - carbon dioxide
GHG - greenhouse gas
yr - year

Table ES-2
GHG Inventory Summary by Activity
San Diego Unified Port District

Category	Tenant Type	2006	2020 BAU ^c	2020 ^d	2035 ^d	2050 ^d
		(metric tons CO ₂ e/yr)				
Port Operations	--	37,164	38,930	30,044	27,411	27,097
Maritime Operations ^a	Ocean Going Vessels	55,162	72,786	62,365	100,018	109,280
	Recreational Boating	80,441	118,252	106,391	120,247	132,252
	Other Terminal Activity	89,242	109,859	92,000	119,751	124,213
Other Port Tenants ^b	Industrial	137,426	138,258	131,725	130,960	130,869
	Shipbuilding	123,725	123,545	90,187	88,776	88,608
	Lodging	137,429	249,852	197,750	186,684	185,365
	Other	165,840	188,217	145,025	133,331	131,945
Total		826,429	1,039,700	855,489	907,177	929,629

Notes:

a. Maritime operations include GHG emissions from ocean going vessels (OGVs), recreational boating, and other terminal activity such as cargo handling equipment, commercial harbor craft, locomotives, heavy duty vehicles (for transport of goods to/from OGVs), cruise terminal transportation, and terminal tenants.

Maritime growth assumptions account for future anticipated land use development projects that are projected to be built or implemented within the Port's jurisdiction by 2020 as well as the following cargo and cruise growth assumptions:

- Cargo growth, assuming 3% growth annually from 2006 to 2020; 32% growth from 2020 to 2030 and then 3% growth annually through 2035; and 3% growth annually from 2035 through 2050 and capped at terminal capacities, per the San Diego Unified Port District Maritime Business Plan
- Cruise growth, assuming 10% growth from 2006 to 2020; 81% growth from 2020 to 2035; and 16% growth from 2035 to 2050, per Port of San Diego data and the San Diego Unified Port District Cruise Market Update.

Related cargo and cruise activities (such as cargo handling equipment) were assumed to grow accordingly.

b. Other port tenants includes GHG emissions from industrial tenants such as food manufacturing facilities and lumber yards; shipbuilding tenants; commercial tenants such as lodging, retail, office; and other tenants such as yacht clubs, marinas, and sport fishing.

Future year inventories (2020 BAU, 2020, 2035, and 2050) account for growth due to future anticipated land use development projects that are projected to be built or implemented within the Port's jurisdiction by 2020.

c. The 2020 Business As Usual (BAU) inventory does not account for reductions due to currently approved regulations.

d. The following currently approved regulations are accounted for in the 2020, 2035, and 2050 projected inventories:

- Renewables Portfolio Standards (RPS)
- Pavley Vehicle Standards
- Low Carbon Fuel Standard (LCFS)
- Heavy Duty (Tractor-Trailer) GHG Regulation
- Ocean Going Vessels (OGV) Fuel Switch Regulation
- Shore Power for Ocean Going Vessels

Abbreviations:

BAU - Business as Usual

CO₂e - carbon dioxide equivalent

GHG - greenhouse gas

yr - year

**Table ES-3
Map for Inventory Tables
San Diego Unified Port District**

Sector	Input Tables ¹	Emission Factors Tables ²	Inventory Tables ³				
			2006	2020 BAU	2020	2035	2050
Energy							
- Electricity and Natural Gas	Part of Inventory Tables	EF-1, EF-2	A-1, A-2	B-1, B-2	C-1, C-2	D-1, D-2	E-1, E-2
- Stationary Combustion	Part of Inventory Tables	EF-3	A-3, A-4	B-3, B-4	C-3, C-4	D-3, D-4	E-3, E-4
Water & Wastewater	IN-1, IN-2, IN-3	Coverted into kilowatt hours consumed: EF-1	A-5, A-6	B-5, B-6	C-5, C-6	D-5, D-6	E-5, E-6
On-road Transportation							
- Vehicle mile traveled (VMT)/Trip Based	IN-4, IN-5	EF-4	A-7	B-7	C-7	D-7	E-7
- Fuel Based	Part of Inventory Tables	EF-5	A-8	B-8	C-8	D-8	E-8
Off-road Transportation	Part of Inventory Tables	EF-6	A-9	B-9	C-9	D-9	E-9
Waste	IN-1, IN-6, IN-7, IN-8, IN-9	N/A	A-10	B-10	C-10	D-10	E-10
Maritime Emission Inventory	N/A	N/A	A-11	B-11	C-11	D-11	E-11

Notes:

1. Input Tables present specifics of select data used within the inventory tables, such as water usage rates, trip generation rates, and solid waste composition data.
2. Emission Factor tables present the CO₂, CH₄, and/or N₂O emission factors used for each inventory year.
3. Inventory tables combine the input tables and emission factor tables to calculate annual CO₂e emissions.

Abbreviations:

BAU - Business as Usual

CO₂ - carbon dioxideCO₂e - carbon dioxide equivalentCH₄ - methane

EF - Emission Factor

IN - Input

N/A - Not Applicable

N₂O - nitrous oxide

VMT - Vehicle Mile Traveled

Table IN-1
Square Foot per Employee Data¹
San Diego Unified Port District

Land Use Category	SF/employee
Regional Retail	704
Other Retail/Svc.	325
Downtown Office Space ²	249
Suburban Office Space ²	288
Hotel/Motel	1,152
R & D/Flex Space	466
Light Manufacturing	558
Heavy Manufacturing ³	724
Warehouse	979
Government Offices	206
Restaurant ³	388

Notes:

1. Land Use Category and square footage per employee data were taken from a Southern California Association of Governments 2001 *Employment Density Study Summary Report* (SCAG 2001), Table II-B. Data for Orange County was used when available, otherwise Regional Data was used.
2. Square footage data for Downtown and Suburban Office Space is from a Builders and Owners Management Association (BOMA) 1988 Survey for San Diego County; *Land Use Density Conversion Factors for the Long-Range Corridor Study, San Bernadino and Riverside Counties*.
3. Square footage data for Restaurants and Heavy Manufacturing is from a 1986 SCAG Study, *Employment and Parking in Suburban Business Parks* (Urban Land Use Institute).

Abbreviations:

BOMA - Builders and Owners Management Association
SANDAG - San Diego Association of Governments
SCAG - Southern California Association of Governments
SF - square feet

Sources:

Southern California Association of Governments (SCAG). 2001. *Employment Density Study Summary Report*. October 31. Available Online:
http://www.scag.ca.gov/pdfs/Employment_Density_Study.pdf

Table IN-2
Indoor and Outdoor Water Use by Land Use Category
San Diego Unified Port District

Land Use Categories		Unit	Indoor Water Use	Outdoor Water Use	Total Water Use	Reference
			(gallons/unit/yr)			
Residential ¹	Mobile Home Park	dwelling unit	65,154	41,075	106,229	1, 2a
Educational ^{2,3}	Elementary School	student	2,424	6,234	8,658	2b
Recreational	Golf Course	acre	0	1,191,481	1,191,481	2b
	Quality Restaurant	employee	56,048	3,578	59,625	2b
	High turnover (sit down restaurant)	employee	56,048	3,578	59,625	2b
	Hotel	occupied room	38,434.5	4,270.5	42,705	2b
Retail	Strip Mall	employee	21,204	12,996	34,200	2b
	Gasoline/Service Station	employee	21,204	12,996	34,200	2b
Commercial	General Office Building	employee	17,717	10,859	28,575	2b
	Government Office Building	employee	18,972	11,628	30,600	2b
Industrial	Unrefrigerated Warehouse	employee	797,340	0	797,340	2c
	Refrigerated Warehouse	employee	797,340	0	797,340	2c
	General Light Industry	employee	797,340	0	797,340	2c
	General Heavy Industry	employee	797,340	0	797,340	2c
	Manufacturing	employee	797,340	0	797,340	2c

Notes:

1. There is no residential land use on Port property. The mobile home land use type was used to estimate the trip rate for an RV Park.
2. There are no schools on Port property. The elementary school land use type was used to estimate the trip rate for classrooms embedded in commercial centers.
3. Educational land uses are assumed to have the same indoor/outdoor water breakdown as general office buildings.

Abbreviations:

yr - year

References:

1. US Census Bureau. 2000 Census. Table QT-H1: General Housing Characteristics 2000. Available online at: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>. The number of occupied housing units was used.
2. Gleick, P.H.; Haasz, D.; Henges-Jeck, C.; Srinivasan, V.; Cushing, K.K.; Mann, A. 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California. Published by the Pacific Institute for Studies in Development, Environment, and Security. Available online at: http://www.pacinst.org/reports/urban_usage/
 - a. Executive Summary, Table ES-1
 - b. Appendix E
 - c. Appendix F

Table IN-3
Water Energy Intensity Factors
San Diego Unified Port District

Energy Usage Type	Southern California	
	Indoor Uses (kWh/MG)	Outdoor Uses (kWh/MG)
Water Supply and Conveyance	9,727	9,727
Water Treatment	111	111
Water Distribution	1,272	1,272
Wastewater Treatment	1,911	0
Regional Total	13,022	11,111

Abbreviations:

CEC - California Energy Commission

kWh - Kilowatt-hours

MG - million gallons of water

Source:

California Energy Commission (CEC). 2006. Refining Estimates of Water-Related Energy Use in California. PIER Final Project Report. Prepared by Navigant Consulting, Inc. CEC-500-2006-118. Available online at: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>

Table IN-4
Trip Generation Rates
San Diego Unified Port District

Land Use	Study Land Use	Vehicle Trip Rate ^{1,2}	Units	Reference
Retail	Specialty Retail Center/Strip Commercial	40	trips/1,000 SF	1
Restaurant	Restaurant: High Turnover (sit-down)	130	trips/1,000 SF	1
	Restaurant: Quality	100	trips/1,000 SF	1
Office	Standard Commercial Office	20	trips/1,000 SF	2
	Government Office (Civic Center)	30	trips/1,000 SF	1
Hotel	Hotel (w/convention facilities/restaurant)	10	trips/occupied room	1
Museums	Library	50	trips/1,000 SF	1
Classrooms ³	Elementary School	39	trips/1,000 SF	1
Gas Station with food mart	Gasoline Station with food mart	865	trips/station	1
Golf Course	Golf Course	8	trips/acre	1
Marinas	Marinas	4	trips/berth	1
RV Park ⁴	Mobile Home	5	trips/dwelling unit	1
Open Space	Park: Developed	50	trips/acre	1
Industrial	Manufacturing/Assembly	50	trips/acre	1
Warehouse	Warehousing	5	trips/1,000 SF	1

Notes:

1. Represents the total number of trips (one-way trips) that are generated by a site with the given land use.
2. Data is representative of weekday trip generation rates.
3. There are no schools on Port property. The elementary school land use type was used to estimate the trip rate for classrooms embedded in commercial centers.
4. There is no residential land use on Port property. The mobile home land use type was used to estimate the trip rate for an RV Park.

Abbreviations:

SANDAG - San Diego Association of Governments
SF - square feet

References:

1. San Diego Municipal Code. May 2003. Land Development Code, Trip Generation Manual. Table 1. Available online at: <http://www.sandiego.gov/planning/pdf/tripmanual.pdf>
2. SANDAG. April 2002. (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region. Available online at: http://www.sandag.org/uploads/publicationid/publicationid_1140_5044.pdf

Table IN-5
On Road Transportation Trip Length
San Diego Unified Port District

Land Use	SANDAG Study Land Use	Trip Length ¹ (miles)
Retail	Commercial Shops	4.3
Restaurant	Restaurant	4.7
Office	Office	8.8
	Government Office	6
Hotel	Lodging	7.6
Museums	Library	3.9
Classrooms ²	Elementary School	3.4
Petroleum	Gasoline with Food Mart	2.8
Golf Course	Golf Course	6.3
Marinas	Marinas	6.3
RV Park ³	Residential	7.9
Open Space	Parks	5.4
Industrial/Warehouse	Industrial Plant	11.7

Notes:

1. Trip lengths are the average weighted trip length for all one-way trips to and from the designated land use (including trips designated for waste transportation).
2. There are no schools on Port property. The elementary school land use type was used to estimate the trip length for classrooms embedded in commercial centers.
3. There is no residential land use on Port property. The residential land use type was used to estimate the trip length for an RV Park.

Abbreviations:

SANDAG - San Diego Association of Governments

Source:

SANDAG. April 2002. (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region. Available online at: http://www.sandag.org/uploads/publicationid/publicationid_1140_5044.pdf

Table IN-6
Degradable Organic Carbon in Different MSW Components
San Diego Unified Port District

Waste Component	Default DOC content in % of wet waste	Default DOC content in % of dry waste
Paper/cardboard	40	44
Textiles	24	30
Food waste	15	38
Wood	43	50
Garden and Park waste	20	49

Abbreviations:

DOC - Degradable Organic Carbon

IPCC - Intergovernmental Panel on Climate Change

MSW - Municipal Solid Waste

Source:

IPCC. 2006. Guidelines For National Greenhouse Gas Inventories. Volume 5, Chapter 2.

Available online at: [http://www.ipcc-](http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_2_Ch2_Waste_Data.pdf)

[nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_2_Ch2_Waste_Data.pdf](http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_2_Ch2_Waste_Data.pdf)

Table IN-7
Decomposable Anaerobic Fraction Per Waste Type
San Diego Unified Port District

Waste Type	DANF	Source	Waste Category	Average DANF ¹
Newspaper	15.0%	USEPA	Paper/cardboard	42.75%
Office Paper	87.4%	USEPA		
Corrugated Boxes	44.3%	USEPA		
Coated Paper	24.3%	USEPA		
Food	86.5%	USEPA	Food waste	86.50%
Grass	32.5%	USEPA	Garden and Park waste	27.87%
Leaves	27.9%	USEPA		
Branches	23.2%	USEPA		
Lumber	23.3%	CEC	Wood	23.30%
Textiles	50.0%	IPCC	Textiles	50.00%

Notes:

1. Where multiple waste types fall into a given waste category, an average of the DANF for the various waste types is calculated.

Abbreviations:

CARB - California Air Resources Board

CEC - California Energy Commission

DANF - Decomposable Anaerobic Fraction

IPCC - Intergovernmental Panel on Climate Change

USEPA - United States Environmental Protection Agency

Source:

California Air Resources Board. 2010. Local Government Operations Protocol For the quantification and reporting of greenhouse gas emissions inventories. Version 1.1. May. Available online at:
http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf

Table IN-8
Solid Waste Disposal and Waste Profile Statistics by Land Use
San Diego Unified Port District

Land Use	Reference	Waste Disposal	Unit	Waste Profile										
				Paper	Glass	Metal	Plastic	Electronics	Organics	Construction and Demolition	Household Hazardous	Special Waste	Mixed Residue	Total
Large Office Buildings	2	1,866	lb/ 1,000 square feet	50.3%	1.8%	1.6%	12.5%	0.1%	24.4%	8.3%	0.2%	0.9%	0.0%	100%
Fast Food Restaurant	2	4262	lb/ employee	33.0%	0.6%	1.6%	11.6%	0.0%	52.5%	0.6%	0.0%	0.0%	0.0%	100%
Full-Service Restaurant	2	4403	lb/ employee	17.3%	2.7%	2.8%	7.3%	0.1%	66.5%	1.8%	0.0%	1.5%	0.0%	100%
Large Hotels	2	3903	lb/ employee	32.3%	4.7%	3.8%	9.7%	0.4%	44.2%	4.8%	0.1%	0.0%	0.0%	100%
Retail, Other Stores	2	1719	lb/ employee	31.8%	6.2%	8.7%	14.4%	0.7%	17.5%	15.0%	0.1%	5.4%	0.2%	100%
Services - Other Misc.	1	1800	lb/ employee	33.2%	2.5%	14.5%	10.1%	NA	30.3%	4.8%	0.5%	3.7%	0.5%	100%
Retail Trade - Automotive Dealers & Service Stations	1	1200	lb/ employee	33.9%	3.9%	13.2%	10.4%	NA	13.5%	14.9%	0.2%	9.5%	0.4%	100%
Services - Hotels/Lodging	1	4200	lb/ employee	37.1%	9.8%	3.2%	10.4%	NA	37.1%	1.2%	0.0%	0.4%	0.7%	100%
Trucking & Warehousing	1	3800	lb/ employee	34.9%	2.8%	12.4%	6.4%	NA	12.2%	23.7%	0.9%	6.5%	0.3%	100%
Transportation - Other	1	2600	lb/ employee	44.6%	4.2%	6.4%	12.7%	NA	13.2%	16.6%	0.1%	0.2%	2.2%	100%
Manufacturing - Industrial / Machinery	1	400	lb/ employee	36.9%	1.4%	15.9%	13.7%	NA	12.8%	12.2%	0.8%	5.6%	0.7%	100%
Manufacturing - Food / Kindred	1	3200	lb/ employee	36.3%	1.2%	5.4%	18.8%	NA	28.6%	7.9%	0.0%	1.7%	0.2%	100%
Manufacturing - Lumber & Wood Products	1	6200	lb/ employee	16.3%	1.5%	10.1%	3.0%	NA	22.3%	44.1%	0.4%	1.8%	0.6%	100%

Notes:

1. Large Office building is considered as having greater than 30,000 sq ft of office space. This was assumed to be representative of all office space, as there was no data provided for smaller office buildings.

Abbreviations:

lb - pound

NA - waste type not included in waste profile

References:

1. California Integrated Waste Management Board. 1999. Statewide Waste Characterization Study Results and Final Report. December. Tables 13, 20, 22, 31, 32, 35, 37, 38, 41 and Section 3.3.2. Available online at: <http://www.calrecycle.ca.gov/publications/LocalAsst/34000009.pdf>

2. California Integrated Waste Management Board. 2006. Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups. Contractor's Report to the Board. June. Tables 2, 3, 4, 8, 12 and Table 16. Available online at: <http://www.calrecycle.ca.gov/publications/Disposal/34106006.pdf>

Table IN-9
Waste Density Data
San Diego Unified Port District

Industry Group	Average Pounds per Cubic Yard	Reference
Full-Service Restaurants	132	2
Fast-Food Restaurants	100	2
Large Hotel	82	2
Retail, Other Stores	67	2
Large Office Buildings	84	2
Services - Other Misc.	89.5	1
Retail Trade - Auto Dealers & Svc. Stations	83.5	1
Services - Hotels / Lodging	97.1	1
Trucking & Warehousing	94.6	1
Transportation - Other	73.4	1
Manufacturing - Food / Kindred	73.5	1
Manufacturing - Lumber & Wood Products	134.2	1
Manufacturing - Industrial / Machinery	69	1

References:

1. California Integrated Waste Management Board. 1999. Statewide Waste Characterization Study Results and Final Report. Table 12. December. Available online at: <http://www.calrecycle.ca.gov/publications/LocalAsst/34000009.pdf>

2. California Integrated Waste Management Board. 2006. Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups. Contractor's Report to the Board. June. Table 19. Available online at: <http://www.calrecycle.ca.gov/publications/Disposal/34106006.pdf>

Table EF-1
Emission Factors for Electricity and Natural Gas
San Diego Unified Port District

Energy Source	Scenario	Pollutant	Emission Factor [lb/unit]	Unit	GWP ⁴	Conversion Factor [lb CO ₂ e/Unit]
Electricity	2006 Emission Factor / 2020 BAU ¹	CO ₂	7.81E+02	MWh	1	782.07
		CH ₄	6.70E-03		21	
		N ₂ O	3.70E-03		310	
	2020/2035/2050 Emission Factor ²	CO ₂	5.53E+02		1	556.29
		CH ₄	3.02E-02		21	
		N ₂ O	8.10E-03		310	
Natural Gas ³	-	CO ₂	1.17E+01	therm	1	11.73
		CH ₄	1.10E-03		21	
		N ₂ O	2.20E-05		310	

Notes:

- CO₂ emission factor for electricity is reflective of SDG&E for the year 2006, obtained from the California Climate Action Registry (CCAR) Database. CH₄ and N₂O emission factors for electricity are from CCAR General Reporting Protocol (GRP) V 3.1, Table E.3 *Methane and Nitrous Oxide Electricity Emission Factors by State, Calendar Years 1990-2007*; designated for historical reporting purposes.
- CO₂ emission factor for electricity has been adjusted to account for the 33% Renewables Portfolio Standard required of electricity providers by 2020. See subsequent tables for calculation details. CH₄ and N₂O emission factors for electricity are from CCAR GRP V 3.1, Table C.2 *Carbon Dioxide, Methane and Nitrous Oxide Electricity Emission Factors by eGRID Subregion*, eGRID Subregion CAMX (WECC California); designated for current reporting purposes. The 2020 emission factor is assumed to be representative of the 2035 and 2050 emission factors.
- CO₂ Emission factor for natural gas obtained from CCAR Reporting Protocol v 3.1, Table C.7. CH₄ and N₂O emission factors for natural gas are from CCAR Reporting Protocol v 3.1 Table C.8, land use designation 'Commercial/Institutional'. The CCAR Reporting Protocol does not present natural gas emission factors for historical reporting, so baseline (2006) and future (2020 BAU/2020/2035/2050) emission factors are assumed to be the same.
- Global warming potentials (GWPs) for CO₂, CH₄, and N₂O are from CCAR Reporting Protocol v 3.1, Table C.1. GWPs were taken from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (SAR), as these are still used by international convention and the U.S.

Abbreviations:

BAU - Business As Usual
 CCAR - California Climate Action Registry
 CO₂ - carbon dioxide
 CO₂e - carbon dioxide equivalent
 CH₄ - methane
 GRP - General Reporting Protocol
 GWP - global warming potential
 IPCC - Intergovernmental Panel on Climate Change
 MWh - megawatt-hour
 lb - pound
 N₂O - nitrous oxide
 SAR - Second Assessment Report
 SDG&E - San Diego Gas and Electric
 RPS - Renewables Portfolio Standard

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at:
http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
 California Climate Action Registry. Database: San Diego Gas and Electric Company 2006-2008 PUP Report. Available at:
<http://www.climateregistry.org/CARROT/public/reports.aspx>

Table EF-2
Energy Delivery from Renewable and Non-renewable Sources
San Diego Unified Port District

	2006	2007	2008	Average	Units
Total Energy Delivery¹	19,108,166	20,365,663	20,417,664	--	MWh
from Renewables ^{1,2}	1,195,258	1,180,118	1,269,048	--	MWh
from Non-Renewables ¹	17,912,909	19,185,545	19,148,616	--	MWh
% of Total Energy from Renewables ²	6%	6%	6%	--	--
% of Total Energy From Non-Renewables	94%	94%	94%	--	--
Total CO₂ Emissions¹	6,767,326	7,448,108	6,844,550	--	metric tons CO ₂
Emission Factors					
CO ₂ Emissions per Total Energy Delivered ³	780.79	806.27	739.05	--	lb CO ₂ /MWh delivered
CO ₂ Emissions per Total Non-Renewable Energy ⁴	832.88	855.87	788.03	--	lb CO ₂ /MWh delivered
2020 RPS (33%) ⁵	558.0	573.4	528.0	553.1	lb CO ₂ /MWh delivered

Notes:

1. Total energy delivery and total CO₂ emissions are provided in SDG&E's Power/Utility Protocol (PUP) Reports.
2. Renewable energy delivered is the sum of biogenic, geothermal and other renewable generations in PUP reports.
3. The emissions metric presented here is calculated based on the total CO₂ emissions divided by the total energy delivered.
4. The emissions metric presented here is calculated based on the total CO₂ emissions divided by the energy delivered from non-renewable sources.
5. The emission factor presented here is for the 2020 Renewable Portfolio Standard (RPS) scenario. The RPS requires utility providers to produce 33% of their electricity from renewable sources in 2020. The estimate provided here and in the PUP reports issued by SDG&E assume that renewable energy sources do not result in any CQ emissions. This is not necessarily true for biogas- and biomass-sourced energy but some consider these sources to be "carbon neutral." Therefore, the 2020 RPS emission factor is calculated by multiplying the CO₂ Emissions per Total Non-Renewable Energy by 67%.

Abbreviations:

CO₂ - carbon dioxide
 lb - pound
 MWh - Megawatt-hour
 SDG&E - San Diego Gas and Electric
 PUP - Power/Utility Protocol
 RPS - Renewables Portfolio Standard

Sources:

California Climate Action Registry. Database: San Diego Gas and Electric Company 2006-2008 PUP Report. Available at:
<http://www.climateregistry.org/CARROT/public/reports.aspx>
 California Public Utilities Commission. Order Instituting Rulemaking Regarding Implementation and Administration of the Renewables Portfolio Standard Program. May 2011. Available online at: http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/134980.pdf

Table EF-3
Emission Factors for Stationary Combustion
San Diego Unified Port District

Energy Source	Pollutant	Emission Factor [lb/unit]	Unit	GWP ³	Conversion Factor [lb CO ₂ e/Unit]
Natural Gas ¹	CO ₂	11.698	therm	1	11.71
	CH ₄	0.00022		21	
	N ₂ O	0.00002		310	
Diesel ²	CO ₂	22.38	gallon	1	22.46
	CH ₄	0.0009		21	
	N ₂ O	0.0002		310	

Notes:

1. CO₂ emission factor for natural gas obtained from CCAR Reporting Protocol v 3.1, Table C.7. CH₄ and N₂O emission factors for natural gas combustion are from CCAR Reporting Protocol v 3.1 Table C.8, land use designation 'Manufacturing/Construction'. The CCAR Reporting Protocol does not present natural gas emission factors for historical reporting, so baseline (2006) and future (2020 BAU/2020/2035/2050) emission factors are assumed to be the same.
2. CO₂ emission factor for diesel stationary combustions obtained from CCAR Reporting Protocol v 3.1, Table C.7. CH₄ and N₂O emission factors for diesel stationary combustion are from CCAR Reporting Protocol v 3.1 Table C.9, land use designation 'Manufacturing/Construction'.
3. Global warming potentials (GWPs) for CO₂, CH₄, and N₂O are from CCAR Reporting Protocol v 3.1, Table C.1. GWPs were taken from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (SAR), as these are still used by international convention and the U.S.

Abbreviations:

BAU - Business As Usual
 CCAR - California Climate Action Registry
 CO₂ - carbon dioxide
 CO₂e - carbon dioxide equivalent
 CH₄ - methane
 GWP - global warming potential
 IPCC - Intergovernmental Panel on Climate Change
 lb - pound
 N₂O - nitrous oxide
 SAR - Second Assessment Report

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at:
http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table EF-4
On-Road VMT/Trip Based Transportation Emission Factors
San Diego Unified Port District

Year	Fleet	Emission Factors	
		Running ¹ (g CO ₂ /VMT)	Starting/Idling ² (g CO ₂ /trip)
2006	Fleetwide ³	500	85
	Other Bus	1,062	41
	HHD	1,767	1,261
2020 BAU	Fleetwide ³	495	82
	Other Bus	1,295	29
	HHD	1,813	1,644
2020 ⁴	Fleetwide ³	378	64
	Other Bus	1,166	26
	HHD	1,520	1,479
2035 ⁴	Fleetwide ³	337	55
	Other Bus	1,219	22
	HHD	1,525	1,672
2050 ^{4,5}	Fleetwide ³	332	54
	Other Bus	1,221	22
	HHD	1,525	1,702

Notes:

1. Running emission factors are calculated from EMFAC by dividing the total CO₂ running emissions by the total vehicle miles traveled in San Diego County for calendar years 2006, 2020, 2035, and 2040 (assumed to be representative of 2050). EMFAC default distributions and profiles were used for San Diego County (e.g. vehicle class distribution, temperature profile, etc.).

2. Starting emission factors are calculated from EMFAC by dividing the total CO₂ starting and idling emissions by the total vehicle trips in San Diego County for calendar years 2006, 2020, 2035, and 2040 (assumed to be representative of 2050). EMFAC default distributions and profiles were used for San Diego County (e.g. vehicle class distribution, temperature profile, etc.).

3. The fleet wide emission factor conservatively includes other, urban, and school buses as part of the vehicle fleet.

4. Running and starting emission factors for calendar years 2020, 2035, and 2050 account for the reduction due to Pavley vehicle standards for light duty vehicles (vehicle classes LDA, LDT1, LDT2, and MDV), based on the ARB postprocessor (CARB 2010). Pavley standards for year 2016 are assumed to apply to all future model years. Vehicle emission factors for future years (2020/2035/2050) also account for the Low Carbon Fuel Standard (LCFS), which assumes a 10% reduction in carbon intensity by year 2020. The 2020 LCFS goal is assumed to stay constant through 2050. LCFS is included in this analysis, recognizing that it is currently being challenged. The Heavy-Duty (Tractor-Trailer) Greenhouse Gas Regulation is also incorporated into the vehicle emission factors for future years (2020/2035/2050). Similar to LCFS, the Heavy-Duty (Tractor-Trailer) 2020 projected reduction is assumed to remain constant through 2050.

5. 2050 emission factors are calculated based on EMFAC for calendar year 2040, the latest year calculated by EMFAC.

Abbreviations:

CARB - California Air Resources Board
CO₂ - carbon dioxide
EMFAC - Emission FACtor model
g - gram
HHD - Heavy-heavy duty (33,001-60,000 lbs)
LCFS - Low Carbon Fuel Standard
LDA - passenger cars
LDT1 - light-duty trucks 1 (0-3,750 lbs)
LDT2 - light-duty trucks 2 (3,751-5,750 lbs)
MDV - medium-duty trucks (5,751-8,500 lbs)
VMT - vehicle mile traveled

Sources:

California Air Resources Board (CARB). 2007. Emission FACtor Model (EMFAC). Available here: http://www.arb.ca.gov/msei/onroad/latest_version.htm
CARB. 2010. Pavley 1 and Low Carbon Fuel Standard Postprocessor Version 1.0. Available here: <http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>
CARB. Assembly Bill No. 1493 ("Pavley"). July 2002. Available online at: <http://www.arb.ca.gov/cc/ccms/documents/ab1493.pdf>
CARB. Heavy-Duty (Tractor-Trailer) Greenhouse Gas Regulation. Available here: <http://www.arb.ca.gov/cc/hdghg/hdghg.htm>
Low Carbon Fuel Standard. 2009. Final Regulation Order. Available online at: <http://www.arb.ca.gov/regact/2009/lcfs09/lcfscombofinal.pdf>

Table EF-5
On-Road Fuel Based Transportation Emission Factors
San Diego Unified Port District

Fuel Type	Scenario	Pollutant	Emission Factor [lbs/unit]	Unit	GWP ¹	Conversion Factor [lb CO ₂ e/Unit]
Diesel ¹	2006 / 2020 BAU	CO ₂	22.38	gallon	-	23.55
		CO ₂ e	23.55			
	2020 (Fleet wide)	CO ₂	16.91			17.80
		CO ₂ e	17.80			
	2035 (Fleet wide)	CO ₂	15.06			15.85
		CO ₂ e	15.85			
	2050 (Fleet wide)	CO ₂	14.84			15.62
		CO ₂ e	15.62			
	2006 / 2020 BAU	CO ₂	19.42			20.44
		CO ₂ e	20.44			
Gasoline ²	2020 (Passenger)	CO ₂	14.13	gallon	-	14.88
		CO ₂ e	14.88			
	2020 (Bus/Trolley)	CO ₂	17.48			18.40
		CO ₂ e	18.40			
	2020 (Fleet wide)	CO ₂	14.67			15.45
		CO ₂ e	15.45			
	2035 (Passenger)	CO ₂	12.38			13.03
		CO ₂ e	13.03			
	2035 (Bus/Trolley)	CO ₂	17.48			18.40
		CO ₂ e	18.40			
	2035 (Fleet wide)	CO ₂	13.07			13.76
		CO ₂ e	13.76			
	2050 (Passenger)	CO ₂	12.21			12.85
		CO ₂ e	12.85			
	2050 (Bus/Trolley)	CO ₂	17.48			18.40
		CO ₂ e	18.40			
	2050 (Fleet wide)	CO ₂	12.88			13.56
		CO ₂ e	13.56			
LPG ³	-	CO ₂	12.76	gallon	1	13.87
		CH ₄	0.00148		21	
		N ₂ O	0.00347		310	

Notes:

1. CO₂ emission factor for mobile diesel combustion obtained from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1, Table C.3. CO₂e=CO₂/0.95: The United States Environmental Protection Agency (USEPA) recommends assuming that CH₄, N₂O, and HFCs are 5% of emissions on a CO₂e basis. 2020, 2035, and 2050 emission factors were scaled by the ratio of the target year over 2006 fleet wide VMT based emission factors to account for Pavley, the Low Carbon Fuel Standard (LCFS), and the Heavy-Duty (Tractor-Trailer) Greenhouse Gas Regulation. LCFS applies to transportation fuels including diesel sold, supplied or offered for sale in California. LCFS is included in this analysis, recognizing that it is currently being challenged.

2. CO₂ emission factor for mobile gasoline combustion obtained from CCAR Reporting Protocol v 3.1, Table C.3. CO₂e=CO₂/0.95: The United States Environmental Protection Agency (USEPA) recommends assuming that CH₄, N₂O, and HFCs are 5% of emissions on a CO₂e basis. 2020, 2035, and 2050 emission factors were scaled by the ratio of the target year over 2006 VMT based emission factors to account for Pavley, the Low Carbon Fuel Standard (LCFS), and/or the Heavy-Duty (Tractor-Trailer) Greenhouse Gas Regulation, depending on the end use of the emission factor (passenger, bus/trolley, or fleet wide). LCFS applies to transportation fuels including California reformulated gasoline sold, supplied or offered for sale in California. LCFS is included in this analysis, recognizing that it is currently being challenged.

3. CO₂ emission factor for mobile Liquefied Petroleum Gas (LPG) combustion obtained from CCAR Reporting Protocol v 3.1, Table C.3. CH₄ and N₂O emission factors for mobile LPG combustion are from CCAR Reporting Protocol v 3.1 Table C.5, taking the average of light and heavy duty vehicles. LPG is exempt from the Low Carbon Fuel Standard, therefore the 2020, 2035, and 2050 emission factors are equivalent to the 2006/2020 BAU emission factor.

4. Global warming potentials (GWPs) for CO₂, CH₄, and N₂O are from CCAR Reporting Protocol v 3.1, Table C.1. GWPs were taken from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (SAR), as these are still used by international convention and the U.S.

Abbreviations:

CARB - California Air Resources Board
 CCAR - California Climate Action Registry
 CO₂ - carbon dioxide
 CO₂e - carbon dioxide equivalent
 CH₄ - methane
 GWP - global warming potential
 IPCC - Intergovernmental Panel on Climate Change
 lb - pound
 LCFS - Low Carbon Fuel Standard
 LPG - liquefied petroleum gas
 N₂O - nitrous oxide
 SAR - Second Assessment Report
 USEPA - United States Environmental Protection Agency
 VMT - vehicle miles traveled

Sources:

California Air Resources Board (CARB). 2010. Pavley 1 and Low Carbon Fuel Standard Postprocessor Version 1.0. Available online at: <http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>

CARB. Assembly Bill No. 1493 ("Pavley"). July 2002. Available online at: <http://www.arb.ca.gov/cc/docs/documents/ab1493.pdf>

CARB. Heavy-Duty (Tractor-Trailer) Greenhouse Gas Regulation. Available online at: <http://www.arb.ca.gov/cc/hdghg/hdghg.htm>

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available online at: http://www.climateregistry.org/resources/docs/protocols/grp_3.1_january2009.pdf

Low Carbon Fuel Standard. Final Regulation Order. Available online at: <http://www.arb.ca.gov/regact/2009/lcfs09/lcfscombofinal.pdf>

Table EF-6
Mobile Off-road Emission Factors
San Diego Unified Port District

Fuel Type	Scenario	Pollutant	Emission Factor [lb/unit]	Unit	GWP ⁶	Conversion Factor [lb CO ₂ e/Unit]
Diesel ¹	2006 / 2020 BAU	CO ₂	22.38	gallon	1	22.58
		CH ₄	0.0013		21	
		N ₂ O	0.0006		310	
	2020/2035/2050	CO ₂	20.1392		1	20.34
		CH ₄	0.0013		21	
		N ₂ O	0.0006		310	
Gasoline (Ships & Boats) ²	2006 / 2020 BAU	CO ₂	19.42	gallon	1	19.60
		CH ₄	0.0014		21	
		N ₂ O	0.0005		310	
	2020/2035/2050	CO ₂	17.4805		1	17.66
		CH ₄	0.0014		21	
		N ₂ O	0.0005		310	
Gasoline (Utility) ³	2006 / 2020 BAU	CO ₂	19.42	gallon	1	19.60
		CH ₄	0.0011		21	
		N ₂ O	0.0005		310	
	2020/2035/2050	CO ₂	17.4805		1	17.65
		CH ₄	0.0011		21	
		N ₂ O	0.0005		310	
Propane ⁴	-	CO ₂	12.65	gallon	1	12.94
		CH ₄	0.0002		21	
		N ₂ O	0.0009		310	
LPG ⁵	-	CO ₂	12.76	gallon	1	13.05
		CH ₄	0.0002		21	
		N ₂ O	0.0009		310	

Notes:

1. CO₂ emission factor for mobile diesel combustion obtained from CCAR Reporting Protocol v 3.1, Table C.3. CH₄ and N₂O emission factors for mobile diesel combustion are from CCAR Reporting Protocol v 3.1 Table C.6, 'Other Large Utility (Diesel)' designation. A 10% reduction was applied to the CO₂ emission factors for 2020, 2035, and 2050 due to the Low Carbon Fuel Standard, which applies to transportation fuels including California diesel fuel sold, supplied or offered for sale in California. LCFS is included in this analysis, recognizing that it is currently being challenged.

2. CO₂ emission factor for mobile gasoline combustion obtained from CCAR Reporting Protocol v 3.1, Table C.3. CH₄ and N₂O emission factors for mobile gasoline combustion are from CCAR Reporting Protocol v 3.1 Table C.6, 'Ships & Boats' designation. A 10% reduction was applied to the CO₂ emission factors for 2020, 2035, and 2050 due to the Low Carbon Fuel Standard, which applies to transportation fuels including California reformulated gasoline sold, supplied or offered for sale in California. LCFS is included in this analysis, recognizing that it is currently being challenged.

3. CO₂ emission factor for mobile gasoline combustion obtained from CCAR Reporting Protocol v 3.1, Table C.3. CH₄ and N₂O emission factors for mobile gasoline combustion are from CCAR Reporting Protocol v 3.1 Table C.6, 'Other Small Utility (Gasoline)' designation. A 10% reduction was applied to the CO₂ emission factors for 2020, 2035, and 2050 due to the Low Carbon Fuel Standard, which applies to transportation fuels including California reformulated gasoline sold, supplied or offered for sale in California. LCFS is included in this analysis, recognizing that it is currently being challenged.

4. CO₂ emission factor for mobile propane combustion obtained from CCAR Reporting Protocol v 3.1, Table C.3. CH₄ and N₂O emission factors for mobile propane combustion are from CCAR Reporting Protocol v 3.1 Table C.6, 'All Non-Highway/Construction Vehicles' designation. Propane is exempt from the Low Carbon Fuel Standard, therefore the 2020, 2035, and 2050 emission factors are equivalent to the 2006/2020 BAU emission factor.

5. CO₂ emission factor for mobile Liquefied Petroleum Gas (LPG) combustion obtained from CCAR Reporting Protocol v 3.1, Table C.3. CH₄ and N₂O emission factors for mobile propane combustion are from CCAR Reporting Protocol v 3.1 Table C.6, 'All Non-Highway/Construction Vehicles' designation. LPG is exempt from the Low Carbon Fuel Standard, therefore the 2020, 2035, and 2050 emission factors are equivalent to the 2006/2020 BAU emission factor.

6. Global warming potentials (GWPs) for CO₂, CH₄, and N₂O are from CCAR Reporting Protocol v 3.1, Table C.1. GWPs were taken from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (SAR), as these are still used by international convention and the U.S.

Abbreviations:

CCAR - California Climate Action Registry
CO₂ - carbon dioxide
CO₂e - carbon dioxide equivalent
CH₄ - methane
GWP - global warming potential
IPCC - Intergovernmental Panel on Climate Change
lb - pound
LCFS - Low Carbon Fuel Standard
LPG - liquefied petroleum gas
SAR - Second Assessment Report

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at:
http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table A-1
Baseline (2006) Inventory
Electricity and Natural Gas Emissions - Land Use Based Metric
San Diego Unified Port District

Tenant Type	Building Type ¹	CEUS Category Mapping	Activity Data ¹ (SF)	Electricity Energy Intensity ² (kWh/SF/yr)	Natural Gas Energy Intensity ² (therm/SF/yr)	Electricity Usage (kWh)	Natural Gas Usage (therm)	Electricity Emission Factor ³ (lb CO ₂ e/MWh)	Natural Gas Emission Factor ³ (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Retail	66,517	15.49	0.024	1,030,350	1,624	782.07	11.73	374
Office	-	All Office	53,677	16.40	0.242	880,272	12,998			381
Restaurant	-	Restaurant	248,587	43.73	1.768	10,870,521	439,542			6,194
Lodging	Rooms	Lodging	5,082,371	16.10	0.617	81,845,616	3,138,318			45,729
	Restaurant	Restaurant	262,100	43.73	1.768	11,461,457	463,437			6,531
	Meeting Area	All Office	537,900	16.40	0.242	8,821,190	130,250			3,822
	Retail	Retail	13,450	15.49	0.024	208,340	328			76
	Office	All Office	17,081	16.40	0.242	280,117	4,136			121
Warehouse/Storage	-	Unrefrigerated Warehouse	115,968	4.54	0.021	526,412	2,416			200
Museums	Museum	Miscellaneous	1,931	9.72	0.124	18,767	240			8
	Office	All Office	200	16.40	0.242	3,280	48			1
	Retail	Retail	11,200	15.49	0.024	173,488	273			63
	Restaurant	Restaurant	7,000	43.73	1.768	306,105	12,377			174
Rental Car	Retail	Retail	52,332	15.49	0.024	810,621	1,278			294
	Car Wash	Unrefrigerated Warehouse	6,108	4.54	-	27,726	-			10
Yacht Clubs	General Building	Miscellaneous	97,848	-	0.124	-	12,139			65
	Restaurant	Restaurant	5,404	43.73	1.768	236,316	9,555			135
Marinas	General Building	Miscellaneous	146,783	-	0.124	-	18,210			97
	Office	All Office	32,120	16.40	0.242	526,746	7,778			228
	Retail	Retail	4,163	15.49	0.024	64,485	102			23
	Restaurant	Restaurant	19,679	43.73	1.768	860,549	34,796			490
Sport fishing	General Building	Miscellaneous	6,991	-	0.124	-	867			5
	Restaurant	Restaurant	1,409	43.73	1.768	61,615	2,491			35
Commercial Sport fishing	General Building	Miscellaneous	17,403	-	0.124	-	2,159			11
	Office	All Office	13,152	16.40	0.242	215,680	3,185			93
	Retail	Retail	4,100	15.49	0.024	63,509	100			23
Excursions	Retail	Retail	1,241	15.49	0.024	19,223	30			7
	Restaurant	Restaurant	1,600	43.73	1.768	69,967	2,829			40
Petroleum	Office	All Office	2,055	16.40	0.242	33,701	498			15
	Retail	Retail	15,338	15.49	0.024	237,585	374			86
Boatyards	Office	All Office	16,886	16.40	0.242	276,919	4,089			120
	Retail	Retail	1,000	15.49	0.024	15,490	24			6
Terminal Tenants	Office	All Office	266,100	16.40	0.242	4,363,857	64,435			1,891
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	433,143	4.54	0.021	1,966,160	9,024			745
	Car Wash	Unrefrigerated Warehouse	8,701	4.54	-	39,496	-			14
	Refrigerated Warehouse	Refrigerated Warehouse	288,000	35.31	0.071	10,169,519	20,502			3,717
	Office	All Office	38,913	16.40	0.242	638,138	9,422			276
Industrial	Miscellaneous	Miscellaneous	301,021	9.72	0.124	2,925,528	37,345			1,236
	Refrigerated Warehouse	Refrigerated Warehouse	60,311	35.31	0.071	2,129,614	4,293			778
	SBPP ⁴	Miscellaneous	45,369	9.72	0.124	440,927	5,628			186
Other Commercial ⁵	-	-	-	-	-	836,197	28,372			448
Total										74,565

Notes:

1. Since CEUS data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was provided for each building type by the Port of San Diego.
2. Electricity and natural gas intensities are derived from the 2006 California Commercial End-Use Survey (CEUS), performed by Itron under contract to the California Energy Commission (CEC). Energy usage rates are based on 2002 consumption data. ENVIRON used data for San Diego Gas & Electric, Zone 13, which is the sector in which the Port of San Diego is located.
3. See previous tables for the calculation of the electricity and natural gas emission factors.
4. The South Bay Power Plant was not included in the inventory but is provided here for informational purposes.
5. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative CEUS data.

Abbreviations:

CEC - California Energy Commission
CEUS - California Commercial End-Use Survey
CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MWh - megawatt-hour
SBPP - South Bay Power Plant
SF - square feet
yr - year

Sources:

California Energy Commission. 2006. California Commercial End-Use Survey. Prepared by Itron Inc. Available at: <http://www.energy.ca.gov/ceus/>

Table A-2
Baseline (2006) Inventory
Electricity and Natural Gas Emissions - Other Metrics
San Diego Unified Port District

Tenant Type	Energy Source	Activity Data ¹ (Unit)	Unit	Energy Intensity	Units	Energy Usage	Units	Electricity Emission Factor ² (lb CO ₂ e/MWh)	Natural Gas Emission Factor ² (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
Port ³	Electricity	-				10,051,718	kWh	782.07	11.73	3,566
	Natural Gas	-				61,524	therm			327
Yacht Clubs ⁴	Electricity	2,229	Slips	3,125	(kWh/unit/yr)	6,965,625	kWh			2,471
Marinas ⁴	Electricity	5,160	Slips			16,125,000				5,720
Sport fishing ⁴	Electricity	75	Slips			234,375				83
Commercial Sport fishing ⁴	Electricity	125	Slips			390,625				139
Boatyards ⁵	Electricity	1,392,465	SF			2.44				(kWh/unit/yr)
	Natural Gas	1,392,465	SF	0.002	(therm/unit/yr)	2,432	therm			13
Shipbuilding ⁶	Electricity	4,639,831	SF	56.76	(kWh/unit/yr)	263,367,151	kWh			93,428
	Natural Gas	4,639,831	SF	0.001	(therm/unit/yr)	5,265	therm			28
Other Commercial ⁷	Electricity	-				20,026,871	kWh			7,104
	Natural Gas	-				215,003	therm			1,144
Other Industrial ⁸	Electricity	-				24,647,874	kWh			8,744
Total										123,970

Notes:

- Activity data was provided by the Port of San Diego.
- See previous tables for the calculation of the electricity and natural gas emission factors.
- Emissions due to Port electricity and natural gas use were derived from data provided by the Port of San Diego.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CO₂e - carbon dioxide equivalent
 kWh - kilowatt-hour
 lb - pound
 MWh - megawatt-hour
 SF - square feet
 yr - year

Table A-3
Baseline (2006) Inventory
Stationary Combustion (Natural Gas) Emissions
San Diego Unified Port District

Tenant Type	Fuel Use	Usage	Units	Emission Factors ¹ (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
CP Kelco ²	General Stationary Combustion, Cogeneration	-			95,833
South Bay Power Plant ²	Electricity Generation	-			628,773
Other Industrial ³	General Stationary Combustion	2,699,865	therms	11.71	14,340
Total					110,173

Notes:

1. Emission factors are from the CCAR Reporting Protocol v 3.1; see previous tables for details.
2. Emissions from CP Kelco and South Bay Power Plant (Dynegy Power Plant) were reported to CARB in 2008. These emissions are assumed to be representative of year 2006. The South Bay Power Plant was not included in the inventory but is provided here for informational purposes.
3. Other Industrial includes industrial tenants who did not report to CARB. Emissions were calculated based on data provided by the tenants.

Abbreviations

CARB - California Air Resources Board
 CCAR - California Climate Action Registry
 CO₂e - carbon dioxide equivalent
 lb - pound
 yr - year

Sources:

California Air Resources Board. Mandatory Greenhouse Gas Reporting. Available online at: http://arb.ca.gov/cc/reporting/ghg-rep/regulation/2010_regulation.htm
 California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available online at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table A-4
Baseline (2006) Inventory
Stationary Combustion (Diesel) Emissions
San Diego Unified Port District

Tenant Type	Fuel Use	Usage	Units	Emission Factors ¹ (lb CO ₂ e/unit)	Total Emissions (metric tons CO ₂ e/yr)
Port Events ²	General Stationary Combustion	324	gallons	22.46	3.3
Other Commercial ³	General Stationary Combustion	160	gallons		2
Other Industrial ⁴	General Stationary Combustion	68,934	gallons		702
Total					707

Notes:

1. Emission factors are from the CCAR Reporting Protocol v 3.1; see previous tables for details.
2. Diesel stationary combustion from Port events is solely from generators. Data was provided by the Port of San Diego.
3. Other Commercial includes commercial tenants with diesel stationary combustion. Emissions were calculated based on data provided by tenants.
4. Other Industrial includes industrial tenants with diesel stationary combustion. Emissions were calculated based on data provided by tenants.

Abbreviations

CCAR - California Climate Action Registry

CO₂e - carbon dioxide equivalent

lb - pound

yr - year

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at:
http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table A-5
Baseline (2006) Inventory
Emissions from Water Use - Land Use Based Metric
San Diego Unified Port District

Tenant Type	Building Type ¹	Land use Mapping	Activity Data ³ (Unit)	Unit	Indoor Water Usage Factor ⁴ (Gallons/Unit/yr)	Outdoor Water Usage Factor ² (Gallons/Unit/yr)	Indoor Water Usage (MG/yr)	Outdoor Water Usage (MG/yr)	Indoor Water Energy Intensity ⁵ (kWh/MG)	Outdoor Water Energy Intensity ¹ (kWh/MG)	Electricity Usage (kWh)	Electricity Emission Factor ⁶ (lb CO ₂ e/MWh)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Strip Mall	95	employee	21,204	12,996	2.01	1.23			39,949		14
Office	-	General Office Building	216	employee	17,717	10,859	3.83	2.35			75,892		27
Restaurant	-	High turnover (sit down restaurant)	641	employee	56,048	3,578	35.93	2.29			493,314		175
Lodging ⁵	Occupied Rooms	Hotel	4,793	occupied rooms	38,435	4,271	184.22	20.47			2,626,341		932
	Restaurant	Quality Restaurant	676	employee	56,048	3,578	37.89	2.42			520,250		185
	Meeting Area	General Office Building	2,161	employee	17,717	10,859	38.29	23.47			759,274		269
	Retail	Strip Mall	20	employee	21,204	12,996	0.42	0.26			8,410		3
	Office	General Office Building	69	employee	17,717	10,859	1.22	0.75			24,243		9
Warehouse/Storage		Unrefrigerated Warehouse	119	employee	797,340	0	94.88	0.00			1,235,572		438
	Museum	Government Office Building	10	employee	18,972	11,628	0.19	0.12			3,763		1
Museums	Office	General Office Building	1	employee	17,717	10,859	0.02	0.01			351		0.1
	Retail	Strip Mall	16	employee	21,204	12,996	0.34	0.21			6,728		2
	Restaurant	High turnover (sit down restaurant)	19	employee	56,048	3,578	1.06	0.07			14,622		5
Rental Car	Retail	Strip Mall	75	employee	21,204	12,996	1.59	0.97			31,539		11
Yacht Clubs	Restaurant	Quality Restaurant	14	employee	56,048	3,578	0.78	0.05			10,774		4
	Office	General Office Building	129	employee	17,717	10,859	2.29	1.40			45,325		16
Marinas	Retail	Strip Mall	6	employee	21,204	12,996	0.13	0.08			2,523		1
	Restaurant	High turnover (sit down restaurant)	51	employee	56,048	3,578	2.86	0.18	13,022	11,111	39,250	782.07	14
Sport fishing	Restaurant	High turnover (sit down restaurant)	4	employee	56,048	3,578	0.22	0.01			3,078		1
Commercial Sport fishing	Office	General Office Building	53	employee	17,717	10,859	0.94	0.58			18,622		7
	Retail	Strip Mall	6	employee	21,204	12,996	0.13	0.08			2,523		1
Excursions	Retail	Strip Mall	2	employee	21,204	12,996	0.04	0.03			841		0.3
	Restaurant	High turnover (sit down restaurant)	5	employee	56,048	3,578	0.28	0.02			3,848		1
Petroleum	Gas Station	Gasoline/Service Station	14	employee	21,204	12,996	0.30	0.18			5,887		2
	Office	General Office Building	9	employee	17,717	10,859	0.16	0.10			3,162		1
	Retail	Strip Mall	9	employee	21,204	12,996	0.19	0.12			3,785		1
Boatyards	Office	General Office Building	68	employee	17,717	10,859	1.20	0.74			23,892		8
	Retail	Strip Mall	2	employee	21,204	12,996	0.04	0.03			841		0.3
Terminal Tenants ⁶	Office	General Office Building	97	employee	17,717	10,859	1.72	1.05			34,081		12
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	157	employee	797,340	0	125.18	0			1,630,125		578
Shipbuilding	Heavy Industry	General Heavy Industry	1,649	employee	797,340	0	1,314.81	0			17,121,500		6,074
	Office	General Office Building	157	employee	17,717	10,859	2.78	1.70			55,162		20
Industrial	Light Industry	General Light Industry	500	employee	797,340	0	398.67	0			5,191,480		1,842
	Heavy Industry	General Heavy Industry	115	employee	797,340	0	91.69	0			1,194,040		424
	SBPP ⁷	General Heavy Industry	63	employee	797,340	0	49.96	0			650,642		231
Other Commercial ⁸			-				2.72	0.43			40,190.3		14
												Total	11,093

Notes:

1. Since water usage data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego. See previous tables for the conversion of square footage into number of employees.
2. ENVIRON used data from the Pacific Institute's "Waste Not Want Not" report and US Census Data to estimate the amount of water used at each land use type. See previous tables for details.
3. ENVIRON used energy intensities for indoor and outdoor water use for Southern California from California Energy Commission 2006 Report, *Refining Estimates of Water-Related Energy Use in California*. This includes energy used for water supply and conveyance, treatment, distribution, and wastewater treatment (for indoor water). See previous tables for details.
4. See previous tables for the calculation of the electricity emission factor.
5. The water use rate for lodging is per occupied room, therefore an average occupancy rate for year 2006 in San Diego County was used to estimate the number of occupied rooms. The average occupancy rate is from the San Diego Convention & Visitors Bureau.
6. Terminal tenants only include those who are not on the Port water meters. See later tables for the inclusion of Port water use.
7. The South Bay Power Plant was not included in the inventory but is provided here for informational purposes.
8. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative water usage rates.

Abbreviations

CEC - California Energy Commission
CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MG - million gallons of water
MWh - megawatt-hour
SBPP - South Bay Power Plant
yr - year

Sources:

California Energy Commission. 2006. *Refining Estimates of Water Related Energy Use in California*. CEC-500-2006-118. Available at: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>
Pacific Institute (Gleick, P.H.; Haasz, D.; Henges-Jeck, C.; Srinivasan, V.; Cushing, K.K.; Mann, A.) 2003. *Waste Not, Want Not: The Potential for Urban Water Conservation in California*. Available at: http://www.pacinst.org/reports/urban_usage/
San Diego Convention & Visitors Bureau. San Diego County Visitor Industry Summary for 2006. <http://www.sandiego.org/nav/visitors>
US Census Bureau. 2000 Census. Table QT-H1: General Housing Characteristics 2000. Available online at: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>

Table A-6
Baseline (2006) Inventory
Emissions from Water Use - Other Metrics
San Diego Unified Port District

Tenant Type	Activity Data ¹ (Unit)	Unit	Indoor Water Usage Factor (Gallons/Unit/yr)	Outdoor Water Usage Factor (Gallons/Unit/yr)	Indoor Water Usage (MG/yr)	Outdoor Water Usage (MG/yr)	Indoor Water Energy Intensity ² (kWh/MG)	Outdoor Water Energy Intensity ² (kWh/MG)	Electricity Usage (kWh)	Electricity Emission Factor ³ (lb CO ₂ e/MWh)	Total Emissions (metric tons CO ₂ e/yr)
Port ⁴	-				192	-	13,022	11,111	2,505,852	782.07	889
Boatyards ⁵	1,392,465	SF	36	-	49.9	-			650,258		231
Rental Car ⁶	687,150	cars	-	27	-	18.6			206,143		73
Yacht Clubs ⁷	2,229	Slips	-	969	-	2.2			23,992		9
Marinas ⁷	5,160	Slips				5.0			55,541		20
Sport fishing ⁷	75	Slips				0.1			807		0.3
Commercial Sport fishing ⁷	125	Slips				0.1			1,345		0.5
Terminal Tenant Car Wash ⁶	978,863	cars				-			27		-
Other Commercial ⁸	-				35	129.9			1,901,784		675
Other Industrial ⁹	-				16	-			202,287		72
Total											2,072

Notes:

- Activity data was provided by the Port of San Diego.
- ENVIRON used energy intensities for indoor and outdoor water use for Southern California from California Energy Commission 2006 Report, *Refining Estimates of Water-Related Energy Use in California*. This includes energy used for water supply and conveyance, treatment, distribution, and wastewater treatment (for indoor water). See previous tables for details.
- See previous tables for the calculation of the electricity emission factor.
- Port includes water use from Port owned and operated buildings, National City Marine Terminal (NCMT), Tenth Avenue Marine Terminal (TAMT) (with the exclusion of some tenants who are on their own water meter), and the Cruise Ship Terminal (CST).
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Water use from car washes was calculated based on a metric developed from participating representative tenants to calculate the number of cars washed annually. Average water use per car wash is from the International Car Wash Association; the mean value from conveyor car washes was used.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CEC - California Energy Commission
CO₂e - carbon dioxide equivalent
CST - Cruise Ship Terminal
kWh - kilowatt-hour
lb - pound
MG - million gallons of water
MWh - megawatt-hour
NCMT - National City Marine Terminal
SF - square feet
TAMT - Tenth Avenue Marine Terminal
yr - year

Source:

California Energy Commission. 2006. Refining Estimates of Water Related Energy Use in California. CEC-500-2006-118. Available at: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>

International Car Wash Association. *Water Use in the Professional Car Wash Industry*. 2002. Available online at: <http://www.carwash.org/operatorinformation/research/Pages/EnvironmentalReports.aspx>

Table A-7
Baseline (2006) Inventory
On-Road Transportation - VMT/Trip Based Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Trip Generation Mapping	Trip Length Mapping	Activity Data ³	units	Trip Generation Rate ²	units/day	Vehicle Trips per yr ⁵	Trip Length (miles) ⁴	Yearly VMT	Fleet wide Running Emission Factor ⁵ (g/VMT)	Fleet wide Starting/Adding Emission Factor ⁵ (g/trip)	Annual Emissions ⁵ (metric tons CO ₂ e/yr)
Retail	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	67	1,000 sq ft	40	trips/1,000 sq ft	971,153	4.3	4,175,956			2,287
Office	Office	Standard Commercial Office	Office	54	1,000 sq ft	20	trips/1,000 sq ft	391,845	8.8	3,448,236			1,851
Restaurant	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	249	1,000 sq ft	130	trips/1,000 sq ft	11,795,430	4.7	55,438,523			30,257
Lodging ⁷	Lodging	Hotel (w/convention facilities/restaurant)	Lodging	4,793	occupied rooms	10	trips/occupied room	17,494,768	7.6	132,960,233			71,596
Warehouse/Storage	Warehouse	Warehousing	Industrial Plant	116	1,000 sq ft	5	trips/1,000 sq ft	211,642	11.7	2,476,207			1,323
Museums	Museum	Government Office (Civic Center)	Government Office	2	1,000 sq ft	30	trips/1,000 sq ft	21,144	6	126,867			69
	Office	Standard Commercial Office	Office	0.2	1,000 sq ft	20	trips/1,000 sq ft	1,460	8.8	12,848			7
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	11	1,000 sq ft	40	trips/1,000 sq ft	163,520	4.3	703,136			385
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	7	1,000 sq ft	130	trips/1,000 sq ft	332,150	4.7	1,561,105			852
Yacht Club	Restaurant	Restaurant: Quality	Restaurant	5	1,000 sq ft	100	trips/1,000 sq ft	197,248	4.7	927,066			506
	Slips	Marinas	Marinas	2,229	slips	4	trips/berth	3,254,340	6.3	20,502,342			11,090
Marinas	Office	Standard Commercial Office	Office	32	1,000 sq ft	20	trips/1,000 sq ft	234,476	8.8	2,063,389			1,108
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	4	1,000 sq ft	40	trips/1,000 sq ft	60,780	4.3	261,353			143
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	20	1,000 sq ft	130	trips/1,000 sq ft	933,769	4.7	4,388,712			2,395
	Slips	Marinas	Marinas	5,160	slips	4	trips/berth	7,533,600	6.3	47,461,680			25,673
Sport fishing	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	1	1,000 sq ft	130	trips/1,000 sq ft	66,857	4.7	314,228			171
	Slips	Marinas	Marinas	75	slips	4	trips/berth	109,500	6.3	689,850			373
Commercial Sport fishing	Office	Standard Commercial Office	Office	13	1,000 sq ft	20	trips/1,000 sq ft	96,008	8.8	844,872	500.31	85.46	454
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	4	1,000 sq ft	40	trips/1,000 sq ft	59,860	4.3	257,398			141
	Slips	Marinas	Marinas	247	slips	4	trips/berth	360,620	6.3	2,271,906			1,229
Excursions	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	1	1,000 sq ft	40	trips/1,000 sq ft	18,119	4.3	77,910			43
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	2	1,000 sq ft	130	trips/1,000 sq ft	75,920	4.7	356,824			195
Petroleum	Office	Standard Commercial Office	Office	2	1,000 sq ft	20	trips/1,000 sq ft	15,002	8.8	132,013			71
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	6	1,000 sq ft	40	trips/1,000 sq ft	88,432	4.3	380,258			208
	Fueling Stations	Gasoline Station with food mart	Gasoline with Food Mart	2	stations	865	trips/station	631,731	2.8	1,768,846			988
Open Space	-	Park Developed	Parks	142	acres	50	trips/acre	2,598,800	5.4	14,033,520			7,624
Boatyards	Boatyard	Manufacturing/Assembly	Industrial Plant	32	acres	50	trips/acre	583,390	11.7	6,825,669			3,647
	Office	Standard Commercial Office	Office	17	1,000 sq ft	20	trips/1,000 sq ft	123,268	8.8	1,084,757			582
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	1	1,000 sq ft	40	trips/1,000 sq ft	14,600	4.3	62,780			34
Terminal Tenants	Office	Standard Commercial Office	Office	273	1,000 sq ft	20	trips/1,000 sq ft	1,990,615	8.8	17,517,413			9,404
	Unrefrigerated Warehouse	Warehousing	Industrial Plant	544	1,000 sq ft	5	trips/1,000 sq ft	993,587	11.7	11,624,963			6,212
	Refrigerated Warehouse	Warehousing	Industrial Plant	288	1,000 sq ft	5	trips/1,000 sq ft	525,600	11.7	6,149,520			3,286
Port Offices	-	Standard Commercial Office	Office	271	1,000 sq ft	20	trips/1,000 sq ft	1,976,739	8.8	17,395,302			9,339
Port Warehouses	-	Warehousing	Industrial Plant	972	1,000 sq ft	5	trips/1,000 sq ft	1,773,782	11.7	20,753,244			11,089
Shipbuilding	-	Manufacturing/Assembly	Industrial Plant	107	acres	50	trips/acre	1,943,915	11.7	22,743,800			12,153
Industrial Tenants	Office	Standard Commercial Office	Office	39	1,000 sq ft	20	trips/1,000 sq ft	284,061	8.8	2,499,739			1,342
	Refrigerated Warehouse	Warehousing	Industrial Plant	39	1,000 sq ft	5	trips/1,000 sq ft	71,015	11.7	830,879			444
	Other Tenants	Manufacturing/Assembly	Industrial Plant	64	acres	50	trips/acre	1,165,577	11.7	13,637,253			7,287
	SBPP ⁹	Manufacturing/Assembly	Industrial Plant	149	acres	50	trips/acre	2,718,264	11.7	31,803,686			16,994
Rental Car ¹⁰	-	-	-	-	-	-	-	280,320	15.2	4,259,637	1,062	41	4,776
Events ¹⁰	-	-	Parks	-	-	-	-	268,704	5.4	1,451,002	500	85	788
Other Commercial ¹¹	-	-	-	-	-	-	-	5,314,882	8.6	45,651,395			24,520
Total													255,942

Notes:

- Since trip data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego.
- The Trip Generation Rate represents the total number of trips (one-way trips) that are generated by a site with the given land use. Trip generation rates are from the San Diego Municipal Code, Land Development Code, Trip Generation Manual (May 2003) and the SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002). See previous tables for details.
- Annual vehicle trips are calculated assuming the weekday trip rate applies during the weekend (assuming 365 days per year of weekday travel rates).
- Trip lengths are from SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002) and represent average weighted trip lengths for all trips to and from the general land use site. See previous tables for details.
- The fleet wide running and starting emission factors are calculated from EMFAC2007 for San Diego County for year 2006. See previous tables for calculation details.
- CO₂e=CO₂/0.95: The United States Environmental Protection Agency (USEPA) recommends assuming that CH₄, N₂O, and HFCs are 5% of emissions on a CO₂e basis.
- The trip rate for lodging is per occupied room, therefore an average occupancy rate for year 2006 in San Diego County was used to estimate the number of occupied rooms. The average occupancy rate is from the San Diego Convention & Visitors Bureau.
- The South Bay Power Plant was not included in the inventory but is provided here for informational purposes.
- Rental car bus trips were calculated based on a metric developed from participating representative tenants. Emissions factors are for the EMFAC vehicle class 'Other Bus'.
- Event data, including attendees, was provided by the Port of San Diego. Each attendee was conservatively assumed to drive their own car to and from the event. Trip length data was assumed to be equal to that of parks, as all events are held in the parks.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative trip data.

Abbreviations:

CH₄ - methane
CO₂ - carbon dioxide
CO₂e - carbon dioxide equivalent
g - gram
HFC - hydrofluorocarbons
N₂O - nitrous oxide
SBPP - San Diego Association of Governments
sq ft - square feet
USEPA - United States Environmental Protection Agency
VMT - vehicle miles traveled
yr - year

Sources:

San Diego Convention & Visitors Bureau. San Diego County Visitor Industry Summary for 2006. <http://www.sandiego.org/nav/visitors>
San Diego Municipal Code, Land Development Code, Trip Generation Manual. May 2003. Available online at: <http://www.sandiego.gov/planning/pdf/tripmanual.pdf>
SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region. April 2002. Available online at: http://www.sandag.org/uploads/publicationid/publicationid_1140_5044.pdf

Table A-8
Baseline (2006) Inventory
On-Road Transportation - Fuel Based Emissions
San Diego Unified Port District

Tenant Type	Fuel	Activity Data ¹ (Unit)	Unit	Fuel Intensity (gal/unit/yr)	Fuel Usage (gallons)	Emission Factors ² (lb CO ₂ e/gallon)	Total Emissions (metric tons CO ₂ e/yr)
Port On-Road ³				-			978
Rental Car ⁴	Gasoline		-		1,558,314	20.44	14,451
Boatyards ⁵	Gasoline	1,392,465	SF	0.03	44,361	20.44	411
	Gasoline			0.060	279,603	20.44	2,593
Shipbuilding ⁶	Diesel	4,639,831	SF	0.047	216,209	23.55	2,310
	LPG			0.029	133,665	13.87	841
Other Commercial ⁷	Gasoline			-			19
	Propane			-			120
Other Industrial ⁸	Diesel			-			4,032
Total							25,755

Notes:

- Activity data was provided by the Port of San Diego.
- Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
- Emissions due to Port on-road transportation were derived from data provided by the Port of San Diego.
- Emissions from rental cars are scaled from the San Francisco Airport Climate Action Plan, based on passenger count statistics for year 2006 for San Diego Airport and San Francisco International Airport. There are a total of 16 rental car agencies at the San Diego Airport, 4 of which are within the Port's jurisdiction, therefore the total rental car emissions are scaled by (4/16).
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards. This was assumed to be separate from commute/customer/vendor trips, which are quantified under the VMT based on-road emissions.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage. This was assumed to be separate from commute/customer/vendor trips, which are quantified under the VMT based on-road emissions.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CCAR - California Climate Action Registry
CO₂e - carbon dioxide equivalent
gal - gallon
lb - pound
LPG - liquefied petroleum gas
SF - square feet
VMT - vehicle miles traveled
yr - year

Sources:

Bureau of Transportation Statistics. T-100 Segment data for Airport Flight Data. http://www.transtats.bts.gov/Data_Elements.aspx?Data=2. Accessed January, 2011.

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

San Francisco International Airport. 2010. SFO Climate Action Plan. Available online at: <http://www.flysfo.com/web/page/about/green/index.html>. Accessed February, 2011.

San Diego International Airport Rental Car Agencies. http://www.san.org/sdia/transportation/car_rental.aspx. Accessed August, 2011.

Table A-9
Baseline (2006) Inventory
Emissions from Off-road Equipment Use
San Diego Unified Port District

Tenant Type	Fuel	Activity Data ¹ (Unit)	Unit	Fuel Intensity (gal/unit/yr)	Fuel Usage (gallons)	Emission Factors ² (lb CO ₂ e/gallon)	Total Emissions (metric tons CO ₂ e/yr)
Port Off-road ³				-			591
Yacht Clubs ⁴	Gasoline	2,229	Slips	14	30,828	19.60	274
Marinas ⁴	Gasoline	5,160	Slips		71,366	19.60	635
Sport fishing ⁴	Gasoline	75	Slips		1,037	19.60	9
Commercial Sport fishing ⁴	Gasoline	247	Slips		3,416	19.60	30
Recreational Boating ⁵				-			80,145
Boatyards ⁶	Diesel	1,392,465	SF	0.041	57,670	22.58	591
	Propane			0.012	16,809	12.94	99
Shipbuilding ⁷	Diesel	4,639,831	SF	0.129	596,477	22.58	6,110
Lumber Yards ⁸	Diesel	954,603	SF	0.042	39,966	22.58	409
	LPG			0.013	12,174	13.05	72
Other Commercial ⁹	Gasoline		-		8,100	20	72
Other Industrial ¹⁰	Diesel		-				63
Total							89,101

Notes:

- Activity data was provided by the Port of San Diego.
- Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
- Emissions due to Port off-road transportation were derived from data provided by the Port of San Diego.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- OFFROAD2007 was run for San Diego County for year 2006. The total emissions were scaled by the % of boating days spent on the Ocean versus the Delta, SF Bay, and Inland Lakes for residents within the South Coast over years 2007-2008 (California Boater Survey, July 2011). This assumption, in effect, adjusts the San Diego County boat population and activity to reflect only those boats which are active off of the coastline of San Diego County. The fleet mix and boating habits within San Diego County are assumed to be similar to that surveyed in the South Coast. Total emissions from boating activity in the ocean (off the San Diego County coastline) were then adjusted by the portion of slip area present within the Port of San Diego versus the slip area present within the San Diego County coastline.
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Lumber yard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CARB - California Air Resources Board
 CCAR - California Climate Change Registry
 CO₂e - carbon dioxide equivalent
 gal - gallon
 lb - pound
 LCFS - Low Carbon Fuel Standard
 LPG - liquefied petroleum gas
 SF- square feet
 yr - year

Sources:

2007-2009 California Boater Survey. July 2011. Available online at: <http://www.coastal.ca.gov/ccbn/materialsforeducators.html>
 California Air Resources Board (CARB). 2006. Off-Road Emissions Inventory Program (OFFROAD2007). Available Online: <http://www.arb.ca.gov/msei/offroad/offroad.htm>
 California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table A-10
Baseline (2006) Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Retail, Other Stores	95	employees	1,719	lb/ employee	82	Paper/cardboard	32%	26	40%	43%	2	1	14	33	48
								Textiles	4%	4	24%	50%	0	0	1	3	
								Food waste	11%	9	15%	87%	1	0	4	9	
								Wood	13%	10	43%	23%	1	0	3	8	
								Garden and Park waste	2%	2	20%	28%	0	0	0	1	
Office	-	Large Office Buildings	54	1,000 square feet	1,866	lb/ 1,000 square feet	50	Paper/cardboard	50%	25	40%	43%	2	1	13	32	41
								Textiles	6%	3	24%	50%	0	0	1	3	
								Food waste	18%	9	15%	87%	1	0	4	9	
								Wood	4%	2	43%	23%	0	0	1	2	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Restaurant	-	Full-Service Restaurant	641	employees	4,403	lb/ employee	1,411	Paper/cardboard	17%	244	40%	43%	21	9	129	311	1110
								Textiles	0%	6	24%	50%	0	0	2	5	
								Food waste	66%	933	15%	87%	61	25	375	901	
								Wood	1%	8	43%	23%	0	0	3	6	
								Garden and Park waste	0%	1	20%	28%	0	0	0	1	
Hotel/Lodging	Hotel - Rooms	Large Hotels	4,412	employees	3,903	lb/ employee	8,610	Paper/cardboard	32%	2,781	40%	43%	238	98	1473	3540	6553
								Textiles	4%	301	24%	50%	18	7	112	269	
								Food waste	36%	3,134	15%	87%	203	84	1260	3027	
								Wood	4%	319	43%	23%	16	7	99	238	
								Garden and Park waste	4%	362	20%	28%	10	4	62	150	
	Restaurant	Full-Service Restaurant	676	employees	4,403	lb/ employee	1,488	Paper/cardboard	17%	257	40%	43%	22	9	136	328	1171
								Textiles	0%	6	24%	50%	0	0	2	5	
								Food waste	66%	984	15%	87%	64	26	395	950	
								Wood	1%	9	43%	23%	0	0	3	7	
								Garden and Park waste	0%	1	20%	28%	0	0	0	1	
	Meeting Area	Large Office Buildings	538	1,000 square feet	1,866	lb/ 1,000 square feet	502	Paper/cardboard	50%	252	40%	43%	22	9	134	321	410
								Textiles	6%	28	24%	50%	2	1	10	25	
								Food waste	18%	92	15%	87%	6	2	37	89	
								Wood	4%	21	43%	23%	1	0	7	16	
								Garden and Park waste	1%	3	20%	28%	0	0	1	1	
	Retail	Retail, Other Stores	20	employees	1,719	lb/ employee	17	Paper/cardboard	32%	5	40%	43%	0	0	3	7	10
								Textiles	4%	1	24%	50%	0	0	0	1	
								Food waste	11%	2	15%	87%	0	0	1	2	
								Wood	13%	2	43%	23%	0	0	1	2	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Office	Large Office Buildings	17	1,000 square feet	1,866	lb/ 1,000 square feet	16	Paper/cardboard	50%	8	40%	43%	1	0	4	10	13
								Textiles	0%	1	24%	50%	0	0	0	1	
								Food waste	18%	3	15%	87%	0	0	1	3	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Warehouse/Storage	-	Trucking & Warehousing	119	employees	3,800	lb/ employee	226	Paper/cardboard	35%	79	40%	43%	7	3	42	100	132
								Textiles	6%	13	24%	50%	1	0	5	12	
								Food waste	4%	9	15%	87%	1	0	4	9	
								Wood	14%	31	43%	23%	2	1	9	23	
								Garden and Park waste	2%	5	20%	28%	0	0	1	2	
Museums	Museum	Services - Other Misc.	10	employees	1,800	lb/ employee	9	Paper/cardboard	33%	3	40%	43%	0	0	2	4	6
								Textiles	11%	1	24%	50%	0	0	0	1	
								Food waste	13%	1	15%	87%	0	0	0	1	
								Wood	3%	0	43%	23%	0	0	0	0	
								Garden and Park waste	7%	1	20%	28%	0	0	0	0	
	Office	Large Office Buildings	0.20	1,000 square feet	1,866	lb/ 1,000 square feet	0	Paper/cardboard	50%	0	40%	43%	0	0	0	0	0
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	0	15%	87%	0	0	0	0	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	16	employees	1,719	lb/ employee	14	Paper/cardboard	32%	4	40%	43%	0	0	2	6	8
								Textiles	4%	1	24%	50%	0	0	0	1	
								Food waste	11%	2	15%	87%	0	0	1	1	
								Wood	13%	2	43%	23%	0	0	1	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	19	employees	4,403	lb/ employee	42	Paper/cardboard	17%	7	40%	43%	1	0	4	9	33
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	28	15%	87%	2	1	11	27	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
Rental Car ⁷	Retail	Retail, Other Stores	75	employees	1,719	lb/ employee	64	Paper/cardboard	32%	20	40%	43%	2	1	11	26	38
								Textiles	4%	3	24%	50%	0	0	1	2	
								Food waste	11%	7	15%	87%	0	0	3	7	
								Wood	13%	8	43%	23%	0	0	3	6	
								Garden and Park waste	2%	1	20%	28%	0	0	0	1	

Table A-10
Baseline (2006) Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Yacht Clubs ⁸	Restaurant	Full-Service Restaurant	14	employees	4,403	lb/ employee	31	Paper/cardboard	17%	5	40%	43%	0	0	3	7	24
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	20	15%	87%	1	1	8	20	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Services - Other Misc.	2,229	slips	556	lb/ slip	619	Paper/cardboard	33%	206	40%	43%	18	7	109	262	389
								Textiles	11%	66	24%	50%	4	2	24	59	
								Food waste	13%	78	15%	87%	5	2	31	75	
								Wood	3%	20	43%	23%	1	0	6	15	
								Garden and Park waste	7%	44	20%	28%	1	1	8	18	
Marinas ⁸	Office	Large Office Buildings	32	1,000 square feet	1,866	lb/ 1,000 square feet	30	Paper/cardboard	50%	15	40%	43%	1	1	8	19	24
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	5	15%	87%	0	0	2	5	
								Wood	4%	1	43%	23%	0	0	0	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	6	employees	1,719	lb/ employee	5	Paper/cardboard	32%	2	40%	43%	0	0	1	2	3
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	1	
								Wood	13%	1	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	51	employees	4,403	lb/ employee	112	Paper/cardboard	17%	19	40%	43%	2	1	10	25	88
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	74	15%	87%	5	2	30	72	
								Wood	1%	1	43%	23%	0	0	0	1	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Services - Other Misc.	5,160	slips	556	lb/ slip	1,433	Paper/cardboard	33%	476	40%	43%	41	17	252	606	900
								Textiles	11%	152	24%	50%	9	4	56	136	
								Food waste	13%	181	15%	87%	12	5	73	174	
								Wood	3%	46	43%	23%	2	1	14	34	
								Garden and Park waste	7%	102	20%	28%	3	1	18	42	
Sport fishing ⁹	Restaurant	Full-Service Restaurant	4	employees	4,403	lb/ employee	9	Paper/cardboard	17%	2	40%	43%	0	0	1	2	7
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	6	15%	87%	0	0	2	6	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Manufacturing - Food / Kindred	75	slips	1,692	lb/ slip	63	Paper/cardboard	36%	23	40%	43%	2	1	12	29	45
								Textiles	6%	4	24%	50%	0	0	1	3	
								Food waste	22%	14	15%	87%	1	0	6	14	
								Wood	7%	4	43%	23%	0	0	1	3	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Commercial Sport fishing ⁹	Office	Large Office Buildings	13	1,000 square feet	1,866	lb/ 1,000 square feet	12	Paper/cardboard	50%	6	40%	43%	1	0	3	8	10
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	18%	2	15%	87%	0	0	1	2	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	6	employees	1,719	lb/ employee	5	Paper/cardboard	32%	2	40%	43%	0	0	1	2	3
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	1	
								Wood	13%	1	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Slips	Manufacturing - Food / Kindred	247	slips	1,692	lb/ slip	209	Paper/cardboard	36%	76	40%	43%	6	3	40	97	148
								Textiles	6%	12	24%	50%	1	0	4	11	
								Food waste	22%	47	15%	87%	3	1	19	45	
								Wood	7%	14	43%	23%	1	0	4	10	
								Garden and Park waste	1%	1	20%	28%	0	0	0	0	
Excursions ⁷	Retail	Retail, Other Stores	2	employees	1,719	lb/ employee	2	Paper/cardboard	32%	1	40%	43%	0	0	0	1	1
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	0	15%	87%	0	0	0	0	
								Wood	13%	0	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	5	employees	4,403	lb/ employee	11	Paper/cardboard	17%	2	40%	43%	0	0	1	2	9
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	7	15%	87%	0	0	3	7	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Petroleum ⁷	Office	Large Office Buildings	2	1,000 square feet	1,866	lb/ 1,000 square feet	2	Paper/cardboard	50%	1	40%	43%	0	0	1	1	2
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	0	15%	87%	0	0	0	0	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	22	employees	1,719	lb/ employee	19	Paper/cardboard	32%	6	40%	43%	1	0	3	8	11
								Textiles	4%	1	24%	50%	0	0	0	1	
								Food waste	11%	2	15%	87%	0	0	1	2	
								Wood	13%	2	43%	23%	0	0	1	2	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	

Table A-10
Baseline (2006) Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Boatyards ¹⁰	Boatyards	Manufacturing - Industrial / Machinery	308	employees	400	lb/ employee	62	Paper/cardboard	37%	23	40%	43%	2	1	12	29	35
								Textiles	6%	4	24%	50%	0	0	1	3	
								Food waste	3%	2	15%	87%	0	0	1	2	
								Wood	9%	5	43%	23%	0	0	2	4	
								Garden and Park waste	4%	2	20%	28%	0	0	0	1	
	Office	Large Office Buildings	17	1,000 square feet	1,866	lb/ 1,000 square feet	16	Paper/cardboard	50%	8	40%	43%	1	0	4	10	13
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	18%	3	15%	87%	0	0	1	3	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	2	employees	1,719	lb/ employee	2	Paper/cardboard	32%	1	40%	43%	0	0	0	1	1
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	0	15%	87%	0	0	0	0	
								Wood	13%	0	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
Terminals	Office	Large Office Buildings	266	1,000 square feet	1,866	lb/ 1,000 square feet	248	Paper/cardboard	50%	125	40%	43%	11	4	66	159	203
								Textiles	6%	14	24%	50%	1	0	5	12	
								Food waste	18%	45	15%	87%	3	1	18	44	
								Wood	4%	10	43%	23%	1	0	3	8	
								Garden and Park waste	1%	1	20%	28%	0	0	0	1	
	Unrefrigerated Warehouse	Trucking & Warehousing	444	employees	3,800	lb/ employee	843	Paper/cardboard	35%	294	40%	43%	25	10	156	375	494
								Textiles	6%	50	24%	50%	3	1	18	44	
								Food waste	4%	34	15%	87%	2	1	14	33	
								Wood	14%	114	43%	23%	6	2	35	85	
								Garden and Park waste	2%	19	20%	28%	1	0	3	8	
	Refrigerated Warehouse	Trucking & Warehousing	295	employees	3,800	lb/ employee	561	Paper/cardboard	35%	196	40%	43%	17	7	104	249	328
								Textiles	6%	33	24%	50%	2	1	12	30	
								Food waste	4%	22	15%	87%	1	1	9	22	
								Wood	14%	76	43%	23%	4	2	23	56	
								Garden and Park waste	2%	13	20%	28%	0	0	2	5	
	Office/Unrefrigerated Warehouse/Cruise Ships	Services - Other Misc.	-	-	-	-	215	Paper/cardboard	33%	71	40%	43%	6	3	38	91	135
								Textiles	11%	23	24%	50%	1	1	8	20	
								Food waste	13%	27	15%	87%	2	1	11	26	
								Wood	3%	7	43%	23%	0	0	2	5	
								Garden and Park waste	7%	15	20%	28%	0	0	3	6	
Shipbuilding	-	Manufacturing - Industrial / Machinery	1,649	employees	400	lb/ employee	330	Paper/cardboard	37%	122	40%	43%	10	4	64	155	189
								Textiles	6%	20	24%	50%	1	0	7	18	
								Food waste	3%	10	15%	87%	1	0	4	10	
								Wood	9%	29	43%	23%	1	1	9	21	
								Garden and Park waste	4%	13	20%	28%	0	0	2	5	
	Office	Large Office Buildings	39	1,000 square feet	1,866	lb/ 1,000 square feet	36	Paper/cardboard	50%	18	40%	43%	2	1	10	23	30
								Textiles	6%	2	24%	50%	0	0	1	2	
								Food waste	18%	7	15%	87%	0	0	3	6	
								Wood	4%	2	43%	23%	0	0	0	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Industrial	General Industrial	Manufacturing - Industrial / Machinery	8	employees	400	lb/ employee	2	Paper/cardboard	37%	1	40%	43%	0	0	0	1	1
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	3%	0	15%	87%	0	0	0	0	
								Wood	9%	0	43%	23%	0	0	0	0	
								Garden and Park waste	4%	0	20%	28%	0	0	0	0	
	General Industrial - SBPP ¹	Manufacturing - Industrial / Machinery	63	employees	400	lb/ employee	13	Paper/cardboard	37%	5	40%	43%	0	0	2	6	7
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	3%	0	15%	87%	0	0	0	0	
								Wood	9%	1	43%	23%	0	0	0	1	
								Garden and Park waste	4%	0	20%	28%	0	0	0	0	
	Food Processing	Manufacturing - Food / Kindred	467	employees	3,200	lb/ slip	747	Paper/cardboard	36%	271	40%	43%	23	10	144	345	528
								Textiles	6%	43	24%	50%	3	1	16	38	
								Food waste	22%	167	15%	87%	11	4	67	162	
								Wood	7%	49	43%	23%	2	1	15	36	
								Garden and Park waste	1%	1	20%	28%	0	0	0	0	
Port	Lumber Yards	Manufacturing - Lumber & Wood Products	172	employees	6,200	lb/ employee	533	Paper/cardboard	16%	87	40%	43%	7	3	46	111	321
								Textiles	21%	109	24%	50%	7	3	41	98	
								Food waste	1%	7	15%	87%	0	0	3	7	
								Wood	35%	185	43%	23%	9	4	57	138	
								Garden and Park waste	1%	3	20%	28%	0	0	1	1	
	General Port Office	Large Office Buildings	50	1,000 square feet	8,050	lb/ 1,000 square feet	347	Paper/cardboard	50%	174	40%	43%	15	6	92	222	283
								Textiles	6%	19	24%	50%	1	0	7	17	
								Food waste	18%	63	15%	87%	4	2	26	61	
								Wood	4%	15	43%	23%	1	0	5	11	
								Garden and Park waste	1%	2	20%	28%	0	0	0	1	
	General Port Warehouse	Trucking & Warehousing	1,496	employees	3,800	lb/ employee	2,877	Paper/cardboard	35%	1,004	40%	43%	86	36	532	1278	1686
								Textiles	6%	170	24%	50%	10	4	63	152	
								Food waste	4%	115	15%	87%	7	3	46	111	
								Wood	14%	388	43%	23%	19	8	121	290	
								Garden and Park waste	2%	66	20%	28%	2	1	11	27	

Table A-10
Baseline (2006) Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Other Commercial ¹²	Restaurant	Full-Service Restaurant	40	employees	4403	lb/employee	88	Paper/cardboard	17%	15	40%	43%	1	1	8	19	69
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	58	15%	87%	4	2	23	56	
								Wood	1%	1	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	9	employees	1719	lb/employee	8	Paper/cardboard	32%	2	40%	43%	0	0	1	3	5
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	1	
								Wood	13%	1	43%	23%	0	0	0	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Office	Large Office Buildings	-	-	-	-	1,104	Paper/cardboard	50%	2	40%	43%	0	0	1	2	902
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	1	15%	87%	0	0	0	1	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Other	Services - Other Misc.	237	spaces	556	lb/ space	66	Paper/cardboard	33%	22	40%	43%	2	1	12	28	41
								Textiles	11%	7	24%	50%	0	0	3	6	
								Food waste	13%	8	15%	87%	1	0	3	8	
								Wood	3%	2	43%	23%	0	0	1	2	
								Garden and Park waste	7%	5	20%	28%	0	0	1	2	
Other Industrial ¹³	-	Manufacturing - Industrial / Machinery	-	-	-	-	444	Paper/cardboard	37%	163.8	40%	43%	14.0	5.8	86.8	208.5	255
								Textiles	6%	26.6	24%	50%	1.6	0.7	9.9	23.8	
								Food waste	3%	13.3	15%	87%	0.9	0.4	5.4	12.9	
								Wood	9%	38.6	43%	23%	1.9	0.8	12.0	28.8	
								Garden and Park waste	4%	16.9	20%	28%	0.5	0.2	2.9	7.0	
Total																	16,757

Notes:

1. Since waste data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego. See previous tables for the conversion of square footage into number of employees.
2. When not provided by the Port of San Diego or tenants, the Waste Disposal Factor is based on California Integrated Waste Management Board waste disposal data. See previous tables for details.
3. The Percent of Waste Profile for each degradable waste type is the fraction of the total waste disposed. See previous tables for details.
4. The percent Degradable Organic Carbon (DOC) is the fraction of degradable carbon in each degradable waste type. Data for percent DOC is based on IPCC Guidelines. See previous tables for details.
5. The percent Degradable Anaerobic Fraction (DANF) is the fraction of each degradable waste type that is capable of decomposition in anaerobic conditions. Data for percent DANF is based on California Air Resources Board data. See previous tables for details.
6. Represents the total carbon dioxide emissions plus methane emissions converted to carbon dioxide equivalents by a global warming potential factor of 21 based on CCAR 2009. Emission estimates follow CalEEMod guidance and account for an oxidation efficiency of methane of 10%, a destruction efficiency of landfill gas of 98%, and a collection efficiency of landfill gas of 67% per the San Diego County GHG Inventory (1997-2007 data).
7. Other than the land uses defined in this table, waste from these facilities was assumed to be minimal.
8. Yacht club and marina emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
9. Sport fishing and Commercial Sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
10. Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
11. The South Bay Power Plant was not included in the inventory but is provided here for informational purposes.
12. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative waste data.
13. Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative waste data.

Abbreviations:

CalEEMod - California Emissions Estimator Model
 CARB - California Air Resources Board
 CCAR - California Climate Action Registry
 CIWMB - California Integrated Waste Management Board
 CO₂ - carbon dioxide
 CO₂e - carbon dioxide equivalent
 DANF - Degradable anaerobic fraction
 DOC - Degradable Organic Carbon
 IPCC - Intergovernmental Panel on Climate Change
 lb - pound
 SBPP - South Bay Power Plant
 yr - year

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
 CalEEMod. California Emissions Estimator Model. Available online at: <http://www.caleemod.com/>
 San Diego County Greenhouse Gas Inventory. September 2008. Prepared by the University of San Diego and EPIC. Available online at: <http://www.sandiego.edu/epic/ghginventory/>

Table A-11
Baseline (2006) Inventory
Emissions from Maritime Activities
San Diego Unified Port District

Sector	Total Emissions ¹	
	metric tons CO ₂ e/yr	
Ocean Going Vessels	60,806	55,162
Cargo Handling Equipment	4,452	4,039
Commercial Harbor Craft	22,967	20,835
Locomotive	3,400	3,085
Heavy Duty Vehicles	32,345	29,343
Cruise Terminal Transportation	4,222	3,830
Total		116,294

Notes:

1. In March of 2008, Starcrest Consulting Group released a maritime emissions inventory for the Port of San Diego for year 2006. Maritime emissions presented here are reflective of those calculated in the Starcrest Report.

Abbreviations:

CO₂e - carbon dioxide equivalent

yr - year

Sources:

The Port of San Diego 2006 Emissions Inventory. March 2008. Prepared by Starcrest Consulting Group, LLC. Available online at: http://sandiegohealth.org/port/2006_emissions_inventory_final.pdf

Table B-1
2020 BAU Inventory
Electricity and Natural Gas Emissions - Land Use Based Metric
San Diego Unified Port District

Tenant Type	Building Type ¹	CEUS Category Mapping	Activity Data ¹ (SF)	Electricity Energy Intensity ² (kWh/SF/yr)	Natural Gas Energy Intensity ² (therm/SF/yr)	Electricity Usage (kWh)	Natural Gas Usage (therm)	Electricity Emission Factor ³ (lb CO ₂ e/MWh)	Natural Gas Emission Factor ³ (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Retail	66,517	15.49	0.024	1,030,350	1,624	782.07	11.73	374
Retail - 2008 T24	-	Retail	11,701	14.79	0.024	173,105	283			63
Office	-	All Office	37,177	16.40	0.242	609,684	9,002			264
Restaurant	-	Restaurant	224,499	43.73	1.768	9,817,202	396,952			5,594
Restaurant - 2005 T24	-	Restaurant	4,351	42.56	1.767	185,175	7,689			107
Restaurant - 2008 T24	-	Restaurant	37,001	42.56	1.767	1,574,729	65,390			906
Lodging	Rooms	Lodging	5,086,542	16.10	0.617	81,912,785	3,140,894			45,766
	Rooms - 2005 T24	Lodging	1,028,487	15.40	0.616	15,842,665	633,547			8,990
	Rooms - 2008 T24	Lodging	3,267,801	15.40	0.616	50,336,744	2,012,963			28,565
	Restaurant	Restaurant	262,100	43.73	1.768	11,461,457	463,437			6,531
	Restaurant - 2005 T24	Restaurant	33,000	42.56	1.767	1,404,450	58,319			808
	Restaurant - 2008 T24	Restaurant	152,770	42.56	1.767	6,501,733	269,981			3,743
	Meeting Area	All Office	537,900	16.40	0.242	8,821,190	130,250			3,822
	Meeting Area - 2008 T24	All Office	490,667	15.75	0.236	7,730,366	115,644			3,357
	Retail	Retail	13,450	15.49	0.024	208,340	328			76
	Retail - 2008 T24	Retail	265,579	14.79	0.024	3,928,993	6,422			1,428
	Office	All Office	17,081	16.40	0.242	280,117	4,136			121
	Warehouse/Storage	-	Unrefrigerated Warehouse	115,968	4.54	0.021	526,412			2,416
Museums	Museum	Miscellaneous	1,931	9.72	0.124	18,767	240			8
	Office	All Office	200	16.40	0.242	3,280	48			1
	Retail	Retail	11,200	15.49	0.024	173,488	273			63
	Restaurant	Restaurant	7,000	43.73	1.768	306,105	12,377			174
Classrooms	Classrooms, Offices, Lockers - 2008 T24	Miscellaneous	4,663	9.39	0.123	43,783	574			19
Rental Car	Retail	Retail	52,332	15.49	0.024	810,621	1,278			294
Yacht Clubs	Car Wash	Unrefrigerated Warehouse	6,108	4.54	-	27,726	-			10
	General Building	Miscellaneous	97,934	-	0.124	-	12,150			65
	General Building - 2008 T24 Standards	Miscellaneous	5,000	-	0.123	-	615			3
Marinas	Restaurant	Restaurant	5,332	43.73	1.768	233,175	9,428			133
	General Building	Miscellaneous	142,641	-	0.124	-	17,696			94
	General Building - 2005 T24	Miscellaneous	5,468	-	0.123	-	673			4
	General Building - 2008 T24	Miscellaneous	10,000	-	0.123	-	1,230			7
	Office	All Office	32,120	16.40	0.242	526,746	7,778			228
	Retail	Retail	4,163	15.49	0.024	64,485	102			23
	Restaurant	Restaurant	19,679	43.73	1.768	860,549	34,796			490
Sport fishing	General Building	Miscellaneous	6,991	-	0.124	-	867			5
	Restaurant	Restaurant	1,409	43.73	1.768	61,615	2,491			35
Commercial Sport fishing	General Building	Miscellaneous	17,403	-	0.124	-	2,159			11
	Office	All Office	13,152	16.40	0.242	215,680	3,185			93
Excursions	Retail	Retail	4,100	15.49	0.024	63,509	100			23
	Retail	Retail	1,241	15.49	0.024	19,223	30			7
Petroleum	Restaurant	Restaurant	1,600	43.73	1.768	69,967	2,829			40
	Office	All Office	2,055	16.40	0.242	33,701	498			15
Boatyards	Retail	Retail	15,338	15.49	0.024	237,585	374			86
	Office	All Office	16,886	16.40	0.242	276,919	4,089			120
	Retail	Retail	1,000	15.49	0.024	15,490	24			6
Terminal Tenants	Office	All Office	266,100	16.40	0.242	4,363,857	64,435			1,891
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	433,143	4.54	0.021	1,966,160	9,024			745
	Car Wash	Unrefrigerated Warehouse	8,701	4.54	-	39,496	-			14
	Refrigerated Warehouse	Refrigerated Warehouse	288,000	35.31	0.071	10,169,519	20,502			3,717
Industrial	Office	All Office	38,913	16.40	0.242	638,138	9,422			276
	Miscellaneous	Miscellaneous	301,021	9.72	0.124	2,925,528	37,345			1,236
	Refrigerated Warehouse	Refrigerated Warehouse	60,311	35.31	0.071	2,129,614	4,293			778
Other Commercial ⁴	-	-	-	-	-	1,591,131	30,629			727
Total										122,159

Notes:

1. Since CEUS data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego.

2. Electricity and natural gas intensities are derived from the 2006 California Commercial End-Use Survey (CEUS), performed by Itron under contract to the California Energy Commission (CEC). Energy usage rates are based on 2002 consumption data, unless they are designated as 2005 T24 or 2008 T24 (under Tenant/Building Type), in which case they are adjusted to reflect the energy intensities equivalent to meeting 2005 Title 24 standards (all buildings under '2008 T24' standards are estimated using 2005 T24 standards to reflect a "Business as Usual" scenario). Adjustments to reflect 2005 T24 standards were made per data provided in CEC Impact Analysis reports (CEC 2003). ENVIRON used data for San Diego Gas & Electric, Zone 13, which is the sector in which the Port of San Diego is located.

3. See previous tables for the calculation of the electricity and natural gas emission factors.

4. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative CEUS data.

Abbreviations:

BAU - Business-As-Usual

CEC - California Energy Commission

CEUS - California Commercial End-Use Survey

CO₂e - carbon dioxide equivalent

kWh - kilowatt-hour

lb - pound

MWh - megawatt-hour

SF - square feet

T24 - Title 24

yr - year

Sources:

California Energy Commission. 2006. California Commercial End-Use Survey. Prepared by Itron Inc. Available at: <http://www.energy.ca.gov/ceus/>

California Energy Commission. 2003. Impact Analysis: 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Available at: http://www.energy.ca.gov/title24/2005standards/archive/rulemaking/documents/2003-07-11_400-03-014.PDF

Table B-2
2020 BAU Inventory
Electricity and Natural Gas Emissions - Other Metrics
San Diego Unified Port District

Tenant Type	Energy Source	Activity Data ¹ (Unit)	Unit	Energy Intensity	Units	Energy Usage	Units	Electricity Emission Factor ² (lb CO ₂ e/MWh)	Natural Gas Emission Factor ² (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
Port ³	Electricity	-				10,905,642	kWh	782.07	11.73	3,941
	Natural Gas	-				63,119	therm			342
Yacht Clubs ⁴	Electricity	2,337	Slips	3,125	(kWh/unit/yr)	7,303,125	kWh			2,591
Marinas ⁴	Electricity	5,410	Slips			16,906,250				5,997
Sport fishing ⁴	Electricity	75	Slips			234,375				83
Commercial Sport fishing ⁴	Electricity	125	Slips			390,625				139
Boatyards ⁵	Electricity	1,275,429	SF	2.44	(kWh/unit/yr)	3,108,438	kWh			1,103
	Natural Gas	1,275,429	SF	0.002	(therm/unit/yr)	2,227	therm			12
Shipbuilding ⁶	Electricity	4,639,831	SF	56.76	(kWh/unit/yr)	263,367,151	kWh			93,428
	Natural Gas	4,639,831	SF	0.001	(therm/unit/yr)	5,265	therm			28
Other Commercial ⁷	Electricity	-				29,693,106	kWh			10,533
	Natural Gas	-				331,180	therm			1,762
Other Industrial ⁸	Electricity	-				24,647,874	kWh			8,744
Total										128,702

Notes:

- Activity data was provided by the Port of San Diego.
- See previous tables for the calculation of the electricity and natural gas emission factors.
- Emissions due to Port electricity and natural gas use were derived from data provided by the Port of San Diego.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

BAU - Business-As-Usual
CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MWh - megawatt-hour
SF - square feet

Table B-3
2020 BAU Inventory
Stationary Combustion (Natural Gas) Emissions
San Diego Unified Port District

Tenant Type	Fuel Use	Usage	Units	Emission Factors ¹ (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
CP Kelco ²	General Stationary Combustion, Cogeneration (Natural Gas)	-			95,833
Other Industrial ³	General Stationary Combustion	2,699,865	therms	11.71	14,340
Total					110,173

Notes:

1. Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
2. Emissions from CP Kelco were reported to CARB in 2008. These emissions are assumed to be representative of year 2020.
3. Other Industrial includes industrial tenants who did not report to CARB. Emissions were calculated based on data provided by the tenants.

Abbreviations

BAU - Business-As-Usual

CARB - California Air Resources Board

CCAR - California Climate Action Registry

CO₂e - carbon dioxide equivalent

lb - pound

Sources:

California Air Resources Board. Mandatory Greenhouse Gas Reporting. Available online at: http://arb.ca.gov/cc/reporting/ghg-rep/regulation/2010_regulation.htm

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table B-4
2020 BAU Inventory
Stationary Combustion (Diesel) Emissions
San Diego Unified Port District

Tenant Type	Fuel Use	Usage	Units	Emission Factors ¹ (lb CO ₂ e/unit)	Total Emissions (metric tons CO ₂ e/yr)
Port Events ²	General Stationary Combustion	413	gallons	22.46	4
Other Commercial ³	General Stationary Combustion	249	gallons		3
Other Industrial ⁴	General Stationary Combustion	68,934	gallons		702
Total					709

Notes:

1. Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
2. Diesel stationary combustion from Port events is solely from generators. Data was provided by the Port of San Diego.
3. Other Commercial includes commercial tenants with diesel stationary combustion. Emissions were calculated based on data provided by tenants.
4. Other Industrial includes industrial tenants with diesel stationary combustion. Emissions were calculated based on data provided by tenants.

Abbreviations

BAU - Business-As-Usual
CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MWh - megawatt-hour
SF - square feet

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at:
http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table B-5
2020 BAU Inventory
Emissions from Water Use - Land Use Based Metric
San Diego Unified Port District

Tenant Type	Building Type ¹	Land use Mapping	Activity Data ¹ (Unit)	Unit	Indoor Water Usage Factor ² (Gallons/Unit/yr)	Outdoor Water Usage Factor ² (Gallons/Unit/yr)	Indoor Water Usage (MG/yr)	Outdoor Water Usage (MG/yr)	Indoor Water Energy Intensity ³ (kWh/MG)	Outdoor Water Energy Intensity ³ (kWh/MG)	Electricity Usage (kWh)	Electricity Emission Factor ⁴ (lb CO ₂ e/MWh)	Total Emissions (metric tons CO ₂ e/yr)			
Retail	-	Strip Mall	112	employee	21,204	12,996	2.37	1.46	13,022	11,111	47,098	782.07	17			
Office	-	General Office Building	150	employee	17,717	10,859	2.66	1.63			52,703		19			
Restaurant	-	High turnover (sit down restaurant)	687	employee	56,048	3,578	38.50	2.46			528,715		188			
Lodging ⁵	Occupied Rooms	Hotel	8,927	occupied rooms	38,435	4,271	343.11	38.12			4,891,606		1,735			
	Restaurant	Quality Restaurant	1,156	employee	56,048	3,578	64.79	4.14			889,658		316			
	Meeting Area	General Office Building	4,132	employee	17,717	10,859	73.20	44.87			1,451,791		515			
	Retail	Strip Mall	398	employee	21,204	12,996	8.44	5.17			167,366		59			
	Office	General Office Building	69	employee	17,717	10,859	1.22	0.75			24,243		9			
Warehouse/Storage	-	Unrefrigerated Warehouse	119	employee	797,340	0	94.88	0.00			1,235,572		438			
Museums	Museum	Government Office Building	10	employee	18,972	11,628	0.19	0.12			3,763		1			
	Office	General Office Building	1	employee	17,717	10,859	0.02	0.01			351		0.1			
	Retail	Strip Mall	16	employee	21,204	12,996	0.34	0.21			6,728		2			
	Restaurant	High turnover (sit down restaurant)	19	employee	56,048	3,578	1.06	0.07			14,622		5			
Classrooms	Classrooms, Offices, Lockers	Elementary School	63	student	2,424	6,234	0.15	0.39						6,352		2
Rental Car		Strip Mall	75	employee	21,204	12,996	1.59	0.97						31,539		11
Yacht Clubs		Quality Restaurant	14	employee	56,048	3,578	0.78	0.05						10,774		4
Marinas		General Office Building	129	employee	17,717	10,859	2.29	1.40						45,325		16
		Strip Mall	6	employee	21,204	12,996	0.13	0.08						2,523		1
		High turnover (sit down restaurants)	51	employee	56,048	3,578	2.86	0.18						39,250		14
Sport fishing		High turnover (sit down restaurant)	4	employee	56,048	3,578	0.22	0.01						3,078		1
Commercial Sport fishing		General Office Building	53	employee	17,717	10,859	0.94	0.58						18,622		7
		Strip Mall	6	employee	21,204	12,996	0.13	0.08						2,523		1
		Strip Mall	2	employee	21,204	12,996	0.04	0.03						841		0.3
Excursions		High turnover (sit down restaurant)	5	employee	56,048	3,578	0.28	0.02						3,848		1
Petroleum	Gas Station	Gasoline/Service Station	14	employee	21,204	12,996	0.30	0.18						5,887		2
	Office	General Office Building	9	employee	17,717	10,859	0.16	0.10						3,162		1
	Retail	Strip Mall	9	employee	21,204	12,996	0.19	0.12						3,785		1
Boatyards		General Office Building	68	employee	17,717	10,859	1.20	0.74						23,892		8
Port Buildings		Strip Mall	2	employee	21,204	12,996	0.04	0.03						841		0.3
	Office	General Office Building	12	employee	17,717	10,859	0.21	0.13						4,216		1
Terminal Tenants ⁶	Unrefrigerated Warehouse	Unrefrigerated Warehouse	37	employee	797,340	0	29.50	0						384,169		136
	Office	General Office Building	97	employee	17,717	10,859	1.72	1.05						34,081		12
Shipbuilding	Unrefrigerated Warehouse	Unrefrigerated Warehouse	157	employee	797,340	0	125.18	0						1,630,125		578
	Heavy Industry	General Heavy Industry	1,649	employee	797,340	0	1,314.81	0						17,121,500		6,074
Industrial	Office	General Office Building	157	employee	17,717	10,859	2.78	1.70						55,162		20
	Light Industry	General Light Industry	500	employee	797,340	0	398.67	0						5,191,480		1,842
	Heavy Industry	General Heavy Industry	115	employee	797,340	0	91.69	0						1,194,040		424
Other Commercial ⁷	-	-	-	-	-	-	12.05	1.27						170,933.0		61
Total													12,523			

Notes:

1. Since water usage data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego. See previous tables for the conversion of square footage into number of employees.
2. ENVIRON used data from the Pacific Institute's "Waste Not Want Not" report and US Census Data to estimate the amount of water used at each land use type. See previous tables for details.
3. ENVIRON used energy intensities for indoor and outdoor water use for Southern California from California Energy Commission 2006 Report, *Refining Estimates of Water-Related Energy Use in California*. This includes energy used for water supply and conveyance, treatment, distribution, and wastewater treatment (for indoor water). See previous tables for details.
4. See previous tables for the calculation of the electricity emission factor.
5. The water use rate for lodging is per occupied room, therefore an average occupancy rate for year 2006 (assumed to be the same in future years) in San Diego County was used to estimate the number of occupied rooms. The average occupancy rate is from the San Diego Convention & Visitors Bureau.
6. Terminal tenants only include those who are not on the Port water meters. See later tables for the inclusion of Port water use.
7. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative water usage rates.

Abbreviations

BAU - Business-As-Usual
CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MG - million gallons of water
MWh - megawatt-hour
yr - year

Sources:

California Energy Commission. 2006. Refining Estimates of Water Related Energy Use in California. CEC-500-2006-118. Available at: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>
Pacific Institute (Gleick, P.H.; Haasz, D.; Henges-Jeck, C.; Srinivasan, V.; Cushing, K.K.; Mann, A.) 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California. Available at: http://www.pacinst.org/reports/urban_usage/
San Diego Convention & Visitors Bureau. San Diego County Visitor Industry Summary for 2006. <http://www.sandiego.org/nav/Visitors>
US Census Bureau. 2000 Census. Table QT-H1: General Housing Characteristics 2000. Available online at: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>

Table B-6
2020 BAU Inventory
Emissions from Water Use - Other Metrics
San Diego Unified Port District

Tenant Type	Activity Data ¹ (Unit)	Unit	Indoor Water Usage Factor (Gallons/Unit/yr)	Outdoor Water Usage Factor (Gallons/Unit/yr)	Indoor Water Usage (MG/yr)	Outdoor Water Usage (MG/yr)	Indoor Water Energy Intensity ² (kWh/MG)	Outdoor Water Energy Intensity ² (kWh/MG)	Electricity Usage (kWh)	Electricity Emission Factor ³ (lb CO ₂ e/MWh)	Total Emissions (metric tons CO ₂ e/yr)
Port ⁴		-			192	-			2,505,852		889
Boatyards ⁵	1,275,429	SF	36	-	45.7	-			595,604		211
Rental Car ⁶	687,150	cars	-	27	-	19			206,143		73
Yacht Clubs ⁷	2,337	Slips				2			25,155		9
Marinas ⁷	5,410	Slips				5			58,232		21
Sport fishing ⁷	75	Slips				0.1			807		0.3
Commercial Sport fishing ⁷	125	Slips				0.1			1,345		0.5
Terminal Tenant Car Wash ⁶	978,863	cars	-	27	-	26			293,656		104
Other Commercial ⁸		-			46	130.4			2,050,509		727
Other Industrial ⁹		-			16	-			202,287		72
Total											2,107

Notes:

- Activity data was provided by the Port of San Diego.
- ENVIRON used energy intensities for indoor and outdoor water use for Southern California from California Energy Commission 2006 Report, *Refining Estimates of Water-Related Energy Use in California*. This includes energy used for water supply and conveyance, treatment, distribution, and wastewater treatment (for indoor water). See previous tables for details.
- See previous tables for the calculation of the electricity emission factor.
- Port includes water use from Port owned and operated buildings, National City Marine Terminal (NCMT), Tenth Avenue Marine Terminal (TAMT) (with the exclusion of some tenants who are on their own water meter), and the Cruise Ship Terminal (CST).
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Water use from car washes was calculated based on a metric developed from participating representative tenants to calculate the number of cars washed annually. Average water use per car wash is from the International Car Wash association; the mean value from conveyor car washes was used.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

BAU - Business-As-Usual
CO₂e - carbon dioxide equivalent
CST - Cruise Ship Terminal
kWh - kilowatt-hour
lb - pound
MG - million gallons of water
MWh - megawatt-hour
NCMT - National City Marine Terminal
SF - square feet
TAMT - Tenth Avenue Marine Terminal
yr - year

Source:

California Energy Commission. 2006. Refining Estimates of Water Related Energy Use in California. CEC-500-2006-118. Available at: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>
International Car Wash Association. *Water Use in the Professional Car Wash Industry*. 2002. Available online at: <http://www.carwash.org/operatorinformation/research/Pages/EnvironmentalReports.aspx>

Table B-7
2020 BAU Inventory
On-Road Transportation - VMT/Trip Based Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Trip Generation Mapping	Trip Length Mapping	Activity Data ²	units	Trip Generation Rate ³	units/day	Vehicle Trips per yr ⁴	Trip Length (miles) ⁵	Yearly VMT	Fleet wide Running Emission Factor ⁶ (g/VMT)	Fleet wide Starting/Idling Emission Factor ⁷ (g/trip)	Annual Emissions ⁸ (metric tons CO ₂ e/yr)
Retail	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	78	1,000 sq ft	40	trips/1,000 sq ft	1,141,987	4.3	4,910,545			2,655
Office	Office	Standard Commercial Office	Office	37	1,000 sq ft	20	trips/1,000 sq ft	271,395	8.8	2,388,276			1,267
Restaurant	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	266	1,000 sq ft	130	trips/1,000 sq ft	12,614,642	4.7	59,288,818			31,954
Lodging ⁹	Lodging	Hotel (w/convention facilities/restaurant)	Lodging	8,927	occupied rooms	10	trips/occupied room	32,584,306	7.6	247,640,722			131,734
Warehouse/Storage	Warehouse	Warehousing	Industrial Plant	116	1,000 sq ft	5	trips/1,000 sq ft	211,642	11.7	2,476,207			1,307
Museum	Museum	Government Office (Civic Center)	Government Office	2	1,000 sq ft	30	trips/1,000 sq ft	21,144	6	126,867			68
Museums	Office	Standard Commercial Office	Office	0.2	1,000 sq ft	20	trips/1,000 sq ft	1,460	8.8	12,848			7
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	11	1,000 sq ft	40	trips/1,000 sq ft	163,520	4.3	703,136			380
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	7	1,000 sq ft	130	trips/1,000 sq ft	332,150	4.7	1,561,105			841
Classrooms	Elementary School	Elementary School	Elementary School	5	1,000 sq ft	39	trips/1,000 sq ft	66,378	3.4	225,685			123
Yacht Club	Restaurant	Restaurant: Quality	Restaurant	5	1,000 sq ft	100	trips/1,000 sq ft	194,627	4.7	914,746			493
Marinas	Slips	Marinas	Marinas	2,337	slips	4	trips/berth	3,412,020	6.3	21,495,726			11,485
	Office	Standard Commercial Office	Office	32	1,000 sq ft	20	trips/1,000 sq ft	234,476	8.8	2,063,389			1,094
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	4	1,000 sq ft	40	trips/1,000 sq ft	60,780	4.3	261,353			141
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	20	1,000 sq ft	130	trips/1,000 sq ft	933,769	4.7	4,388,712			2,365
Sport fishing	Slips	Marinas	Marinas	5,410	slips	4	trips/berth	7,898,600	6.3	49,761,180	495	82	26,587
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	1	1,000 sq ft	130	trips/1,000 sq ft	66,857	4.7	314,228			169
	Slips	Marinas	Marinas	75	slips	4	trips/berth	109,500	6.3	689,850			369
Commercial Sport fishing	Office	Standard Commercial Office	Office	13	1,000 sq ft	20	trips/1,000 sq ft	96,008	8.8	844,872			448
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	4	1,000 sq ft	40	trips/1,000 sq ft	59,860	4.3	257,398			139
	Slips	Marinas	Marinas	247	slips	4	trips/berth	360,620	6.3	2,271,906			1,214
Excursions	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	1	1,000 sq ft	40	trips/1,000 sq ft	18,119	4.3	77,910			42
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	2	1,000 sq ft	130	trips/1,000 sq ft	75,920	4.7	356,824			192
Petroleum	Office	Standard Commercial Office	Office	2	1,000 sq ft	20	trips/1,000 sq ft	15,002	8.8	132,013			70
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	6	1,000 sq ft	40	trips/1,000 sq ft	88,432	4.3	380,258			206
	Fueling Stations	Gasoline Station with food mart	Gasoline with Food Mart	2	stations	865	trips/station	631,731	2.8	1,768,846			975
Open Space	Park: Developed	Parks	Parks	187	acres	50	trips/acre	3,413,978	5.4	18,435,483			9,892
Boatyards	Boatyard	Manufacturing/Assembly	Industrial Plant	29	acres	50	trips/acre	534,357	11.7	6,251,973			3,301
	Office	Standard Commercial Office	Office	17	1,000 sq ft	20	trips/1,000 sq ft	123,268	8.8	1,084,757			575
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	1	1,000 sq ft	40	trips/1,000 sq ft	14,600	4.3	62,780			34
Terminal Tenants	Office	Standard Commercial Office	Office	273	1,000 sq ft	20	trips/1,000 sq ft	1,990,619	8.8	17,517,413			9,291
	Unrefrigerated Warehouse	Warehousing	Industrial Plant	544	1,000 sq ft	5	trips/1,000 sq ft	993,587	11.7	11,624,963			6,138
	Refrigerated Warehouse	Warehousing	Industrial Plant	288	1,000 sq ft	5	trips/1,000 sq ft	525,600	11.7	6,149,520			3,247
Port Offices		Standard Commercial Office	Office	260	1,000 sq ft	20	trips/1,000 sq ft	1,895,014	8.8	16,676,124			8,845
Port Warehouses		Warehousing	Industrial Plant	946	1,000 sq ft	5	trips/1,000 sq ft	1,726,635	11.7	20,201,632			10,666
Shipbuilding		Manufacturing/Assembly	Industrial Plant	107	acres	50	trips/acre	1,943,915	11.7	22,743,800			12,008
Industrial Tenants	Office	Standard Commercial Office	Office	39	1,000 sq ft	20	trips/1,000 sq ft	284,061	8.8	2,499,739			1,325
	Refrigerated Warehouse	Warehousing	Industrial Plant	39	1,000 sq ft	5	trips/1,000 sq ft	71,015	11.7	830,879			439
	Other Tenants	Manufacturing/Assembly	Industrial Plant	64	acres	50	trips/acre	1,165,577	11.7	13,637,253			7,200
Rental Car ⁸				-				280,320	15.2	4,259,637	1,295	29	5,816
Events ⁹			Parks	-		-		342,150	5.4	1,847,610	495	82	991
Other Commercial ¹⁰				-		-		8,519,279	8.3	70,943,867			37,669
Total													333,765

Notes:

- Since trip data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego.
- The Trip Generation Rate represents the total number of trips (one-way trips) that are generated by a site with the given land use. Trip generation rates are from the San Diego Municipal Code, Land Development Code, Trip Generation Manual (May 2003) and the SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002). See previous tables for details.
- Annual vehicle trips are calculated assuming the weekday trip rate applies during the weekend (assuming 365 days per year of weekday travel rates).
- Trip lengths are from SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002) and represent average weighted trip lengths for all trips to and from the general land use site. See previous tables for details.
- The fleet wide running and starting emission factors are calculated from EPA/CARB 2007 for San Diego County for year 2020. See previous tables for calculation details.
- CO₂e=CO₂/0.95: The United States Environmental Protection Agency (USEPA) recommends assuming that CH₄, N₂O, and HFCs are 5% of emissions on a CO₂e basis.
- The trip rate for lodging is per occupied room, therefore an average occupancy rate for year 2006 (assumed to be the same in future years) in San Diego County was used to estimate the number of *occupied* rooms. The average occupancy rate is from the San Diego Convention & Visitors Bureau.
- Rental car bus trips were calculated based on a metric developed from participating representative tenants. Emissions factors are for the EMFAC vehicle class 'Other Bus'.
- Event data, including attendees, was provided by the Port of San Diego. Each attendee was conservatively assumed to drive their own car to and from the event. Trip length data was assumed to be equal to that of parks, as all events are held in the parks.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative trip data.

Abbreviations:

BAU - Business-As-Usual
 CH₄ - methane
 CO₂ - carbon dioxide
 CO₂e - carbon dioxide equivalent
 g - gram
 HFC - hydrofluorocarbons
 N₂O - nitrous oxide
 SANDAG - San Diego Association of Governments
 sq ft - square feet
 USEPA - United States Environmental Protection Agency
 VMT - vehicle miles traveled
 yr - year

Sources:

San Diego Convention & Visitors Bureau: San Diego County Visitor Industry Summary for 2006. <http://www.sandiego.org/nsv/Visitors>
 San Diego Municipal Code, Land Development Code, Trip Generation Manual, May 2003. Available online at: <http://www.sandiego.gov/planning/pdf/tripmanual.pdf>
 SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002. Available online at: http://www.sandag.org/uploads/publicationid/publicationid_1140_5044.pdf

Table B-8
2020 BAU Inventory
On-Road Transportation - Fuel Based Emissions
San Diego Unified Port District

Tenant Type	Fuel	Activity Data ¹ (Unit)	Unit	Fuel Intensity (gal/unit/yr)	Fuel Usage (gallons)	Emission Factors ² (lb CO ₂ e/gallon)	Total Emissions (metric tons CO ₂ e/yr)
Port On-Road ³				-			978
Rental Car ⁴	Gasoline		-		1,558,314	20.44	14,451
Boatyards ⁵	Gasoline	1,275,429	SF	0.03	40,633	20.44	377
Shipbuilding ⁶	Gasoline	align="right">4,639,831	align="center">SF	0.060	279,603	20.44	2,593
	Diesel			0.047	216,209	23.55	2,310
	LPG			0.029	133,665	13.87	841
Other Commercial ⁷	Gasoline			-			20
	Propane			-			120
Other Industrial ⁸	Diesel			-			6,016
Total							27,707

Notes:

- Activity data was provided by the Port of San Diego.
- Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
- Emissions due to Port on-road transportation were derived from data provided by the Port of San Diego.
- Emissions from rental cars are scaled from the San Francisco Airport Climate Action Plan, based on passenger count statistics for year 2006 (assumed to be representative of future years) for San Diego Airport and San Francisco International Airport. There are a total of 16 rental car agencies at the San Diego Airport, 4 of which are within the Port's jurisdiction, therefore the total rental car emissions are scaled by (4/16).
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards. This was assumed to be separate from commute/customer/vendor trips, which are quantified under the VMT based on-road emissions.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage. This was assumed to be separate from commute/customer/vendor trips, which are quantified under the VMT based on-road emissions.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

BAU - Business-As-Usual
 CCAR - California Climate Action Registry
 CO₂e - carbon dioxide equivalent
 gal - gallon
 lb - pound
 LPG - liquefied petroleum gas
 SF - square feet
 VMT - vehicle miles traveled
 yr - year

Sources:

Bureau of Transportation Statistics. T-100 Segment data for Airport Flight Data. http://www.transtats.bts.gov/Data_Elements.aspx?Data=2. Accessed January, 2011.

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

San Francisco International Airport. 2010. SFO Climate Action Plan. Available online at: <http://www.flysfo.com/web/page/about/green/index.html>. Accessed February, 2011.

San Diego International Airport Rental Car Agencies. http://www.san.org/sdia/transportation/car_rental.aspx. Accessed August, 2011.

Table B-9
2020 BAU Inventory
Emissions from Off-road Equipment Use
San Diego Unified Port District

Tenant Type	Fuel	Activity Data ¹ (Unit)	Unit	Fuel Intensity (gal/unit/yr)	Fuel Usage (gallons)	Emission Factors ² (lb CO ₂ e/gallon)	Total Emissions (metric tons CO ₂ e/yr)
Port Off-road ³				-			591
Yacht Clubs ⁴	Gasoline	2,337	Slips	14	32,322	19.60	287
Marinas ⁴	Gasoline	5,410	Slips		74,823	19.60	665
Sportfishing ⁴	Gasoline	75	Slips		1,037	19.60	9
Commercial Sportfishing ⁴	Gasoline	247	Slips		3,416	19.60	30
Recreational Boating ⁵				-			117,961
Boatyards ⁶	Diesel	1,275,429	SF	0.041	52,823	22.58	541
	Propane			0.012	15,396	12.94	90
Shipbuilding ⁷	Diesel	4,639,831	SF	0.129	596,477	22.58	6,110
Lumber Yards ⁸	Diesel	954,603	-	0.042	39,966	22.58	409
	LPG		-	0.013	12,174	13.05	72
Other Commercial ⁹	Gasoline		-		12,592	20	112
Other Industrial ¹⁰	Diesel			-			63
Total							126,943

Notes:

- Activity data was provided by the Port of San Diego.
- Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
- Emissions due to Port off-road transportation were derived from data provided by the Port of San Diego.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- OFFROAD2007 was run for San Diego County for year 2020. The total emissions were scaled by the % of boating days spent on the Ocean versus the Delta, SF Bay, and Inland Lakes for residents within the South Coast over years 2007-2008 (California Boater Survey, July 2011). This assumption, in effect, adjusts the San Diego County boat population and activity to reflect only those boats which are active off of the coastline of San Diego County. The fleet mix and boating habits within San Diego County are assumed to be similar to that surveyed in the South Coast. Total emissions from boating activity in the ocean (off the San Diego County coastline) were then adjusted by the portion of slip area present within the Port of San Diego versus the slip area present within the San Diego County coastline.
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Lumber yard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

BAU - Business-As-Usual
 CCAR - California Climate Change Registry
 CO₂e - carbon dioxide equivalent
 gal - gallon
 lb - pound
 LCFS - Low Carbon Fuel Standard
 LPG - liquefied petroleum gas
 SF - square feet
 yr - year

Sources:

2007-2009 California Boater Survey. July 2011. Available online at: <http://www.coastal.ca.gov/ccbn/materialsforeducators.html>
 California Air Resources Board (CARB). 2006. Off-Road Emissions Inventory Program (OFFROAD2007). Available Online: <http://www.arb.ca.gov/msei/offroad/offroad.htm>
 California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table B-10
2020 BAU Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Retail, Other Stores	112	employees	1,719	lb/ employee	96	Paper/cardboard	32%	31	40%	43%	3	1	17	32	46
								Textiles	4%	4	24%	50%	0	0	2	3	
								Food waste	11%	11	15%	87%	1	0	5	8	
								Wood	13%	12	43%	23%	1	0	4	7	
								Garden and Park waste	2%	2	20%	28%	0	0	0	1	
Office	-	Large Office Buildings	37	1,000 square feet	1,866	lb/ 1,000 square feet	35	Paper/cardboard	50%	17	40%	43%	1	0	10	18	23
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	6	15%	87%	0	0	3	5	
								Wood	4%	1	43%	23%	0	0	0	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Restaurant	-	Full-Service Restaurant	687	employees	4,403	lb/ employee	1,512	Paper/cardboard	17%	262	40%	43%	22	6	148	271	967
								Textiles	0%	6	24%	50%	0	0	2	4	
								Food waste	66%	1,000	15%	87%	65	17	429	785	
								Wood	1%	9	43%	23%	0	0	3	6	
								Garden and Park waste	0%	2	20%	28%	0	0	0	1	
Hotel/Lodging	Hotel - Rooms	Large Hotels	8,146	employees	3,903	lb/ employee	15,897	Paper/cardboard	32%	5,135	40%	43%	439	115	2904	5313	9836
								Textiles	4%	556	24%	50%	33	9	221	404	
								Food waste	36%	5,786	15%	87%	375	98	2483	4543	
								Wood	4%	588	43%	23%	29	8	195	357	
								Garden and Park waste	4%	668	20%	28%	19	5	123	225	
	Restaurant	Full-Service Restaurant	1,156	employees	4,403	lb/ employee	2,545	Paper/cardboard	17%	440	40%	43%	38	10	249	456	1627
								Textiles	0%	10	24%	50%	1	0	4	7	
								Food waste	66%	1,682	15%	87%	109	29	722	1321	
								Wood	1%	15	43%	23%	1	0	5	9	
								Garden and Park waste	0%	3	20%	28%	0	0	0	1	
	Meeting Area	Large Office Buildings	1,029	1,000 square feet	1,866	lb/ 1,000 square feet	960	Paper/cardboard	50%	483	40%	43%	41	11	273	499	638
								Textiles	6%	54	24%	50%	3	1	21	39	
								Food waste	18%	176	15%	87%	11	3	75	138	
								Wood	4%	40	43%	23%	2	1	13	24	
								Garden and Park waste	1%	6	20%	28%	0	0	1	2	
	Retail	Retail, Other Stores	398	employees	1,719	lb/ employee	342	Paper/cardboard	32%	109	40%	43%	9	2	62	113	165
								Textiles	4%	15	24%	50%	1	0	6	11	
								Food waste	11%	38	15%	87%	2	1	16	30	
								Wood	13%	44	43%	23%	2	1	15	27	
								Garden and Park waste	2%	7	20%	28%	0	0	1	2	
	Office	Large Office Buildings	17	1,000 square feet	1,866	lb/ 1,000 square feet	16	Paper/cardboard	50%	8	40%	43%	1	0	5	8	11
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	18%	3	15%	87%	0	0	1	2	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Warehouse/Storage	-	Trucking & Warehousing	119	employees	3,800	lb/ employee	226	Paper/cardboard	35%	79	40%	43%	7	2	45	82	108
								Textiles	6%	13	24%	50%	1	0	5	10	
								Food waste	4%	9	15%	87%	1	0	4	7	
								Wood	14%	31	43%	23%	2	0	10	19	
								Garden and Park waste	2%	5	20%	28%	0	0	1	2	
Museums	Museum	Services - Other Misc.	10	employees	1,800	lb/ employee	9	Paper/cardboard	33%	3	40%	43%	0	0	2	3	5
								Textiles	11%	1	24%	50%	0	0	0	1	
								Food waste	13%	1	15%	87%	0	0	0	1	
								Wood	3%	0	43%	23%	0	0	0	0	
								Garden and Park waste	7%	1	20%	28%	0	0	0	0	
	Office	Large Office Buildings	0.20	1,000 square feet	1,866	lb/ 1,000 square feet	0	Paper/cardboard	50%	0	40%	43%	0	0	0	0	0
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	0	15%	87%	0	0	0	0	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	16	employees	1,719	lb/ employee	14	Paper/cardboard	32%	4	40%	43%	0	0	2	5	7
								Textiles	4%	1	24%	50%	0	0	0	0	
								Food waste	11%	2	15%	87%	0	0	1	1	
								Wood	13%	2	43%	23%	0	0	1	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	19	employees	4,403	lb/ employee	42	Paper/cardboard	17%	7	40%	43%	1	0	4	7	27
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	28	15%	87%	2	0	12	22	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
Classrooms	Elementary School	Services - Other Misc.	15	employees	1,800	lb/ employee	14	Paper/cardboard	33%	4	40%	43%	0	0	3	5	7
								Textiles	11%	1	24%	50%	0	0	1	1	
								Food waste	13%	2	15%	87%	0	0	1	1	
								Wood	3%	0	43%	23%	0	0	0	0	
								Garden and Park waste	7%	1	20%	28%	0	0	0	0	
Rental Car ⁷	Retail	Retail, Other Stores	75	employees	1,719	lb/ employee	64	Paper/cardboard	32%	20	40%	43%	2	0	12	21	31
								Textiles	4%	3	24%	50%	0	0	1	2	
								Food waste	11%	7	15%	87%	0	0	3	6	
								Wood	13%	8	43%	23%	0	0	3	5	
								Garden and Park waste	2%	1	20%	28%	0	0	0	0	

Table B-10
2020 BAU Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Yacht Clubs ⁴	Restaurant	Full-Service Restaurant	14	employees	4,403	lb/ employee	31	Paper/cardboard	17%	5	40%	43%	0	0	3	6	20
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	20	15%	87%	1	0	9	16	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Services - Other Misc.	2,337	slips	556	lb/ slip	649	Paper/cardboard	33%	216	40%	43%	18	5	122	223	331
								Textiles	11%	69	24%	50%	4	1	27	50	
								Food waste	13%	82	15%	87%	5	1	35	64	
								Wood	3%	21	43%	23%	1	0	7	13	
								Garden and Park waste	7%	46	20%	28%	1	0	8	16	
Marinas ⁴	Office	Large Office Buildings	32	1,000 square feet	1,866	lb/ 1,000 square feet	30	Paper/cardboard	50%	15	40%	43%	1	0	9	16	20
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	5	15%	87%	0	0	2	4	
								Wood	4%	1	43%	23%	0	0	0	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	6	employees	1,719	lb/ employee	5	Paper/cardboard	32%	2	40%	43%	0	0	1	2	2
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	0	
								Wood	13%	1	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	51	employees	4,403	lb/ employee	112	Paper/cardboard	17%	19	40%	43%	2	0	11	20	72
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	74	15%	87%	5	1	32	58	
								Wood	1%	1	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Services - Other Misc.	5,410	slips	556	lb/ slip	1,503	Paper/cardboard	33%	499	40%	43%	43	11	282	516	767
								Textiles	11%	159	24%	50%	10	2	63	116	
								Food waste	13%	189	15%	87%	12	3	81	149	
								Wood	3%	48	43%	23%	2	1	16	29	
								Garden and Park waste	7%	107	20%	28%	3	1	20	36	
Sport fishing ⁹	Restaurant	Full-Service Restaurant	4	employees	4,403	lb/ employee	9	Paper/cardboard	17%	2	40%	43%	0	0	1	2	6
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	6	15%	87%	0	0	2	5	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Manufacturing - Food / Kindred	75	slips	1,692	lb/ slip	63	Paper/cardboard	36%	23	40%	43%	2	1	13	24	36
								Textiles	6%	4	24%	50%	0	0	1	3	
								Food waste	22%	14	15%	87%	1	0	6	11	
								Wood	7%	4	43%	23%	0	0	1	3	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Commercial Sport fishing ⁹	Office	Large Office Buildings	13	1,000 square feet	1,866	lb/ 1,000 square feet	12	Paper/cardboard	50%	6	40%	43%	1	0	3	6	8
								Textiles	6%	1	24%	50%	0	0	0	0	
								Food waste	18%	2	15%	87%	0	0	1	2	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	6	employees	1,719	lb/ employee	5	Paper/cardboard	32%	2	40%	43%	0	0	1	2	2
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	0	
								Wood	13%	1	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Slips	Manufacturing - Food / Kindred	247	slips	1,692	lb/ slip	209	Paper/cardboard	36%	76	40%	43%	6	2	43	78	120
								Textiles	6%	12	24%	50%	1	0	5	9	
								Food waste	22%	47	15%	87%	3	1	20	37	
								Wood	7%	14	43%	23%	1	0	4	8	
								Garden and Park waste	1%	1	20%	28%	0	0	0	0	
Excursions ⁷	Retail	Retail, Other Stores	2	employees	1,719	lb/ employee	2	Paper/cardboard	32%	1	40%	43%	0	0	0	1	1
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	0	15%	87%	0	0	0	0	
								Wood	13%	0	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	5	employees	4,403	lb/ employee	11	Paper/cardboard	17%	2	40%	43%	0	0	1	2	7
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	7	15%	87%	0	0	3	6	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
Petroleum ⁷	Office	Large Office Buildings	2	1,000 square feet	1,866	lb/ 1,000 square feet	2	Paper/cardboard	50%	1	40%	43%	0	0	1	1	1
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	0	15%	87%	0	0	0	0	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	22	employees	1,719	lb/ employee	19	Paper/cardboard	32%	6	40%	43%	1	0	3	6	9
								Textiles	4%	1	24%	50%	0	0	0	1	
								Food waste	11%	2	15%	87%	0	0	1	2	
								Wood	13%	2	43%	23%	0	0	1	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	

Table B-10
2020 BAU Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Boatyards ¹⁰	Boatyards	Manufacturing - Industrial / Machinery	264	employees	400	lb/ employee	53	Paper/cardboard	37%	19	40%	43%	2	0	11	20	25
								Textiles	6%	3	24%	50%	0	0	1	2	
								Food waste	3%	2	15%	87%	0	0	1	1	
								Wood	9%	5	43%	23%	0	0	2	3	
								Garden and Park waste	4%	2	20%	28%	0	0	0	1	
	Office	Large Office Buildings	17	1,000 square feet	1,866	lb/ 1,000 square feet	16	Paper/cardboard	50%	8	40%	43%	1	0	4	8	10
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	18%	3	15%	87%	0	0	1	2	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	2	employees	1,719	lb/ employee	2	Paper/cardboard	32%	1	40%	43%	0	0	0	1	1
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	0	15%	87%	0	0	0	0	
								Wood	13%	0	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
Terminals	Office	Large Office Buildings	266	1,000 square feet	1,866	lb/ 1,000 square feet	248	Paper/cardboard	50%	125	40%	43%	11	3	71	129	165
								Textiles	6%	14	24%	50%	1	0	6	10	
								Food waste	18%	45	15%	87%	3	1	20	36	
								Wood	4%	10	43%	23%	1	0	3	6	
								Garden and Park waste	1%	1	20%	28%	0	0	0	1	
	Unrefrigerated Warehouse	Trucking & Warehousing	444	employees	3,800	lb/ employee	843	Paper/cardboard	35%	294	40%	43%	25	7	166	305	402
								Textiles	6%	50	24%	50%	3	1	20	36	
								Food waste	4%	34	15%	87%	2	1	14	26	
								Wood	14%	114	43%	23%	6	1	38	69	
								Garden and Park waste	2%	19	20%	28%	1	0	4	7	
	Refrigerated Warehouse	Trucking & Warehousing	295	employees	3,800	lb/ employee	561	Paper/cardboard	35%	196	40%	43%	17	4	111	202	267
								Textiles	6%	33	24%	50%	2	1	13	24	
								Food waste	4%	22	15%	87%	1	0	10	18	
								Wood	14%	76	43%	23%	4	1	25	46	
								Garden and Park waste	2%	13	20%	28%	0	0	2	4	
	Office/Unrefrigerated Warehouse/Cruise Ships	Services - Other Misc.	-	-	-	-	215	Paper/cardboard	33%	71	40%	43%	6	2	40	74	110
								Textiles	11%	23	24%	50%	1	0	9	17	
								Food waste	13%	27	15%	87%	2	0	12	21	
								Wood	3%	7	43%	23%	0	0	2	4	
								Garden and Park waste	7%	15	20%	28%	0	0	3	5	
Shipbuilding	-	Manufacturing - Industrial / Machinery	1,649	employees	400	lb/ employee	330	Paper/cardboard	37%	122	40%	43%	10	3	69	126	154
								Textiles	6%	20	24%	50%	1	0	8	14	
								Food waste	3%	10	15%	87%	1	0	4	8	
								Wood	9%	29	43%	23%	1	0	10	17	
								Garden and Park waste	4%	13	20%	28%	0	0	2	4	
	Office	Large Office Buildings	39	1,000 square feet	1,866	lb/ 1,000 square feet	36	Paper/cardboard	50%	18	40%	43%	2	0	10	19	24
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	7	15%	87%	0	0	3	5	
								Wood	4%	2	43%	23%	0	0	1	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	General Industrial	Manufacturing - Industrial / Machinery	8	employees	400	lb/ employee	2	Paper/cardboard	37%	1	40%	43%	0	0	0	1	1
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	3%	0	15%	87%	0	0	0	0	
								Wood	9%	0	43%	23%	0	0	0	0	
								Garden and Park waste	4%	0	20%	28%	0	0	0	0	
	Food Processing	Manufacturing - Food / Kindred	467	employees	3,200	lb/ slip	747	Paper/cardboard	36%	271	40%	43%	23	6	153	281	429
								Textiles	6%	43	24%	50%	3	1	17	31	
								Food waste	22%	167	15%	87%	11	3	72	131	
								Wood	7%	49	43%	23%	2	1	16	29	
								Garden and Park waste	1%	1	20%	28%	0	0	0	0	
	Lumber Yards	Manufacturing - Lumber & Wood Products	172	employees	6,200	lb/ employee	533	Paper/cardboard	16%	87	40%	43%	7	2	49	90	261
								Textiles	21%	109	24%	50%	7	2	43	79	
								Food waste	1%	7	15%	87%	0	0	3	5	
								Wood	35%	185	43%	23%	9	2	61	112	
								Garden and Park waste	1%	3	20%	28%	0	0	1	1	
Port	General Port Office	Large Office Buildings	39	1,000 square feet	8,050	lb/ 1,000 square feet	302	Paper/cardboard	50%	152	40%	43%	13	3	86	157	200
								Textiles	6%	17	24%	50%	1	0	7	12	
								Food waste	18%	55	15%	87%	4	1	24	43	
								Wood	4%	13	43%	23%	1	0	4	8	
								Garden and Park waste	1%	2	20%	28%	0	0	0	1	
	General Port Warehouse	Trucking & Warehousing	1,585	employees	3,800	lb/ employee	3,046	Paper/cardboard	35%	1,063	40%	43%	91	24	601	1100	1451
								Textiles	6%	180	24%	50%	11	3	71	131	
								Food waste	4%	122	15%	87%	8	2	52	96	
								Wood	14%	411	43%	23%	21	5	136	249	
								Garden and Park waste	2%	70	20%	28%	2	1	13	24	

Table B-10
2020 BAU Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Other Commercial ¹¹	Restaurant	Full-Service Restaurant	40	employees	4,403	lb/ employee	88	Paper/cardboard	17%	15	40%	43%	1	0	9	16	56
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	58	15%	87%	4	1	25	46	
								Wood	1%	1	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	73	employees	1,719	lb/ employee	63	Paper/cardboard	32%	2	40%	43%	0	0	1	3	30
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	1	
								Wood	13%	1	43%	23%	0	0	0	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Office	Large Office Buildings	-	-	-	-	2,562	Paper/cardboard	50%	2	40%	43%	0	0	1	2	1,702
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	1	15%	87%	0	0	0	1	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Other	Services - Other Misc.	237	spaces	556	lb/ space	66	Paper/cardboard	33%	22	40%	43%	2	0	12	23	34
								Textiles	11%	7	24%	50%	0	0	3	5	
								Food waste	13%	8	15%	87%	1	0	4	7	
								Wood	3%	2	43%	23%	0	0	1	1	
								Garden and Park waste	7%	5	20%	28%	0	0	1	2	
Other Industrial ¹²	-	Manufacturing - Industrial / Machinery	-	-	-	-	444	Paper/cardboard	37%	164	40%	43%	14	4	93	170	207
								Textiles	6%	27	24%	50%	2	0	11	19	
								Food waste	3%	13	15%	87%	1	0	6	10	
								Wood	9%	39	43%	23%	2	1	13	23	
								Garden and Park waste	4%	17	20%	28%	0	0	3	6	
	-	Trucking & Warehousing	10	employees	3800	lb/ employee	19	Paper/cardboard	35%	7	40%	43%	1	0	4	7	9
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	4%	1	15%	87%	0	0	0	1	
								Wood	14%	3	43%	23%	0	0	1	2	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
Total																	20,439

Notes:

1. Since waste data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego. See previous tables for the conversion of square footage into number of employees.
2. When not provided by the Port of San Diego or tenants, the Waste Disposal Factor is based on California Integrated Waste Management Board waste disposal data. See previous tables for details.
3. The Percent of Waste Profile for each degradable waste type is the fraction of the total waste disposed. See previous tables for details.
4. The Percent Degradable Organic Carbon (DOC) is the fraction of degradable carbon in each degradable waste type. Data for percent DOC is based on IPCC Guidelines. See previous tables for details.
5. The Percent Degradable Anaerobic Fraction (DANF) is the fraction of each degradable waste type that is capable of decomposition in anaerobic conditions. Data for percent DANF is based on California Air Resources Board data. See previous tables for details.
6. Represents the total carbon dioxide emissions plus methane emissions converted to carbon dioxide equivalents by a global warming potential factor of 21 based on CCAR 2009. Emission estimates follow CalEEMod guidance and account for an oxidation efficiency of methane of 10%, a destruction efficiency of landfill gas of 98%, and a collection efficiency of landfill gas of 80% per the San Diego County GHG Inventory.
7. Other than the land uses defined in this table, waste from these facilities was assumed to be minimal.
8. Yacht club and marina emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
9. Sport fishing and Commercial Sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
10. Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
11. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative waste data.
12. Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative waste data.

Abbreviations:

BAU - Business-As-Usual
 CCAR - California Climate Action Registry
 CO₂ - carbon dioxide
 CO₂e - carbon dioxide equivalent
 DANF - Degradable anaerobic fraction
 DOC - Degradable Organic Carbon
 GHG - Greenhouse gases
 lb - pound
 IPCC - Intergovernmental Panel on Climate Change

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
 CalEEMod. California Emissions Estimator Model. Available online at: <http://www.caleemod.com/>
 San Diego County Greenhouse Gas Inventory. September 2008. Prepared by the University of San Diego and EPIC. Available online at: <http://www.sandiego.edu/epic/ghginventory/>

Table B-11
2020 BAU Inventory
Emissions from Maritime Activities
San Diego Unified Port District

Sector	2006	2020 Projections
	Total Emissions (metric tons CO ₂ e/yr)	
Ocean Going Vessels ¹	55,162	72,786
Cargo Handling Equipment ²	4,039	6,109
Commercial Harbor Craft	20,835	22,315
Locomotive ²	3,085	4,666
Heavy Duty Vehicles ²	29,343	44,384
Cruise Terminal Transportation ³	3,830	4,213
Total	116,294	154,472

Notes:

1. Per the San Diego Unified Port District Maritime Business Plan, cargo activity was projected to grow an average of 3% annually across all types of cargo, therefore emissions from ocean going vessels, excluding harbor craft, were assumed to grow 3% annually, through 2020. Cruise ship activities were projected to grow 10% from 2006 to 2020.
2. Cargo handling equipment, assist tugs, ocean tugboats, locomotive, and heavy duty vehicle emissions are expected to increase in proportion to the cargo activity, since these are all supporting services.
3. Cruise terminal transportation emissions are expected to increase in proportion to the cruise ship activity, since it is a supporting service.

Abbreviations:

BAU - Business-As-Usual
CO₂e - carbon dioxide equivalent
GHG - Greenhouse gases
LCFS - Low Carbon Fuel Standard
yr - year

Sources:

California Air Resources Board (CARB). Ocean-going Vessels - Fuel Rule. Available online at:
<http://www.arb.ca.gov/ports/marinevess/ogv.htm>
California Air Resources Board (CARB). Shore Power for Ocean-going Vessels. Available online at:
<http://www.arb.ca.gov/ports/shorepower/shorepower.htm>
San Diego Unified Port District Maritime Business Plan. December 2008. Figure 4.4-1 Cargo Projections, Current Markets
The Port of San Diego 2006 Emissions Inventory. March 2008. Prepared by Starcrest Consulting Group, LLC.
Available online at: http://sandiegohealth.org/port/2006_emissions_inventory_final.pdf

Table C-1
2020 Inventory
Electricity and Natural Gas Emissions - Land Use Based Metric
San Diego Unified Port District

Tenant Type	Building Type ¹	CEUS Category Mapping	Activity Data ² (SF)	Electricity Energy Intensity ² (kWh/SF/yr)	Natural Gas Energy Intensity ² (therm/SF/yr)	Electricity Usage (kWh)	Natural Gas Usage (therm)	Electricity Emission Factor ³ (lb CO ₂ e/MWh)	Natural Gas Emission Factor ³ (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Retail	66,517	15.49	0.024	1,030,350	1,624			269
Retail - 2008 T24	-	Retail	11,701	14.05	0.023	164,392	269			43
Office	-	All Office	37,177	16.40	0.242	609,684	9,002			202
Restaurant	-	Restaurant	224,499	43.73	1.768	9,817,202	396,952			4,589
Restaurant - 2005 T24	-	Restaurant	4,351	42.56	1.767	185,175	7,689			88
Restaurant - 2008 T24	-	Restaurant	37,001	41.37	1.763	1,530,594	65,219			733
Lodging	Rooms	Lodging	5,086,542	16.10	0.617	81,912,785	3,140,894			37,377
	Rooms - 2005 T24	Lodging	1,028,487	15.40	0.616	15,842,665	633,547			7,368
	Rooms - 2008 T24	Lodging	3,267,801	14.61	0.609	47,743,725	1,988,617			22,626
	Restaurant	Restaurant	262,100	43.73	1.768	11,461,457	463,437			5,357
	Restaurant - 2005 T24	Restaurant	33,000	42.56	1.767	1,404,450	58,319			665
	Restaurant - 2008 T24	Restaurant	152,770	41.37	1.763	6,319,510	269,277			3,027
	Meeting Area	All Office	537,900	16.40	0.242	8,821,190	130,350			2,919
	Meeting Area - 2008 T24	All Office	490,667	15.00	0.210	7,360,481	103,265			2,407
	Retail	Retail	13,450	15.49	0.024	208,340	328			54
	Retail - 2008 T24	Retail	265,579	14.05	0.023	3,731,221	6,110			974
	Office	All Office	17,081	16.40	0.242	280,117	4,136			93
	Warehouse/Storage	Unrefrigerated Warehouse	115,968	4.54	0.021	526,412	2,416			146
Museums	Museum	Miscellaneous	1,931	9.72	0.124	18,767	240			6
	Office	All Office	200	16.40	0.242	3,280	48			1
	Retail	Retail	11,200	15.49	0.024	173,488	273			45
	Restaurant	Restaurant	7,000	43.73	1.768	306,105	12,377			143
Classrooms	Classrooms, Offices, Lockers - 2008 T24	Miscellaneous	4,663	9.02	0.118	42,074	550			14
Rental Car	Retail	Retail	52,332	15.49	0.024	810,621	1,278			211
Yacht Clubs	Car Wash	Unrefrigerated Warehouse	6,108	4.54	-	27,726	-			7
	General Building	Miscellaneous	97,934	-	0.124	-	12,150			65
	General Building - 2008 T24 Standards	Miscellaneous	5,000	-	0.118	-	590	556.29	11.73	3
	Restaurant	Restaurant	5,332	43.73	1.768	233,175	9,428			109
Marinas	General Building	Miscellaneous	142,641	-	0.124	-	17,696			94
	General Building - 2005 T24	Miscellaneous	5,468	-	0.123	-	673			4
	General Building - 2008 T24	Miscellaneous	10,000	-	0.118	-	1,180			6
	Office	All Office	32,120	16.40	0.242	526,746	7,778			174
	Retail	Retail	4,163	15.49	0.024	64,485	102			17
	Restaurant	Restaurant	19,679	43.73	1.768	860,549	34,796			402
Sport fishing	General Building	Miscellaneous	6,991	-	0.124	-	867			5
	Restaurant	Restaurant	1,409	43.73	1.768	61,615	2,491			29
Commercial Sport fishing	General Building	Miscellaneous	17,403	-	0.124	-	2,159			11
	Office	All Office	13,152	16.40	0.242	215,680	3,185			71
Excursions	Retail	Retail	4,100	15.49	0.024	63,509	100			17
	Retail	Retail	1,241	15.49	0.024	19,223	30			5
Petroleum	Restaurant	Restaurant	1,600	43.73	1.768	69,967	2,829			33
	Office	All Office	2,055	16.40	0.242	33,701	498			11
Boatyards	Retail	Retail	15,338	15.49	0.024	237,585	374			62
	Office	All Office	16,886	16.40	0.242	276,919	4,089			92
Terminal Tenants	Retail	Retail	1,000	15.49	0.024	15,490	24			4
	Office	All Office	266,100	16.40	0.242	4,363,857	64,435			1,444
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	433,143	4.54	0.021	1,966,160	9,024			544
	Car Wash	Unrefrigerated Warehouse	8,701	4.54	-	39,496	-			10
Industrial	Refrigerated Warehouse	Refrigerated Warehouse	288,000	35.31	0.071	10,169,519	20,502			2,675
	Office	All Office	38,913	16.40	0.242	638,138	9,422			211
	Miscellaneous	Miscellaneous	301,021	9.72	0.124	2,925,528	37,345			937
Other Commercial ⁴	Refrigerated Warehouse	Refrigerated Warehouse	60,311	35.31	0.071	2,129,614	4,293			560
			-			1,554,136	30,528			555
Total										97,511

Notes:

1. Since CEUS data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego.
2. Electricity and natural gas intensities are derived from the 2006 California Commercial End-Use Survey (CEUS), performed by Itron under contract to the California Energy Commission (CEC). Energy usage rates are based on 2002 consumption data, unless they are designated as 2005 T24 or 2008 T24 (under Tenant/Building Type), in which case they are adjusted to reflect the energy intensities equivalent to meeting 2005 and 2008 Title 24 standards, respectively. Adjustments to reflect 2005 and 2008 T24 standards were made per data provided in CEC Impact Analysis reports (CEC 2003, CEC 2007). ENVIRON used data for San Diego Gas & Electric, Zone 13, which is the sector in which the Port of San Diego is located.
3. See previous tables for the calculation of the electricity and natural gas emission factors.
4. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative CEUS data.

Abbreviations:

CEC - California Energy Commission
CEUS - California Commercial End-Use Survey
CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MWh - megawatt-hour
SF - square feet
T24 - Title 24
yr - year

Sources:

California Energy Commission. 2006. California Commercial End-Use Survey. Prepared by Itron Inc. Available at: <http://www.energy.ca.gov/ceus/>
California Energy Commission. 2003. Impact Analysis: 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Available at: http://www.energy.ca.gov/title24/2005standards/archive/rulemaking/documents/2003-07-11_400-03-014.PDF
California Energy Commission. 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Available at: http://www.energy.ca.gov/title24/2008standards/rulemaking/documents/2007-11-07_IMPACT_ANALYSIS.PDF

Table C-2
2020 Inventory
Electricity and Natural Gas Emissions - Other Metrics
San Diego Unified Port District

Tenant Type	Energy Source	Activity Data ¹ (Unit)	Unit	Energy Intensity	Units	Energy Usage	Units	Electricity Emission Factor ² (lb CO ₂ e/MWh)	Natural Gas Emission Factor ² (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
Port ³	Electricity	-				10,905,642	kWh	556.29	11.73	2,804
	Natural Gas	-				63,119	therm			342
Yacht Clubs ⁴	Electricity	2,337	Slips	3,125	(kWh/unit/yr)	7,303,125	kWh			1,843
Marinas ⁴	Electricity	5,410	Slips			16,906,250				4,266
Sport fishing ⁴	Electricity	75	Slips			234,375				59
Commercial Sportfishing ⁴	Electricity	125	Slips			390,625				99
Boatyards ⁵	Electricity	1,275,429	SF	2.44	(kWh/unit/yr)	3,108,438	kWh			784
	Natural Gas	1,275,429	SF	0.002	(therm/unit/yr)	2,227	therm			12
Shipbuilding ⁶	Electricity	4,639,831	SF	56.76	(kWh/unit/yr)	263,367,151	kWh			66,455
	Natural Gas	4,639,831	SF	0.001	(therm/unit/yr)	5,265	therm			28
Other Commercial ⁷	Electricity	-				29,232,895	kWh			7,376
	Natural Gas	-				318,755	therm			1,696
Other Industrial ⁸	Electricity	-				24,647,874	kWh			6,219
Total										91,983

Notes:

- Activity data was provided by the Port of San Diego.
- See previous tables for the calculation of the electricity and natural gas emission factors.
- Emissions due to Port electricity and natural gas use were derived from data provided by the Port of San Diego.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CO₂e - carbon dioxide equivalent
 kWh - kilowatt-hour
 lb - pound
 MWh - megawatt-hour
 SF - square feet

Table C-3
2020 Inventory
Stationary Combustion (Natural Gas) Emissions
San Diego Unified Port District

Tenant Type	Fuel Use	Usage	Units	Emission Factors ¹ (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
CP Kelco ²	General Stationary Combustion, Cogeneration (Natural Gas)	-			95,833
Other Industrial ³	General Stationary Combustion	2,699,865	therms	11.71	14,340
Total					110,173

Notes:

1. Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
2. Emissions from CP Kelco were reported to CARB in 2008. These emissions are assumed to be representative of year 2020.
3. Other Industrial includes industrial tenants who did not report to CARB. Emissions were calculated based on data provided by the tenants.

Abbreviations

CARB - California Air Resources Board
 CCAR - California Climate Action Registry
 CO₂e - carbon dioxide equivalent
 lb - pound

Sources:

California Air Resources Board. Mandatory Greenhouse Gas Reporting. Available online at: http://arb.ca.gov/cc/reporting/ghg-rep/regulation/2010_regulation.htm

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table C-4
2020 Inventory
Stationary Combustion (Diesel) Emissions
San Diego Unified Port District

Tenant Type	Fuel Use	Usage	Units	Emission Factors ¹ (lb CO ₂ e/unit)	Total Emissions (metric tons CO ₂ e/yr)
Port Events ²	General Stationary Combustion	413	gallons	22.46	4
Other Commercial ³	General Stationary Combustion	249	gallons		3
Other Industrial ⁴	General Stationary Combustion	68,934	gallons		702
Total					709

Notes:

1. Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
2. Diesel stationary combustion from Port events is solely from generators. Data was provided by the Port of San Diego.
3. Other Commercial includes commercial tenants with diesel stationary combustion. Emissions were calculated based on data provided by tenants.
4. Other Industrial includes industrial tenants with diesel stationary combustion. Emissions were calculated based on data provided by tenants.

Abbreviations

CCAR - California Climate Action Registry

CO₂e - carbon dioxide equivalent

kWh - kilowatt-hour

lb - pound

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at:
http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table C-5
2020 Inventory
Emissions from Water Use - Land Use Based Metric
San Diego Unified Port District

Tenant Type	Building Type ¹	Land use Mapping	Activity Data ¹ (Unit)	Unit	Indoor Water Usage Factor ² (Gallons/Unit/yr)	Outdoor Water Usage Factor ² (Gallons/Unit/yr)	Indoor Water Usage (MG/yr)	Outdoor Water Usage (MG/yr)	Indoor Water Energy Intensity ³ (kWh/MG)	Outdoor Water Energy Intensity ³ (kWh/MG)	Electricity Usage (kWh)	Electricity Emission Factor ⁴ (lb CO ₂ e/MWh)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Strip Mall	112	employee	21,204	12,996	2.37	1.46			47,098		12
Office	-	General Office Building	150	employee	17,717	10,859	2.66	1.63			52,703		13
Restaurant	-	High turnover (sit down restaurant)	687	employee	56,048	3,578	38.50	2.46			528,715		133
Lodging ⁵	Occupied Rooms	Hotel	8,927	occupied rooms	38,435	4,271	343.11	38.12			4,891,606		1,234
	Restaurant	Quality Restaurant	1,156	employee	56,048	3,578	64.79	4.14			889,658		224
	Meeting Area	General Office Building	4,132	employee	17,717	10,859	73.20	44.87			1,451,791		366
	Retail	Strip Mall	398	employee	21,204	12,996	8.44	5.17			167,366		42
	Office	General Office Building	69	employee	17,717	10,859	1.22	0.75			24,243		6
Warehouse/Storage		Unrefrigerated Warehouse	119	employee	797,340	0	94.88	0.00			1,235,572		312
Museums	Museum	Government Office Building	10	employee	18,972	11,628	0.19	0.12			3,763		1
	Office	General Office Building	1	employee	17,717	10,859	0.02	0.01			351		0.1
	Retail	Strip Mall	16	employee	21,204	12,996	0.34	0.21			6,728		2
	Restaurant	High turnover (sit down restaurant)	19	employee	56,048	3,578	1.06	0.07			14,622		4
Classrooms	Classrooms, Offices, Lockers	Elementary School	63	student	2,424	6,234	0.15	0.39			6,352		2
Rental Car	Retail	Strip Mall	75	employee	21,204	12,996	1.59	0.97			31,539		8
Yacht Clubs	Restaurant	Quality Restaurant	14	employee	56,048	3,578	0.78	0.05			10,774		3
Marinas	Office	General Office Building	129	employee	17,717	10,859	2.29	1.40			45,325		11
	Retail	Strip Mall	6	employee	21,204	12,996	0.13	0.08			2,523		1
	Restaurant	High turnover (sit down restaurant)	51	employee	56,048	3,578	2.86	0.18			39,250		10
Sport fishing	Restaurant	High turnover (sit down restaurant)	4	employee	56,048	3,578	0.22	0.01			3,078		1
Commercial Sport fishing	Office	General Office Building	53	employee	17,717	10,859	0.94	0.58			18,622		5
	Retail	Strip Mall	6	employee	21,204	12,996	0.13	0.08			2,523		1
Excursions	Retail	Strip Mall	2	employee	21,204	12,996	0.04	0.03			841		0.2
	Restaurant	High turnover (sit down restaurant)	5	employee	56,048	3,578	0.28	0.02			3,848		1
Petroleum	Gas Station	Gasoline/Service Station	14	employee	21,204	12,996	0.30	0.18			5,887		1
	Office	General Office Building	9	employee	17,717	10,859	0.16	0.10			3,162		1
	Retail	Strip Mall	9	employee	21,204	12,996	0.19	0.12			3,785		1
Boatyards	Office	General Office Building	68	employee	17,717	10,859	1.20	0.74			23,892		6
	Retail	Strip Mall	2	employee	21,204	12,996	0.04	0.03			841		0.2
Port Buildings	Office	General Office Building	12	employee	17,717	10,859	0.21	0.13			4,216		1
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	37	employee	797,340	0	29.50	0			384,169		97
Terminal Tenants ⁶	Office	General Office Building	97	employee	17,717	10,859	1.72	1.05			34,081		9
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	157	employee	797,340	0	125.18	0			1,630,125		411
Shipbuilding	Heavy Industry	General Heavy Industry	1,649	employee	797,340	0	1,314.81	0			17,121,500		4,320
	Office	General Office Building	157	employee	17,717	10,859	2.78	1.70			55,162		14
Industrial	Light Industry	General Light Industry	500	employee	797,340	0	398.67	0			5,191,480		1,310
	Heavy Industry	General Heavy Industry	115	employee	797,340	0	91.69	0			1,194,040		301
Other Commercial ⁷	-	-	-	-	-	-	12.05	1.27			170,933.0		43
Total													8,908

Notes:

1. Since water usage data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego. See previous tables for the conversion of square footage into number of employees.
2. ENVIRON used data from the Pacific Institute's "Waste Not Want Not" report and US Census Data to estimate the amount of water used at each land use type. See previous tables for details.
3. ENVIRON used energy intensities for indoor and outdoor water use for Southern California from California Energy Commission 2006 Report, *Refining Estimates of Water-Related Energy Use in California*. This includes energy used for water supply and conveyance, treatment, distribution, and wastewater treatment (for indoor water). See previous tables for details.
4. See previous tables for the calculation of the electricity emission factor.
5. The water use rate for lodging is per occupied room, therefore an average occupancy rate for year 2006 (assumed to be the same in future years) in San Diego County was used to estimate the number of *occupied* rooms. The average occupancy rate is from the San Diego Convention & Visitors Bureau.
6. Terminal tenants only include those who are not on the Port water meters. See later tables for the inclusion of Port water use.
7. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative water usage rates.

Abbreviations

CEC - California Energy Commission
CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MG - million gallons of water
MWh - megawatt-hour
yr - year

Sources:

California Energy Commission. 2006. Refining Estimates of Water Related Energy Use in California. CEC-500-2006-118. Available at: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>
Pacific Institute (Gleick, P.H.; Haasz, D.; Henges-Jeck, C.; Srinivasan, V.; Cushing, K.K.; Mann, A.) 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California. Available at: http://www.pacinst.org/reports/urban_usage/
San Diego Convention & Visitors Bureau. San Diego County Visitor Industry Summary for 2006. <http://www.sandiego.org/nav/Visitors>
US Census Bureau. 2000 Census. Table QT-H1: General Housing Characteristics 2000. Available online at: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>

Table C-6
2020 Inventory
Emissions from Water Use - Other Metrics
San Diego Unified Port District

Tenant Type	Activity Data ¹ (Unit)	Unit	Indoor Water Usage Factor (Gallons/Unit/yr)	Outdoor Water Usage Factor (Gallons/Unit/yr)	Indoor Water Usage (MG/yr)	Outdoor Water Usage (MG/yr)	Indoor Water Energy Intensity ² (kWh/MG)	Outdoor Water Energy Intensity ² (kWh/MG)	Electricity Usage (kWh)	Electricity Emission Factor ³ (lb CO ₂ e/MWh)	Total Emissions (metric tons CO ₂ e/yr)
Port ⁴		-			192	-			2,505,852		632
Boatyards ⁵	1,275,429	SF	36	-	45.7	-			595,604		150
Rental Car ⁶	687,150	cars	-	27	-	19			206,143		52
Yacht Clubs ⁷	2,337	Slips				2			25,155		6
Marinas ⁷	5,410	Slips				5			58,232		15
Sport fishing ⁷	75	Slips				0.1			807		0.2
Commercial Sport fishing ⁷	125	Slips				0.1			1,345		0.3
Terminal Tenant Car Wash ⁶	978,863	cars	-	27	-	26			293,656		74
Other Commercial ⁸		-			46	130.4			2,050,509		517
Other Industrial ⁹		-			16	-			202,287		51
										Total	1,499

Notes:

- Activity data was provided by the Port of San Diego.
- ENVIRON used energy intensities for indoor and outdoor water use for Southern California from California Energy Commission 2006 Report, *Refining Estimates of Water-Related Energy Use in California*. This includes energy used for water supply and conveyance, treatment, distribution, and wastewater treatment (for indoor water). See previous tables for details.
- See previous tables for the calculation of the electricity emission factor.
- Port includes water use from Port owned and operated buildings, National City Marine Terminal (NCMT), Tenth Avenue Marine Terminal (TAMT) (with the exclusion of some tenants who are on their own water meter), and the Cruise Ship Terminal (CST).
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Water use from car washes was calculated based on a metric developed from participating representative tenants to calculate the number of cars washed annually. Average water use per car wash is from the International Car Wash association; the mean value from conveyor car washes was used.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CEC - California Energy Commission
CO₂e - carbon dioxide equivalent
CST - Cruise Ship Terminal
kWh - kilowatt-hour
lb - pound
MG - million gallons of water
MWh - megawatt-hour
NCMT - National City Marine Terminal
SF - square feet
TAMT - Tenth Avenue Marine Terminal
yr - year

Source:

California Energy Commission. 2006. *Refining Estimates of Water Related Energy Use in California*. CEC-500-2006-118. Available at: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>
International Car Wash Association. *Water Use in the Professional Car Wash Industry*. 2002. Available online at: <http://www.carwash.org/operatorinformation/research/Pages/EnvironmentalReports.aspx>

Table C-7
2020 Inventory
On-Road Transportation - VMT/Trip Based Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Trip Generation Mapping	Trip Length Mapping	Activity Data ¹	units	Trip Generation Rate ²	units/day	Vehicle Trips per yr ³	Trip Length (miles) ⁴	Yearly VMT	Fleet wide Running Emission Factor ⁵ (g/VMT)	Fleet wide Starting/Idling Emission Factor ⁶ (g/trip)	Annual Emissions ⁴ (metric tons CO ₂ e/yr)
Retail	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	78	1,000 sq ft	40	trips/1,000 sq ft	1,141,987	4.3	4,910,545	378	64	2,031
Office	Office	Standard Commercial Office	Office	37	1,000 sq ft	20	trips/1,000 sq ft	271,395	8.8	2,388,276			969
Restaurant	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	266	1,000 sq ft	130	trips/1,000 sq ft	12,614,642	4.7	59,288,818			24,443
Lodging ⁷	Lodging	Hotel (w/convention facilities/restaurant)	Lodging	8,927	occupied rooms	10	trips/occupied room	32,584,306	7.6	247,640,722			100,734
Warehouse/Storage	Warehouse	Warehousing	Industrial Plant	116	1,000 sq ft	5	trips/1,000 sq ft	211,642	11.7	2,476,207			1,000
Museums	Museum	Government Office (Civic Center)	Government Office	2	1,000 sq ft	30	trips/1,000 sq ft	21,144	6	126,867			52
	Office	Standard Commercial Office	Office	0.2	1,000 sq ft	20	trips/1,000 sq ft	1,460	8.8	12,848			5
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	11	1,000 sq ft	40	trips/1,000 sq ft	163,520	4.3	703,136			291
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	7	1,000 sq ft	130	trips/1,000 sq ft	332,150	4.7	1,561,105			644
Classrooms	Elementary School	Elementary School	Elementary School	5	1,000 sq ft	39	trips/1,000 sqft	66,378	3.4	225,685			94
Yacht Club	Restaurant	Restaurant: Quality	Restaurant	5	1,000 sq ft	100	trips/1,000 sq ft	194,627	4.7	914,746			377
	Slips	Marinas	Marinas	2,337	slips	4	trips/berth	3,412,020	6.3	21,495,726			8,783
Marinas	Office	Standard Commercial Office	Office	32	1,000 sq ft	20	trips/1,000 sq ft	234,476	8.8	2,063,389			837
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	4	1,000 sq ft	40	trips/1,000 sq ft	60,780	4.3	261,353			108
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	20	1,000 sq ft	130	trips/1,000 sq ft	933,769	4.7	4,388,712			1,809
	Slips	Marinas	Marinas	5,410	slips	4	trips/berth	7,898,600	6.3	49,761,180			20,333
Sport fishing	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	1	1,000 sq ft	130	trips/1,000 sq ft	66,857	4.7	314,228			130
	Slips	Marinas	Marinas	75	slips	4	trips/berth	109,500	6.3	689,850			282
Commercial Sport fishing	Office	Standard Commercial Office	Office	13	1,000 sq ft	20	trips/1,000 sq ft	96,008	8.8	844,872			343
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	4	1,000 sq ft	40	trips/1,000 sq ft	59,860	4.3	257,398			106
	Slips	Marinas	Marinas	247	slips	4	trips/berth	360,620	6.3	2,271,906			928
Excursions	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	1	1,000 sq ft	40	trips/1,000 sq ft	18,119	4.3	77,910			32
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	2	1,000 sq ft	130	trips/1,000 sq ft	75,920	4.7	356,824			147
Petroleum	Office	Standard Commercial Office	Office	2	1,000 sq ft	20	trips/1,000 sq ft	15,002	8.8	132,013			54
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	6	1,000 sq ft	40	trips/1,000 sq ft	88,432	4.3	380,258			157
	Fueling Stations	Gasoline Station with food mart	Gasoline with Food Mart	2	stations	865	trips/station	631,731	2.8	1,768,846			747
Open Space		Park: Developed	Parks	187	acres	50	trips/acre	3,413,978	5.4	18,435,483			7,566
	Boatyard	Manufacturing/Assembly	Industrial Plant	29	acres	50	trips/acre	534,357	11.7	6,251,973			2,524
Boatyards	Office	Standard Commercial Office	Office	17	1,000 sq ft	20	trips/1,000 sq ft	123,268	8.8	1,084,757			440
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	1	1,000 sq ft	40	trips/1,000 sq ft	14,600	4.3	62,780			26
Terminal Tenants	Office	Standard Commercial Office	Office	273	1,000 sq ft	20	trips/1,000 sq ft	1,990,615	8.8	17,517,413			7,104
	Unrefrigerated Warehouse	Warehousing	Industrial Plant	544	1,000 sq ft	5	trips/1,000 sq ft	993,587	11.7	11,624,963			4,692
Port Offices	Refrigerated Warehouse	Warehousing	Industrial Plant	288	1,000 sq ft	5	trips/1,000 sq ft	525,600	11.7	6,149,520			2,482
	Office	Standard Commercial Office	Office	260	1,000 sq ft	20	trips/1,000 sq ft	1,895,014	8.8	16,676,124			6,763
Port Warehouses		Warehousing	Industrial Plant	946	1,000 sq ft	5	trips/1,000 sq ft	1,726,635	11.7	20,201,632			8,154
Shipbuilding	Manufacturing/Assembly	Industrial Plant	Industrial Plant	107	acres	50	trips/acre	1,943,915	11.7	22,743,800			9,181
	Office	Standard Commercial Office	Office	39	1,000 sq ft	20	trips/1,000 sq ft	284,061	8.8	2,499,739			1,014
Industrial Tenants	Refrigerated Warehouse	Warehousing	Industrial Plant	39	1,000 sq ft	5	trips/1,000 sq ft	71,015	11.7	830,879			335
	Other Tenants	Manufacturing/Assembly	Industrial Plant	64	acres	50	trips/acre	1,165,577	11.7	13,637,253			5,505
Rental Car ⁸	-	-	-	-	-	-	-	280,320	15.2	4,259,637	1.166	26	5,234
Events ⁹	-	-	-	-	-	-	-	342,150	5.4	1,847,610	378	64	758
Other Commercial ¹⁰	-	-	Parks	-	-	-	-	8,519,279	8.3	70,943,867			28,803
Total													256,017

Notes:

1. Since trip data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was provided for each building type by the Port of San Diego.
2. The Trip Generation Rate represents the total number of trips (one-way trips) that are generated by a site with the given land use. Trip generation rates are from the San Diego Municipal Code, Land Development Code, Trip Generation Manual (May 2003) and the SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002). See previous tables for details.
3. Annual vehicle trips are calculated assuming the weekday trip rate applies during the weekend (assuming 365 days per year of weekday travel rates).
4. Trip lengths are from SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002) and represent average weighted trip lengths for all trips to and from the general land use site. See previous tables for details.
5. The fleet wide running and starting emission factors are calculated from EMFAC2007 for San Diego County for year 2020 and include reductions due to Pwley and CFS standards. See previous tables for calculation details.
6. CO₂e/CO₂/0.95: The United States Environmental Protection Agency (USEPA) recommends assuming that CH₄, N₂O, and HFCs are 5% of emissions on a CO₂e basis.
7. The trip rate for lodging is per occupied room, therefore an average occupancy rate for year 2006 (assumed to be the same in future years) in San Diego County was used to estimate the number of occupied rooms. The average occupancy rate is from the San Diego Convention & Visitors Bureau.
8. Rental car bus trips were calculated based on a metric developed from participating representative tenants. Emissions factors are for the EMFAC vehicle class 'Other Bus'.
9. Event data, including attendees, was provided by the Port of San Diego. Each attendee was conservatively assumed to drive their own car to and from the event. Trip length data was assumed to be equal to that of parks, as all events are held in the parks.
10. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative trip data.

Abbreviations:

CH₄ - methane
CO₂ - carbon dioxide
CO₂e - carbon dioxide equivalent
g - gram
HFC - hydrofluorocarbons
N₂O - nitrous oxide
SANDAG - San Diego Association of Governments
sq ft - square feet
USEPA - United States Environmental Protection Agency
VMT - vehicle miles traveled
yr - year

Sources:

San Diego Convention & Visitors Bureau. San Diego County Visitor Industry Summary for 2006. <http://www.sandiego.org/nav/Visitors>
San Diego Municipal Code, Land Development Code, Trip Generation Manual. May 2003. Available online at: <http://www.sandiego.gov/planning/pdf/tripmanual.pdf>
SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region. April 2002. Available online at: http://www.sandag.org/uploads/publicationid/publicationid_1140_5044.pdf

Table C-8
2020 Inventory
On-Road Transportation - Fuel Based Emissions
San Diego Unified Port District

Tenant Type	Fuel	Activity Data ¹ (Unit)	Unit	Fuel Intensity (gal/unit/yr)	Fuel Usage (gallons)	Emission Factors ² (lb CO ₂ e/gallon)	Total Emissions (metric tons CO ₂ e/yr)
Port On-Road ³				-			739
Rental Car ⁴	Gasoline		-		1,558,314	14.88	10,515
Boatyards ⁵	Gasoline	1,275,429	SF	0.03	40,633	15.45	285
	Gasoline			0.060	279,603	15.45	1,959
Shipbuilding ⁶	Diesel	4,639,831	SF	0.047	216,209	17.80	1,745
	LPG			0.029	133,665	13.87	841
Other Commercial ⁷	Gasoline			-			18
	Propane			-			120
Other Industrial ⁸	Diesel			-			5,032
Total							21,253

Notes:

- Activity data was provided by the Port of San Diego.
- Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
- Emissions due to Port on-road transportation were derived from data provided by the Port of San Diego.
- Emissions from rental cars are scaled from the San Francisco Airport Climate Action Plan, based on passenger count statistics for year 2006 (assumed to be representative for future years) for San Diego Airport and San Francisco International Airport. There are a total of 16 rental car agencies at the San Diego Airport, 4 of which are within the Port's jurisdiction, therefore the total rental car emissions are scaled by (4/16).
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards. This was assumed to be separate from commute/customer/vendor trips, which are quantified under the VMT based on-road emissions.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage. This was assumed to be separate from commute/customer/vendor trips, which are quantified under the VMT based on-road emissions.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CCAR - California Climate Action Registry
CO₂e - carbon dioxide equivalent
gal - gallon
lb - pound
LPG - liquefied petroleum gas
SF - square feet
VMT - vehicle miles traveled
yr - year

Sources:

Bureau of Transportation Statistics. T-100 Segment data for Airport Flight Data. http://www.transtats.bts.gov/Data_Elements.aspx?Data=2. Accessed January, 2011.

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

San Francisco International Airport. 2010. SFO Climate Action Plan. Available online at: <http://www.flysfo.com/web/page/about/green/index.html>. Accessed February, 2011.

San Diego International Airport Rental Car Agencies. http://www.san.org/sdia/transportation/car_rental.aspx. Accessed August, 2011.

Table C-9
2020 Inventory
Emissions from Off-road Equipment Use
San Diego Unified Port District

Tenant Type	Fuel	Activity Data ¹ (Unit)	Unit	Fuel Intensity (gal/unit/yr)	Fuel Usage (gallons)	Emission Factors ² (lb CO ₂ e/gallon)	Total Emissions (metric tons CO ₂ e/yr)
Port Off-road ³				-			532
Yacht Clubs ⁴	Gasoline	2,337	Slips	14	32,322	17.66	259
Marinas ⁴	Gasoline	5,410	Slips		74,823	17.66	599
Sportfishing ⁴	Gasoline	75	Slips		1,037	17.66	8
Commercial Sportfishing ⁴	Gasoline	247	Slips		3,416	17.66	27
Recreational Boating ⁵				-			106,165
Boatyards ⁶	Diesel	1,275,429	SF	0.041	52,823	20.34	487
	Propane			0.012	15,396	12.94	90
Shipbuilding ⁷	Diesel	4,639,831	SF	0.129	596,477	20.34	5,504
Lumber Yards ⁸	Diesel	954,603	-	0.042	39,966	20.34	369
	LPG		-	0.013	12,174	13.05	72
Other Commercial ⁹	Gasoline		-		12,592	18	101
Other Industrial ¹⁰	Diesel			-			57
Total							114,272

Notes:

- Activity data was provided by the Port of San Diego.
- Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
- Emissions due to Port off-road transportation were derived from data provided by the Port of San Diego.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- OFFROAD2007 was run for San Diego County for year 2020. The total emissions were scaled by the % of boating days spent on the Ocean versus the Delta, SF Bay, and Inland Lakes for residents within the South Coast over years 2007-2008 (California Boater Survey, July 2011). This assumption, in effect, adjusts the San Diego County boat population and activity to reflect only those boats which are active off of the coastline of San Diego County. The fleet mix and boating habits within San Diego County are assumed to be similar to that surveyed in the South Coast. Total emissions from boating activity in the ocean (off the San Diego County coastline) were then adjusted by the portion of slip area present within the Port of San Diego versus the slip area present within the San Diego County coastline. Emissions were adjusted to account for the Low Carbon Fuel Standard (LCFS), which is anticipated to decrease emissions by 10% by year 2020. LCFS is included in this analysis, recognizing that it is currently being challenged.
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Lumber yard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CARB - California Air Resources Board
 CCAR - California Climate Change Registry
 CO₂e - carbon dioxide equivalent
 gal - gallon
 lb - pound
 LCFS - Low Carbon Fuel Standard
 LPG - liquefied petroleum gas
 SF - square feet
 yr - year

Sources:

2007-2009 California Boater Survey. July 2011. Available online at: <http://www.coastal.ca.gov/ccbn/materialsforeducators.html>
 California Air Resources Board (CARB). 2006. Off-Road Emissions Inventory Program (OFFROAD2007). Available Online: <http://www.arb.ca.gov/msei/offroad/offroad.htm>
 California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table C-10
2020 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ¹	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Retail, Other Stores	112	employees	1,719	lb/ employee	96	Paper/cardboard	32%	31	40%	43%	3	1	17	32	46
								Textiles	4%	4	24%	50%	0	0	2	3	
								Food waste	11%	11	15%	87%	1	0	5	8	
								Wood	13%	12	43%	23%	1	0	4	7	
Office	-	Large Office Buildings	37	1,000 square feet	1,866	lb/ 1,000 square feet	35	Garden and Park waste	2%	2	20%	28%	0	0	0	1	23
								Paper/cardboard	50%	17	40%	43%	1	0	10	18	
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	6	15%	87%	0	0	3	5	
Restaurant	-	Full-Service Restaurant	687	employees	4,403	lb/ employee	1,512	Wood	4%	1	43%	23%	0	0	0	1	967
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
								Paper/cardboard	17%	262	40%	43%	22	6	148	271	
								Textiles	0%	6	24%	50%	0	0	2	4	
								Food waste	66%	1,000	15%	87%	65	17	429	785	967
								Wood	1%	9	43%	23%	0	0	3	6	
								Garden and Park waste	0%	2	20%	28%	0	0	0	1	
								Paper/cardboard	32%	5,135	40%	43%	439	115	2904	5313	
	Hotel - Rooms	Large Hotels	8,146	employees	3,903	lb/ employee	15,897	Textiles	4%	556	24%	50%	33	9	221	404	9836
								Food waste	36%	5,786	15%	87%	375	98	2483	4543	
								Wood	4%	588	43%	23%	29	8	195	357	
								Garden and Park waste	4%	668	20%	28%	19	5	123	225	
								Paper/cardboard	17%	440	40%	43%	38	10	249	456	1627
								Textiles	0%	10	24%	50%	1	0	4	7	
								Food waste	66%	1,682	15%	87%	109	29	722	1321	
								Wood	1%	15	43%	23%	1	0	5	9	
	Restaurant	Full-Service Restaurant	1,156	employees	4,403	lb/ employee	2,545	Garden and Park waste	0%	3	20%	28%	0	0	0	1	638
								Paper/cardboard	50%	483	40%	43%	41	11	273	499	
								Textiles	6%	54	24%	50%	3	1	21	39	
								Food waste	18%	176	15%	87%	11	3	75	138	
	Meeting Area	Large Office Buildings	1,029	1,000 square feet	1,866	lb/ 1,000 square feet	960	Wood	4%	40	43%	23%	2	1	13	24	165
								Garden and Park waste	1%	6	20%	28%	0	0	1	2	
								Paper/cardboard	32%	109	40%	43%	9	2	62	113	
								Textiles	4%	15	24%	50%	1	0	6	11	
	Retail	Retail, Other Stores	398	employees	1,719	lb/ employee	342	Food waste	11%	38	15%	87%	2	1	16	30	11
								Wood	13%	44	43%	23%	2	1	15	27	
								Garden and Park waste	2%	7	20%	28%	0	0	1	2	
								Paper/cardboard	50%	8	40%	43%	1	0	5	8	
	Office	Large Office Buildings	17	1,000 square feet	1,866	lb/ 1,000 square feet	16	Textiles	6%	1	24%	50%	0	0	0	1	108
								Food waste	18%	3	15%	87%	0	0	1	2	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
								Paper/cardboard	35%	79	40%	43%	7	2	45	82	5
								Textiles	6%	13	24%	50%	1	0	5	10	
								Food waste	4%	9	15%	87%	1	0	4	7	
								Wood	14%	31	43%	23%	2	0	10	19	
	Warehouse/Storage	Trucking & Warehousing	119	employees	3,800	lb/ employee	226	Garden and Park waste	2%	5	20%	28%	0	0	1	2	108
								Paper/cardboard	33%	3	40%	43%	0	0	2	3	
								Textiles	11%	1	24%	50%	0	0	0	1	
								Food waste	13%	1	15%	87%	0	0	0	1	
	Museum	Services - Other Misc.	10	employees	1,800	lb/ employee	9	Wood	3%	0	43%	23%	0	0	0	0	0.1
								Garden and Park waste	7%	0	20%	28%	0	0	0	0	
								Paper/cardboard	50%	0	40%	43%	0	0	0	0	
								Textiles	6%	0	24%	50%	0	0	0	0	
	Office	Large Office Buildings	0.20	1,000 square feet	1,866	lb/ 1,000 square feet	0	Food waste	18%	0	15%	87%	0	0	0	0	7
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
								Paper/cardboard	32%	4	40%	43%	0	0	2	5	
	Retail	Retail, Other Stores	16	employees	1,719	lb/ employee	14	Textiles	4%	1	24%	50%	0	0	0	0	27
								Food waste	11%	2	15%	87%	0	0	1	1	
								Wood	13%	2	43%	23%	0	0	1	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	19	employees	4,403	lb/ employee	42	Paper/cardboard	17%	0	40%	43%	1	0	4	7	7
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	28	15%	87%	2	0	12	22	
								Wood	1%	0	43%	23%	0	0	0	0	
	Classrooms	Elementary School	15	employees	1,800	lb/ employee	14	Garden and Park waste	0%	0	20%	28%	0	0	0	0	31
								Paper/cardboard	33%	4	40%	43%	0	0	3	5	
								Textiles	11%	1	24%	50%	0	0	1	1	
								Food waste	13%	2	15%	87%	0	0	1	1	
	Rental Car ²	Retail	75	employees	1,719	lb/ employee	64	Wood	3%	0	43%	23%	0	0	0	0	7
								Garden and Park waste	7%	1	20%	28%	0	0	0	0	
								Paper/cardboard	32%	20	40%	43%	2	0	12	21	
								Textiles	4%	3	24%	50%	0	0	1	2	
								Food waste	13%	7	15%	87%	0	0	3	6	31
								Wood	13%	8	43%	23%	0	0	3	5	
								Garden and Park waste	2%	1	20%	28%	0	0	0	0	
								Paper/cardboard	32%	20	40%	43%	2	0	12	21	

Table C-10
2020 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Yacht Clubs ⁸	Restaurant	Full-Service Restaurant	14	employees	4,403	lb/ employee	31	Paper/cardboard	17%	5	40%	43%	0	0	3	6	20
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	20	15%	87%	1	0	9	16	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Services - Other Misc.	2,337	slips	556	lb/ slip	649	Paper/cardboard	33%	216	40%	43%	18	5	122	223	331
								Textiles	11%	69	24%	50%	4	1	27	50	
								Food waste	13%	82	15%	87%	5	1	35	64	
								Wood	3%	21	43%	23%	1	0	7	13	
								Garden and Park waste	7%	46	20%	28%	1	0	8	16	
Marinas ⁸	Office	Large Office Buildings	32	1,000 square feet	1,866	lb/ 1,000 square feet	30	Paper/cardboard	50%	15	40%	43%	1	0	9	16	20
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	5	15%	87%	0	0	2	4	
								Wood	4%	1	43%	23%	0	0	0	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	6	employees	1,719	lb/ employee	5	Paper/cardboard	32%	2	40%	43%	0	0	1	2	2
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	0	
								Wood	13%	1	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	51	employees	4,403	lb/ employee	112	Paper/cardboard	17%	19	40%	43%	2	0	11	20	72
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	74	15%	87%	5	1	32	58	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Services - Other Misc.	5,410	slips	556	lb/ slip	1,503	Paper/cardboard	33%	499	40%	43%	43	11	282	516	767
								Textiles	11%	159	24%	50%	10	2	63	116	
								Food waste	13%	189	15%	87%	12	3	81	149	
								Wood	3%	48	43%	23%	2	1	16	29	
								Garden and Park waste	7%	107	20%	28%	3	1	20	36	
Sport fishing ⁸	Restaurant	Full-Service Restaurant	4	employees	4,403	lb/ employee	9	Paper/cardboard	17%	2	40%	43%	0	0	1	2	6
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	6	15%	87%	0	0	2	5	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Manufacturing - Food / Kindred	75	slips	1,692	lb/ slip	63	Paper/cardboard	36%	23	40%	43%	2	1	13	24	36
								Textiles	6%	4	24%	50%	0	0	1	3	
								Food waste	22%	14	15%	87%	1	0	6	11	
								Wood	7%	4	43%	23%	0	0	1	3	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Commercial Sport fishing ⁸	Office	Large Office Buildings	13	1,000 square feet	1,866	lb/ 1,000 square feet	12	Paper/cardboard	50%	6	40%	43%	1	0	3	6	8
								Textiles	6%	1	24%	50%	0	0	0	0	
								Food waste	18%	2	15%	87%	0	0	1	2	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	6	employees	1,719	lb/ employee	5	Paper/cardboard	32%	2	40%	43%	0	0	1	2	2
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	0	
								Wood	13%	1	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Slips	Manufacturing - Food / Kindred	247	slips	1,692	lb/ slip	209	Paper/cardboard	36%	76	40%	43%	6	2	43	78	120
								Textiles	6%	12	24%	50%	1	0	5	9	
								Food waste	22%	47	15%	87%	3	1	20	37	
								Wood	7%	14	43%	23%	1	0	4	8	
								Garden and Park waste	1%	1	20%	28%	0	0	0	0	
Excursions ⁷	Retail	Retail, Other Stores	2	employees	1,719	lb/ employee	2	Paper/cardboard	32%	1	40%	43%	0	0	0	1	1
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	0	15%	87%	0	0	0	0	
								Wood	13%	0	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	5	employees	4,403	lb/ employee	11	Paper/cardboard	17%	2	40%	43%	0	0	1	2	7
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	7	15%	87%	0	0	3	6	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
Petroleum ⁷	Office	Large Office Buildings	2	1,000 square feet	1,866	lb/ 1,000 square feet	2	Paper/cardboard	50%	1	40%	43%	0	0	1	1	1
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	0	15%	87%	0	0	0	0	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	22	employees	1,719	lb/ employee	19	Paper/cardboard	32%	6	40%	43%	1	0	3	6	9
								Textiles	4%	1	24%	50%	0	0	0	1	
								Food waste	11%	2	15%	87%	0	0	1	2	
								Wood	13%	2	43%	23%	0	0	1	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	

Table C-10
2020 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Boatyards ¹⁰	Boatyards	Manufacturing - Industrial / Machinery	264	employees	400	lb/ employee	53	Paper/cardboard	37%	19	40%	43%	2	0	11	20	25
								Textiles	6%	3	24%	50%	0	0	1	2	
								Food waste	3%	2	15%	87%	0	0	1	1	
								Wood	9%	5	43%	23%	0	0	2	3	
	Office	Large Office Buildings	17	1,000 square feet	1,866	lb/ 1,000 square feet	16	Garden and Park waste	4%	2	20%	28%	0	0	0	1	10
								Paper/cardboard	50%	8	40%	43%	1	0	4	8	
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	18%	3	15%	87%	0	0	1	2	
	Retail	Retail, Other Stores	2	employees	1,719	lb/ employee	2	Wood	4%	1	43%	23%	0	0	0	0	1
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
								Paper/cardboard	32%	1	40%	43%	0	0	0	1	
								Textiles	4%	0	24%	50%	0	0	0	0	
Terminals	Office	Large Office Buildings	266	1,000 square feet	1,866	lb/ 1,000 square feet	248	Food waste	6%	14	24%	50%	1	0	6	10	165
								Wood	18%	45	15%	87%	3	1	20	36	
								Wood	4%	10	43%	23%	1	0	3	6	
								Garden and Park waste	1%	1	20%	28%	0	0	0	1	
	Unrefrigerated Warehouse	Trucking & Warehousing	444	employees	3,800	lb/ employee	843	Paper/cardboard	35%	294	40%	43%	25	7	166	305	402
								Textiles	6%	50	24%	50%	3	1	20	36	
								Food waste	4%	34	15%	87%	2	1	14	26	
								Wood	14%	114	43%	23%	6	1	38	69	
	Refrigerated Warehouse	Trucking & Warehousing	295	employees	3,800	lb/ employee	561	Garden and Park waste	2%	19	20%	28%	1	0	4	7	267
								Paper/cardboard	35%	196	40%	43%	17	4	111	202	
								Textiles	6%	33	24%	50%	2	1	13	24	
								Food waste	4%	22	15%	87%	1	0	10	18	
	Office/Unrefrigerated Warehouse/Cruise Ships	Services - Other Misc.	-	-	-	-	215	Wood	14%	76	43%	23%	4	1	25	46	110
								Garden and Park waste	2%	13	20%	28%	0	0	2	4	
								Paper/cardboard	33%	71	40%	43%	6	2	40	74	
								Textiles	11%	23	24%	50%	1	0	9	17	
Shipbuilding	-	Manufacturing - Industrial / Machinery	1,649	employees	400	lb/ employee	330	Food waste	13%	27	15%	87%	2	0	12	21	154
								Textiles	3%	7	43%	23%	0	0	2	4	
								Garden and Park waste	7%	15	20%	28%	0	0	3	5	
								Paper/cardboard	37%	122	40%	43%	10	3	69	126	
Industrial	Office	Large Office Buildings	39	1,000 square feet	1,866	lb/ 1,000 square feet	36	Textiles	6%	20	24%	50%	1	0	8	14	24
								Food waste	3%	10	15%	87%	1	0	4	8	
								Wood	9%	29	43%	23%	1	0	10	17	
								Garden and Park waste	4%	13	20%	28%	0	0	2	4	
	General Industrial	Manufacturing - Industrial / Machinery	8	employees	400	lb/ employee	2	Paper/cardboard	50%	18	40%	43%	2	0	10	19	1
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	7	15%	87%	0	0	3	5	
								Wood	4%	2	43%	23%	0	0	1	1	
	Food Processing	Manufacturing - Food / Kindred	467	employees	3,200	lb/ slip	747	Garden and Park waste	1%	0	20%	28%	0	0	0	0	429
								Paper/cardboard	37%	1	40%	43%	0	0	0	1	
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	3%	0	15%	87%	0	0	0	0	
	Lumber Yards	Manufacturing - Lumber & Wood Products	172	employees	6,200	lb/ employee	533	Wood	9%	0	43%	23%	0	0	0	0	261
								Garden and Park waste	4%	0	20%	28%	0	0	0	0	
								Paper/cardboard	36%	271	40%	43%	23	6	153	281	
								Textiles	6%	43	24%	50%	3	1	17	31	
Port	General Port Office	Large Office Buildings	39	1,000 square feet	8,050	lb/ 1,000 square feet	302	Food waste	22%	167	15%	87%	11	3	72	131	200
								Wood	7%	49	43%	23%	2	1	16	29	
								Garden and Park waste	1%	1	20%	28%	0	0	0	0	
								Paper/cardboard	16%	87	40%	43%	7	2	49	80	
	General Port Warehouse	Trucking & Warehousing	1,585	employees	3,800	lb/ employee	3,046	Textiles	21%	109	24%	50%	7	2	43	79	1451
								Food waste	1%	7	15%	87%	0	0	3	5	
								Wood	35%	185	43%	23%	9	2	61	112	
								Garden and Park waste	1%	3	20%	28%	0	0	1	1	
								Paper/cardboard	50%	1,063	40%	43%	91	24	601	1100	
								Textiles	6%	180	24%	50%	3	71	131	131	
								Food waste	4%	122	15%	87%	8	2	52	96	
								Wood	14%	411	43%	23%	21	5	136	249	
								Garden and Park waste	2%	70	20%	28%	2	1	13	24	

Table C-10
2020 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Other Commercial ¹¹	Restaurant	Full-Service Restaurant	40	employees	4,403	lb/employee	88	Paper/cardboard	17%	15	40%	43%	1	0	9	16	56
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	58	15%	87%	4	1	25	46	
								Wood	1%	1	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	73	employees	1,719	lb/employee	63	Paper/cardboard	32%	2	40%	43%	0	0	1	3	30
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	1	
								Wood	13%	1	43%	23%	0	0	0	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Office	Large Office Buildings	-	-	-	-	2,562	Paper/cardboard	50%	2	40%	43%	0	0	1	2	1,702
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	1	15%	87%	0	0	0	1	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Other	Services - Other Misc.	237	spaces	556	lb/ space	66	Paper/cardboard	33%	22	40%	43%	2	0	12	23	34
								Textiles	11%	7	24%	50%	0	0	3	5	
								Food waste	13%	8	15%	87%	1	0	4	7	
								Wood	3%	2	43%	23%	0	0	1	1	
								Garden and Park waste	7%	5	20%	28%	0	0	1	2	
Other Industrial ¹²	-	Manufacturing - Industrial / Machinery	-	-	-	-	444	Paper/cardboard	37%	164	40%	43%	14	4	93	170	207
								Textiles	6%	27	24%	50%	2	0	11	19	
								Food waste	3%	13	15%	87%	1	0	6	10	
								Wood	9%	39	43%	23%	2	1	13	23	
								Garden and Park waste	4%	17	20%	28%	0	0	3	6	
	-	Trucking & Warehousing	10	employees	3800	lb/employee	19	Paper/cardboard	35%	7	40%	43%	1	0	4	7	9
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	4%	1	15%	87%	0	0	0	1	
								Wood	14%	3	43%	23%	0	0	1	2	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
Total																	20,439

Notes:

1. Since waste data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was provided for each building type by the Port of San Diego. See previous tables for the conversion of square footage into number of employees.
2. When not provided by the Port of San Diego or tenants, the Waste Disposal Factor is based on California Integrated Waste Management Board waste disposal data. See previous tables for details.
3. The Percent of Waste Profile for each degradable waste type is the fraction of the total waste disposed. See previous tables for details.
4. The percent Degradable Organic Carbon (DOC) is the fraction of degradable carbon in each degradable waste type. Data for percent DOC is based on IPCC Guidelines. See previous tables for details.
5. The percent Degradable Anaerobic Fraction (DANF) is the fraction of each degradable waste type that is capable of decomposition in anaerobic conditions. Data for percent DANF is based on California Air Resources Board data. See previous tables for details.
6. Represents the total carbon dioxide emissions plus methane emissions converted to carbon dioxide equivalents by a global warming potential factor of 21 based on CCAR 2009. Emission estimates follow CalEEMod guidance and account for an oxidation efficiency of methane of 10%, a destruction efficiency of landfill gas of 98%, and a collection efficiency of landfill gas of 80% per the San Diego County GHG Inventory.
7. Other than the land uses defined in this table, waste from these facilities was assumed to be minimal.
8. Yacht club and marina emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
9. Sport fishing and Commercial Sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
10. Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
11. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative waste data.
12. Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative waste data.

Abbreviations:

CalEEMod - California Emissions Estimator Model
 CARB - California Air Resources Board
 CCAR - California Climate Action Registry
 CIWMB - California Integrated Waste Management Board
 CO₂ - carbon dioxide
 CO₂e - carbon dioxide equivalent
 DANF - Degradable anaerobic fraction
 DOC - Degradable Organic Carbon
 IPCC - Intergovernmental Panel on Climate Change
 lb - pound

Sources:

California Climate Action Registry, 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
 CalEEMod, California Emissions Estimator Model. Available online at: <http://www.caleemod.com/>
 San Diego County Greenhouse Gas Inventory, September 2008. Prepared by the University of San Diego and EPIC. Available online at: <http://www.sandiego.edu/epic/ghginventory/>

Table C-11
2020 Inventory
Emissions from Maritime Activities
San Diego Unified Port District

Sector	2006	2020 Projections	2020 Projections - with Regulations ⁴
	Total Emissions (metric tons CO ₂ e/yr)		
Ocean Going Vessels ¹	55,162	72,786	62,365
Cargo Handling Equipment ²	4,039	6,109	5,639
Commercial Harbor Craft	20,835	22,315	20,083
Locomotive ²	3,085	4,666	4,199
Heavy Duty Vehicles ²	29,343	44,384	37,220
Cruise Terminal Transportation ³	3,830	4,213	3,218
Total	116,294	154,472	132,724

Notes:

1. Per the San Diego Unified Port District Maritime Business Plan, cargo activity was projected to grow an average of 3% annually across all types of cargo, therefore emissions from ocean going vessels, excluding harbor craft, were assumed to grow 3% annually, through 2020. Cruise ship activities were projected to grow 10% from 2006 to 2020.

2. Cargo handling equipment, assist tugs, ocean tugboats, locomotive, and heavy duty vehicle emissions are expected to increase in proportion to the cargo activity, since these are all supporting services.

3. Cruise terminal transportation emissions are expected to increase in proportion to the cruise ship activity, since it is a supporting service.

4. Reductions due to Shorepower and Fuel Switch regulations were applied to applicable Ocean Going Vessels. A 10% reduction due to LCFS was applied to Cargo Handling Equipment, Locomotives, Heavy Duty Vehicles, and Cruise Terminal Transportation. Reductions due to the Heavy Duty (Tractor-Trailer) GHG Regulation were applied to Heavy Duty Vehicles and reductions due to Pavley standards were applied to the applicable portion of the Cruise Terminal Transportation fleet.

Abbreviations:

CARB - California Air Resources Board

CO₂e - carbon dioxide equivalent

GHG - Greenhouse gases

LCFS - Low Carbon Fuel Standard

yr - year

Sources:

California Air Resources Board (CARB). Ocean-going Vessels - Fuel Rule. Available online at:

<http://www.arb.ca.gov/ports/marinevevess/ogv.htm>

California Air Resources Board (CARB). Shore Power for Ocean-going Vessels. Available online at:

<http://www.arb.ca.gov/ports/shorepower/shorepower.htm>

San Diego Unified Port District Maritime Business Plan. December 2008. Figure 4.4-1 Cargo Projections, Current Markets

The Port of San Diego 2006 Emissions Inventory. March 2008. Prepared by Starcrest Consulting Group, LLC. Available online at:

http://sandiegohealth.org/port/2006_emissions_inventory_final.pdf

Table D-1
2035 Inventory
Electricity and Natural Gas Emissions - Land Use Based Metric
San Diego Unified Port District

Tenant Type	Building Type ¹	CEUS Category Mapping	Activity Data ¹ (SF)	Electricity Energy Intensity ² (kWh/SF/yr)	Natural Gas Energy Intensity ² (therm/SF/yr)	Electricity Usage (kWh)	Natural Gas Usage (therm)	Electricity Emission Factor ³ (lb CO ₂ e/MWh)	Natural Gas Emission Factor ³ (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Retail	66,517	15.49	0.024	1,030,350	1,624			269
Retail - 2008 T24	-	Retail	11,701	14.05	0.023	164,392	269			43
Office	-	All Office	37,177	16.40	0.242	609,684	9,002			202
Restaurant	-	Restaurant	224,499	43.73	1.768	9,817,202	396,952			4,589
Restaurant - 2005 T24	-	Restaurant	4,351	42.56	1.767	185,175	7,689			88
Restaurant - 2008 T24	-	Restaurant	37,001	41.37	1.763	1,530,594	65,219			733
Lodging	Rooms	Lodging	5,086,542	16.10	0.617	81,912,785	3,140,894			37,377
	Rooms - 2005 T24	Lodging	1,028,487	15.40	0.616	15,842,665	633,547			7,368
	Rooms - 2008 T24	Lodging	3,267,801	14.61	0.609	47,743,725	1,988,617			22,626
	Restaurant	Restaurant	262,100	43.73	1.768	11,461,457	463,437			5,357
	Restaurant - 2005 T24	Restaurant	33,000	42.56	1.767	1,404,450	58,319			665
	Restaurant - 2008 T24	Restaurant	152,770	41.37	1.763	6,319,510	269,277			3,027
	Meeting Area	All Office	537,900	16.40	0.242	8,821,190	130,250			2,919
	Meeting Area - 2008 T24	All Office	490,667	15.00	0.210	7,360,481	103,265			2,407
	Retail	Retail	13,450	15.49	0.024	208,340	328			54
	Retail - 2008 T24	Retail	265,579	14.05	0.023	3,731,221	6,110			974
	Office	All Office	17,081	16.40	0.242	280,117	4,136			93
	Office	Unrefrigerated Warehouse	115,968	4.54	0.021	526,412	2,416			146
Warehouse/Storage	-	Miscellaneous	1,931	9.72	0.124	18,767	6			240
Museums	Museum	All Office	200	16.40	0.242	3,280	48			1
	Office	Retail	11,200	15.49	0.024	173,488	273			45
	Restaurant	Restaurant	7,000	43.73	1.768	306,105	12,377			143
Classrooms	Classrooms, Offices, Lockers - 2008 T24	Miscellaneous	4,663	9.02	0.118	42,074	550			14
Rental Car	Retail	Retail	52,332	15.49	0.024	810,621	1,278			211
Yacht Clubs	Car Wash	Unrefrigerated Warehouse	6,108	4.54	-	27,726	-			7
	General Building	Miscellaneous	97,934	-	0.124	-	12,150			65
	General Building - 2008 T24 Standards	Miscellaneous	5,000	-	0.118	-	590	556.29	11.73	3
Marinas	Restaurant	Restaurant	5,332	43.73	1.768	233,175	9,428			109
	General Building	Miscellaneous	142,641	-	0.124	-	17,696			94
	General Building - 2005 T24	Miscellaneous	5,468	-	0.123	-	673			4
	General Building - 2008 T24	Miscellaneous	10,000	-	0.118	-	1,180			6
	Office	All Office	32,120	16.40	0.242	526,746	7,778			174
	Retail	Retail	4,163	15.49	0.024	64,485	102			17
	Restaurant	Restaurant	19,679	43.73	1.768	860,549	34,796			402
	General Building	Miscellaneous	6,991	-	0.124	-	867			5
Sport fishing	Restaurant	Restaurant	1,409	43.73	1.768	61,615	2,491			29
Commercial Sport fishing	General Building	Miscellaneous	17,403	-	0.124	-	2,159			11
	Office	All Office	13,152	16.40	0.242	215,680	3,185			71
Excursions	Retail	Retail	4,100	15.49	0.024	63,509	100			17
	Retail	Retail	1,241	15.49	0.024	19,223	30			5
Petroleum	Restaurant	Restaurant	1,600	43.73	1.768	69,967	2,829			33
	Office	All Office	2,055	16.40	0.242	33,701	498			11
Boatyards	Retail	Retail	15,338	15.49	0.024	237,585	374			62
	Office	All Office	16,886	16.40	0.242	276,919	4,089			92
Terminal Tenants	Retail	Retail	1,000	15.49	0.024	15,490	24			4
	Office	All Office	266,100	16.40	0.242	4,363,857	64,435			1,444
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	433,143	4.54	0.021	1,966,160	9,024			544
	Car Wash	Unrefrigerated Warehouse	8,701	4.54	-	39,496	-			10
	Refrigerated Warehouse	Refrigerated Warehouse	288,000	35.31	0.071	10,169,519	20,502			2,675
Industrial	Office	All Office	38,913	16.40	0.242	638,138	9,422			211
	Miscellaneous	Miscellaneous	301,021	9.72	0.124	2,925,538	37,345			937
	Refrigerated Warehouse	Refrigerated Warehouse	60,311	35.31	0.071	2,129,614	4,293			560
Other Commercial ⁴	-	-	-	-	-	1,554,136	30,528			555
Total										97,511

Notes:

- Since CEUS data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego.
- Electricity and natural gas intensities are derived from the 2006 California Commercial End-Use Survey (CEUS), performed by Itron under contract to the California Energy Commission (CEC). Energy usage rates are based on 2002 consumption data, unless they are designated as 2005 T24 or 2008 T24 (under Tenant/Building Type), in which case they are adjusted to reflect the energy intensities equivalent to meeting 2005 and 2008 Title 24 standards, respectively. Adjustments to reflect 2005 and 2008 T24 standards were made per data provided in CEC Impact Analysis reports (CEC 2003, CEC 2007). ENVIRON used data for San Diego Gas & Electric, Zone 13, which is the sector in which the Port of San Diego is located.
- See previous tables for the calculation of the electricity and natural gas emission factors.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative CEUS data.

Abbreviations:

CEC - California Energy Commission
CEUS - California Commercial End-Use Survey
CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MWh - megawatt-hour
SF - square feet
T24 - Title 24
yr - year

Sources:

California Energy Commission. 2006. *California Commercial End-Use Survey*. Prepared by Itron Inc. Available at: <http://www.energy.ca.gov/ceus/>
California Energy Commission. 2003. *Impact Analysis: 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings*. Available at: http://www.energy.ca.gov/title24/2005standards/archive/rulemaking/documents/2003-07-11_400-03-014.PDF
California Energy Commission. 2007. *Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings*. Available at: http://www.energy.ca.gov/title24/2008standards/rulemaking/documents/2007-11-07_IMPACT_ANALYSIS.PDF

Table D-2
2035 Inventory
Electricity and Natural Gas Emissions - Other Metrics
San Diego Unified Port District

Tenant Type	Energy Source	Activity Data ¹ (Unit)	Unit	Energy Intensity	Units	Energy Usage	Units	Electricity Emission Factor ² (lb CO ₂ e/MWh)	Natural Gas Emission Factor ² (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
Port ³	Electricity	-				10,905,642	kWh	556.29	11.73	2,804
	Natural Gas	-				63,119	therm			342
Yacht Clubs ⁴	Electricity	2,337	Slips	3,125	(kWh/unit/yr)	7,303,125	kWh			1,843
Marinas ⁴	Electricity	5,410	Slips			16,906,250				4,266
Sport fishing ⁴	Electricity	75	Slips			234,375				59
Commercial Sport fishing ⁴	Electricity	125	Slips			390,625				99
Boatyards ⁵	Electricity	1,275,429	SF	2.44	(kWh/unit/yr)	3,108,438	kWh			784
	Natural Gas	1,275,429	SF	0.002	(therm/unit/yr)	2,227	therm			12
Shipbuilding ⁶	Electricity	4,639,831	SF	56.76	(kWh/unit/yr)	263,367,151	kWh			66,455
	Natural Gas	4,639,831	SF	0.001	(therm/unit/yr)	5,265	therm			28
Other Commercial ⁷	Electricity	-				29,232,895	kWh			7,376
	Natural Gas	-				318,755	therm			1,696
Other Industrial ⁸	Electricity	-				24,647,874	kWh			6,219
Total										91,983

Notes:

- Activity data was provided by the Port of San Diego.
- See previous tables for the calculation of the electricity and natural gas emission factors.
- Emissions due to Port electricity and natural gas use were derived from data provided by the Port of San Diego.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MWh - megawatt-hour
SF - square feet
yr - year

Table D-3
2035 Inventory
Stationary Combustion (Natural Gas) Emissions
San Diego Unified Port District

Tenant Type	Fuel Use	Usage	Units	Emission Factors ¹ (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
CP Kelco ²	General Stationary Combustion, Cogeneration (Natural Gas)	-			95,833
Other Industrial ³	General Stationary Combustion	2,699,865	therms	11.71	14,340
Total					110,173

Notes:

1. Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
2. Emissions from CP Kelco were reported to CARB in 2008. These emissions are assumed to be representative of year 2020.
3. Other Industrial includes industrial tenants who did not report to CARB. Emissions were calculated based on data provided by the tenants.

Abbreviations

CARB - California Air Resources Board
 CCAR - California Climate Action Registry
 CO₂e - carbon dioxide equivalent
 lb - pound

Sources:

California Air Resources Board. Mandatory Greenhouse Gas Reporting. Available online at: http://arb.ca.gov/cc/reporting/ghg-rep/regulation/2010_regulation.htm

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table D-4
2035 Inventory
Stationary Combustion (Diesel) Emissions
San Diego Unified Port District

Tenant Type	Fuel Use	Usage	Units	Emission Factors ¹ (lb CO ₂ e/unit)	Total Emissions (metric tons CO ₂ e/yr)
Port Events ²	General Stationary Combustion	413	gallons	22.46	4
Other Commercial ³	General Stationary Combustion	249	gallons		3
Other Industrial ⁴	General Stationary Combustion	68,934	gallons		702
Total					709

Notes:

1. Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
2. Diesel stationary combustion from Port events is solely from generators. Data was provided by the Port of San Diego.
3. Other Commercial includes commercial tenants with diesel stationary combustion. Emissions were calculated based on data provided by tenants.
4. Other Industrial includes industrial tenants with diesel stationary combustion. Emissions were calculated based on data provided by tenants.

Abbreviations

CCAR - California Climate Action Registry

CO₂e - carbon dioxide equivalent

lb - pound

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at:
http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table D-5
2035 Inventory
Emissions from Water Use - Land Use Based Metric
San Diego Unified Port District

Tenant Type	Building Type ¹	Land use Mapping	Activity Data ¹ (Unit)	Unit	Indoor Water Usage Factor ² (Gallons/Unit/yr)	Outdoor Water Usage Factor ² (Gallons/Unit/yr)	Indoor Water Usage (MG/yr)	Outdoor Water Usage (MG/yr)	Indoor Water Energy Intensity ³ (kWh/MG)	Outdoor Water Energy Intensity ³ (kWh/MG)	Electricity Usage (kWh)	Electricity Emission Factor ⁴ (lb CO ₂ e/MWh)	Total Emissions metric tons CO ₂ e/yr
Retail	-	Strip Mall	112	employee	21,204	12,996	2.37	1.46			47,098		12
Office	-	General Office Building	150	employee	17,717	10,859	2.66	1.63			52,703		13
Restaurant	-	High turnover (sit down restaurant)	687	employee	56,048	3,578	38.50	2.46			528,715		133
Lodging ⁵	Occupied Rooms	Hotel	8,927	occupied rooms	38,435	4,271	343.11	38.12			4,891,606		1,234
	Restaurant	Quality Restaurant	1,156	employee	56,048	3,578	64.79	4.14			889,658		224
	Meeting Area	General Office Building	4,132	employee	17,717	10,859	73.20	44.87			1,451,791		366
	Retail	Strip Mall	398	employee	21,204	12,996	8.44	5.17			167,366		42
	Office	General Office Building	69	employee	17,717	10,859	1.22	0.75			24,243		6
Warehouse/Storage		Unrefrigerated Warehouse	119	employee	797,340	0	94.88	0.00			1,235,572		312
Museums	Museum	Government Office Building	10	employee	18,972	11,628	0.19	0.12			3,763		1
	Office	General Office Building	1	employee	17,717	10,859	0.02	0.01			351		0
	Retail	Strip Mall	16	employee	21,204	12,996	0.34	0.21			6,728		2
	Restaurant	High turnover (sit down restaurant)	19	employee	56,048	3,578	1.06	0.07			14,622		4
Classrooms	Classrooms, Offices, Lockers	Elementary School	63	student	2,424	6,234	0.15	0.39			6,352		2
Rental Car	Retail	Strip Mall	75	employee	21,204	12,996	1.59	0.97			31,539		8
Yacht Clubs	Restaurant	Quality Restaurant	14	employee	56,048	3,578	0.78	0.05			10,774		3
Marinas	Office	General Office Building	129	employee	17,717	10,859	2.29	1.40			45,325		11
	Retail	Strip Mall	6	employee	21,204	12,996	0.13	0.08			2,523		1
	Restaurant	High turnover (sit down restaurant)	51	employee	56,048	3,578	2.86	0.18			39,250		10
Sport fishing	Restaurant	High turnover (sit down restaurant)	4	employee	56,048	3,578	0.22	0.01			3,078		1
Commercial Sport fishing	Office	General Office Building	53	employee	17,717	10,859	0.94	0.58			18,622		5
	Retail	Strip Mall	6	employee	21,204	12,996	0.13	0.08			2,523		1
Excursions	Retail	Strip Mall	2	employee	21,204	12,996	0.04	0.03			841		0
	Restaurant	High turnover (sit down restaurant)	5	employee	56,048	3,578	0.28	0.02			3,848		1
Petroleum	Gas Station	Gasoline/Service Station	14	employee	21,204	12,996	0.30	0.18			5,887		1
	Office	General Office Building	9	employee	17,717	10,859	0.16	0.10			3,162		1
	Retail	Strip Mall	9	employee	21,204	12,996	0.19	0.12			3,785		1
Boatyards	Office	General Office Building	68	employee	17,717	10,859	1.20	0.74			23,892		6
	Retail	Strip Mall	2	employee	21,204	12,996	0.04	0.03			841		0
Port Buildings	Office	General Office Building	12	employee	17,717	10,859	0.21	0.13			4,216		1
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	37	employee	797,340	0	29.50	0			384,169		97
Terminal Tenants ⁶	Office	General Office Building	97	employee	17,717	10,859	1.72	1.05			34,081		9
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	157	employee	797,340	0	125.18	0			1,630,125		411
Shipbuilding	Heavy Industry	General Heavy Industry	1,649	employee	797,340	0	1,314.81	0			17,121,500		4,320
	Office	General Office Building	157	employee	17,717	10,859	2.78	1.70			55,162		14
Industrial	Light Industry	General Light Industry	500	employee	797,340	0	398.67	0			5,191,480		1,310
	Heavy Industry	General Heavy Industry	115	employee	797,340	0	91.69	0			1,194,040		301
Other Commercial ⁷	-	-	-	-	-	-	12.05	1.27			170,933.0		43
Total													8,908

Notes:

1. Since water usage data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego. See previous tables for the conversion of square footage into number of employees.
2. ENVIRON used data from the Pacific Institute's "Waste Not Want Not" report and US Census Data to estimate the amount of water used at each land use type. See previous tables for details.
3. ENVIRON used energy intensities for indoor and outdoor water use for Southern California from California Energy Commission 2006 Report, *Refining Estimates of Water-Related Energy Use in California*. This includes energy used for water supply and conveyance, treatment, distribution, and wastewater treatment (for indoor water). See previous tables for details.
4. See previous tables for the calculation of the electricity emission factor.
5. The water use rate for lodging is per occupied room, therefore an average occupancy rate for year 2006 (assumed to be the same in future years) in San Diego County was used to estimate the number of *occupied* rooms. The average occupancy rate is from the San Diego Convention & Visitors Bureau.
6. Terminal tenants only include those who are not on the Port water meters. See later tables for the inclusion of Port water use.
7. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative water usage rates.

Abbreviations

CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MG - million gallons of water
MWh - megawatt-hour
yr - year

Sources:

California Energy Commission. 2006. Refining Estimates of Water Related Energy Use in California. CEC-500-2006-118. Available at: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>
Pacific Institute (Gleick, P.H.; Haasz, D.; Henges-Jeck, C.; Srinivasan, V.; Cushing, K.K.; Mann, A.) 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California. Available at: http://www.pacinst.org/reports/urban_usage/
San Diego Convention & Visitors Bureau. San Diego County Visitor Industry Summary for 2006. <http://www.sandiego.org/nav/Visitors>
US Census Bureau. 2000 Census. Table QT-H1: General Housing Characteristics 2000. Available online at: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>

Table D-6
2035 Inventory
Emissions from Water Use - Other Metrics
San Diego Unified Port District

Tenant Type	Activity Data ¹ (Unit)	Unit	Indoor Water Usage Factor (Gallons/Unit/yr)	Outdoor Water Usage Factor (Gallons/Unit/yr)	Indoor Water Usage (MG/yr)	Outdoor Water Usage (MG/yr)	Indoor Water Energy Intensity ² (kWh/MG)	Outdoor Water Energy Intensity ² (kWh/MG)	Electricity Usage (kWh)	Electricity Emission Factor ³ (lb CO2e/MWh)	Total Emissions (metric tons CO2e/yr)
Port ⁴	-				192	-	13,022	11,111	2,505,852	556.29	632
Boatyards ⁵	1,275,429	SF	36	-	45.7	-			595,604		150
Rental Car ⁶	687,150	cars	-	27	-	19			206,143		52
Yacht Clubs ⁷	2,337	Slips	-	969	-	2			25,155		6
Marinas ⁷	5,410	Slips				5			58,232		15
Sport fishing ⁷	75	Slips				0.1			807		0.2
Commercial Sport fishing ⁷	125	Slips				0.1			1,345		0.3
Terminal Tenant Car Wash ⁶	978,863	cars	-	27	-	26			293,656		74
Other Commercial ⁸	-				46	130.4			2,050,509		517
Other Industrial ⁹	-				16	-			202,287		51
Total											1,499

- Notes:**
- Activity data was provided by the Port of San Diego.
 - ENVIRON used energy intensities for indoor and outdoor water use for Southern California from California Energy Commission 2006 Report, *Refining Estimates of Water-Related Energy Use in California*. This includes energy used for water supply and conveyance, treatment, distribution, and wastewater treatment (for indoor water). See previous tables for details.
 - See previous tables for the calculation of the electricity emission factor.
 - Port includes water use from Port owned and operated buildings, National City Marine Terminal (NCMT), Tenth Avenue Marine Terminal (TAMT) (with the exclusion of some tenants who are on their own water meter), and the Cruise Ship Terminal (CST).
 - Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
 - Water use from car washes was calculated based on a metric developed from participating representative tenants to calculate the number of cars washed annually. Average water use per car wash is from the International Car Wash association; the mean value from conveyor car washes was used.
 - Yacht club, marina, sportfishing, and commercial sportfishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
 - Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
 - Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MG - million gallons of water
MWh - megawatt-hour
SF - square feet

Source:
California Energy Commission. 2006. Refining Estimates of Water Related Energy Use in California. CEC-500-2006-118. Available at: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>
International Car Wash Association. *Water Use in the Professional Car Wash Industry*. 2002. Available online at: <http://www.carwash.org/operatorinformation/research/Pages/EnvironmentalReports.aspx>

Table D-7
2035 Inventory
On-Road Transportation - VMT/Trip Based Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Trip Generation Mapping	Trip Length Mapping	Activity Data ¹	units	Trip Generation Rate ²	units/day	Vehicle Trips per yr ³	Trip Length (miles) ⁴	Yearly VMT	Fleet wide Running Emission Factor ⁵ (g/VMT)	Fleet wide Starting/Idling Emission Factor ⁶ (g/rip)	Total Emissions ⁴ (metric tons CO ₂ e/yr)
Retail	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	78	1,000 sq ft	40	trips/1,000 sq ft	1,141,987	4.3	4,910,545			1,807
Office	Office	Standard Commercial Office	Office	37	1,000 sq ft	20	trips/1,000 sq ft	271,395	8.8	2,388,276			862
Restaurant	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	266	1,000 sq ft	130	trips/1,000 sq ft	12,614,642	4.7	59,288,818			21,749
Lodging ⁷	Lodging	Hotel (w/convention facilities/restaurant)	Lodging	8,927	occupied rooms	10	trips/occupied room	32,584,306	7.6	247,640,722			89,667
Warehouse/Storage	Warehouse	Warehousing	Industrial Plant	116	1,000 sq ft	5	trips/1,000 sq ft	211,642	11.7	2,476,207			890
Museum	Museum	Government Office (Civic Center)	Government Office	2	1,000 sq ft	30	trips/1,000 sq ft	21,144	6	126,867			46
Museums	Office	Standard Commercial Office	Office	0.2	1,000 sq ft	20	trips/1,000 sq ft	1,460	8.8	12,848			5
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	11	1,000 sq ft	40	trips/1,000 sq ft	163,520	4.3	703,136			259
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	7	1,000 sq ft	130	trips/1,000 sq ft	332,150	4.7	1,561,105			573
Classrooms	Elementary School	Elementary School	Elementary School	5	1,000 sq ft	39	trips/1,000 sq ft	66,378	3.4	225,685			84
Yacht Club	Restaurant	Restaurant: Quality	Restaurant	5	1,000 sq ft	100	trips/1,000 sq ft	194,627	4.7	914,746			336
	Slips	Marinas	Marinas	2,337	slips	4	trips/berth	3,412,020	6.3	21,495,726			7,817
	Office	Standard Commercial Office	Office	32	1,000 sq ft	20	trips/1,000 sq ft	234,476	8.8	2,063,389			745
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	4	1,000 sq ft	40	trips/1,000 sq ft	60,780	4.3	261,353			96
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	20	1,000 sq ft	130	trips/1,000 sq ft	933,769	4.7	4,388,712			1,610
	Slips	Marinas	Marinas	5,410	slips	4	trips/berth	7,898,600	6.3	49,761,180			18,097
Sport fishing	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	1	1,000 sq ft	130	trips/1,000 sq ft	66,857	4.7	314,228	337	55	115
	Slips	Marinas	Marinas	75	slips	4	trips/berth	109,500	6.3	689,850			251
Commercial Sport fishing	Office	Standard Commercial Office	Office	13	1,000 sq ft	20	trips/1,000 sq ft	96,008	8.8	844,872			305
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	4	1,000 sq ft	40	trips/1,000 sq ft	59,860	4.3	257,398			95
	Slips	Marinas	Marinas	247	slips	4	trips/berth	360,620	6.3	2,271,906			826
Excursions	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	1	1,000 sq ft	40	trips/1,000 sq ft	18,119	4.3	77,910			29
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	2	1,000 sq ft	130	trips/1,000 sq ft	75,920	4.7	356,824			131
	Office	Standard Commercial Office	Office	2	1,000 sq ft	20	trips/1,000 sq ft	15,002	8.8	132,013			48
Petroleum	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	6	1,000 sq ft	40	trips/1,000 sq ft	88,432	4.3	380,258			140
	Fueling Stations	Gasoline Station with food mart	Gasoline with Food Mart	2	stations	865	trips/station	631,731	2.8	1,768,846			664
Open Space		Park: Developed	Parks	187	acres	50	trips/acre	3,413,978	5.4	18,435,483			6,733
	Boatyard	Manufacturing/Assembly	Industrial Plant	29	acres	50	trips/acre	534,357	11.7	6,251,973			2,247
Boatyards	Office	Standard Commercial Office	Office	17	1,000 sq ft	20	trips/1,000 sq ft	123,268	8.8	1,084,757			392
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	1	1,000 sq ft	40	trips/1,000 sq ft	14,600	4.3	62,780			23
	Office	Standard Commercial Office	Office	273	1,000 sq ft	20	trips/1,000 sq ft	1,990,615	8.8	17,517,413			6,324
Terminal Tenants	Unrefrigerated Warehouse	Warehousing	Industrial Plant	544	1,000 sq ft	5	trips/1,000 sq ft	993,587	11.7	11,624,963			4,178
	Refrigerated Warehouse	Warehousing	Industrial Plant	288	1,000 sq ft	5	trips/1,000 sq ft	525,600	11.7	6,149,520			2,210
Port Offices		Standard Commercial Office	Office	260	1,000 sq ft	20	trips/1,000 sq ft	1,895,014	8.8	16,676,124			6,021
Port Warehouses		Warehousing	Industrial Plant	946	1,000 sq ft	5	trips/1,000 sq ft	1,726,635	11.7	20,201,632			7,260
Shipbuilding		Manufacturing/Assembly	Industrial Plant	107	acres	50	trips/acre	1,943,915	11.7	22,743,800			8,174
	Office	Standard Commercial Office	Office	39	1,000 sq ft	20	trips/1,000 sq ft	284,061	8.8	2,499,739			903
Industrial Tenants	Refrigerated Warehouse	Warehousing	Industrial Plant	39	1,000 sq ft	5	trips/1,000 sq ft	71,015	11.7	830,879			299
Other Tenants	Manufacturing/Assembly	Industrial Plant	Industrial Plant	64	acres	50	trips/acre	1,165,577	11.7	13,637,253			4,901
Rental Car ⁸								280,320	15.2	4,259,637	1,219	22	5,471
Events ⁹	-	-	Parks	-		-		342,150	5.4	1,847,610			675
Other Commercial ¹⁰								8,519,279	8.3	70,943,867	337	55	25,640
												Total	228,696

Notes:

1. Since trip data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was provided for each building type by the Port of San Diego.
2. The Trip Generation Rate represents the total number of trips (one-way trips) that are generated by a site with the given land use. Trip generation rates are from the San Diego Municipal Code, Land Development Code, Trip Generation Manual (May 2003) and the SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002). See previous tables for details.
3. Annual vehicle trips are calculated assuming the weekday trip rate applies during the weekend (assuming 365 days per year of weekday travel rates).
4. Trip lengths are from SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002) and represent average weighted trip lengths for all trips to and from the general land use site. See previous tables for details.
5. The fleet wide running and starting emission factors are calculated from EMFAC2007 for San Diego County for year 2035 and include reductions due to Pavley and LCFS standards. See previous tables for calculation details.
6. CO₂e/CO₂0.95: The United States Environmental Protection Agency (USEPA) recommends assuming that CH₄, N₂O, and HFCs are 5% of emissions on a CO₂e basis.
7. The trip rate for lodging is per occupied room, therefore an average occupancy rate for year 2006 (assumed to be the same in future years) in San Diego County was used to estimate the number of occupied rooms. The average occupancy rate is from the San Diego Convention & Visitors Bureau.
8. Rental car bus trips were calculated based on a metric developed from participating representative tenants. Emissions factors are for the EMFAC vehicle class 'Other Bus'.
9. Event data, including attendees, was provided by the Port of San Diego. Each attendee was conservatively assumed to drive their own car to and from the event. Trip length data was assumed to be equal to that of parks, as all events are held in the parks.
10. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative trip data.

Abbreviations:

CH₄ - methane
CO₂ - carbon dioxide
CO₂e - carbon dioxide equivalent
g - gram
HFC - hydrofluorocarbons
N₂O - nitrous oxide
SANDAG - San Diego Association of Governments
sq ft - square feet
USEPA - United States Environmental Protection Agency
VMT - vehicle miles traveled
yr - year

Sources:

San Diego Convention & Visitors Bureau. San Diego County Visitor Industry Summary for 2006. <http://www.sandiego.org/nav/Visitors>
San Diego Municipal Code, Land Development Code, Trip Generation Manual. May 2003. Available online at: <http://www.sandiego.gov/planning/pdf/tripmanual.pdf>
SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region. April 2002. Available online at: http://www.sandag.org/uploads/publicationid/publicationid_1140_5044.pdf

**Table D-8
2035 Inventory
On-Road Transportation - Fuel Based Emissions
San Diego Unified Port District**

Tenant Type	Fuel	Activity Data ¹ (Unit)	Unit	Fuel Intensity (gal/unit/yr)	Fuel Usage (gallons)	Emission Factors ² (lb CO ₂ e/gallon)	Total Emissions (metric tons CO ₂ e/yr)
Port On-Road ³				-			658
Rental Car ⁴	Gasoline		-		1,558,314	13.03	9,209
Boatyards ⁵	Gasoline	1,275,429	SF	0.03	40,633	13.76	254
Shipbuilding ⁶	Gasoline	align="right">4,639,831	align="center">SF	0.060	279,603	13.76	1,745
	Diesel			0.047	216,209	15.85	1,555
	LPG			0.029	133,665	13.87	841
Other Commercial ⁷	Gasoline			-			17
	Propane			-			120
Other Industrial ⁸	Diesel			-			5,019
Total							19,417

Notes:

1. Activity data was provided by the Port of San Diego.
2. Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
3. Emissions due to Port on-road transportation were derived from data provided by the Port of San Diego.
4. Emissions from rental cars are scaled from the San Francisco Airport Climate Action Plan, based on passenger count statistics for year 2006 (assumed to be representative for future years) for San Diego Airport and San Francisco International Airport. There are a total of 16 rental car agencies at the San Diego Airport, 4 of which are within the Port's jurisdiction, therefore the total rental car emissions are scaled by (4/16).
5. Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards. This was assumed to be separate from commute/customer/vendor trips, which are quantified under the VMT based on-road emissions.
6. Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage. This was assumed to be separate from commute/customer/vendor trips, which are quantified under the VMT based on-road emissions.
7. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
8. Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CCAR - California Climate Action Registry
CO₂e - carbon dioxide equivalent
gal - gallon
lb - pound
LPG - liquefied petroleum gas
SF - square feet
VMT - vehicle miles traveled
yr - year

Sources:

Bureau of Transportation Statistics. T-100 Segment data for Airport Flight Data. http://www.transtats.bts.gov/Data_Elements.aspx?Data=2. Accessed January, 2011.
California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
San Francisco International Airport. 2010. SFO Climate Action Plan. Available online at: <http://www.flysfo.com/web/page/about/green/index.html>. Accessed February, 2011.
San Diego International Airport Rental Car Agencies. http://www.san.org/sdia/transportation/car_rental.aspx. Accessed August, 2011.

Table D-9
2035 Inventory
Emissions from Off-road Equipment Use
San Diego Unified Port District

Tenant Type	Fuel	Activity Data ¹ (Unit)	Unit	Fuel Intensity (gal/unit/yr)	Fuel Usage (gallons)	Emission Factors ² (lb CO ₂ e/gallon)	Total Emissions (metric tons CO ₂ e/yr)
Port Off-road ³				-			532
Yacht Clubs ⁴	Gasoline	2,337	Slips	14	32,322	17.66	259
Marinas ⁴	Gasoline	5,410	Slips		74,823	17.66	599
Sportfishing ⁴	Gasoline	75	Slips		1,037	17.66	8
Commercial Sportfishing ⁴	Gasoline	247	Slips		3,416	17.66	27
Recreational Boating ⁵				-			120,040
Boatyards ⁶	Diesel	1,275,429	SF	0.041	52,823	20.34	487
	Propane			0.012	15,396	12.94	90
Shipbuilding ⁷	Diesel	4,639,831	SF	0.129	596,477	20.34	5,504
	Diesel			-	39,966	20.34	369
Lumber Yards ⁸	LPG	954,603	-	0.013	12,174	13.05	72
	LPG			-	12,174	13.05	72
Other Commercial ⁹	Gasoline		-		12,592	18	101
Other Industrial ¹⁰	Diesel			-			57
Total							128,147

Notes:

- Activity data was provided by the Port of San Diego.
- Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
- Emissions due to Port off-road transportation were derived from data provided by the Port of San Diego.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- OFFROAD2007 was run for San Diego County for year 2035 and then adjusted to scale according to the projected population growth from 2020 to 2035 in the San Diego Region (SANDAG 2011). The total emissions were scaled by the % of boating days spent on the Ocean versus the Delta, SF Bay, and Inland Lakes for residents within the South Coast over years 2007-2008 (California Boater Survey, July 2011). This assumption, in effect, adjusts the San Diego County boat population and activity to reflect only those boats which are active off of the coastline of San Diego County. The fleet mix and boating habits within San Diego County are assumed to be similar to that surveyed in the South Coast. Total emissions from boating activity in the ocean (off the San Diego County coastline) were then adjusted by the portion of slip area present within the Port of San Diego versus the slip area present within the San Diego County coastline. Emissions were adjusted to account for the Low Carbon Fuel Standard (LCFS), which is anticipated to decrease emissions by 10% by year 2020. LCFS is included in this analysis, recognizing that it is currently being challenged.
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Lumber yard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CARB - California Air Resources Board
 CCAR - California Climate Change Registry
 CO₂e - carbon dioxide equivalent
 gal - gallon
 lb - pound
 LCFS - Low Carbon Fuel Standard
 LPG - liquefied petroleum gas
 SANDAG - San Diego Association of Governments
 SF - square feet
 yr - year

Sources:

2007-2009 California Boater Survey. July 2011. Available online at: <http://www.coastal.ca.gov/ccbn/materialsforeducators.html>
 California Air Resources Board (CARB). 2006. Off-Road Emissions Inventory Program (OFFROAD2007). Available Online: <http://www.arb.ca.gov/msei/offroad/offroad.htm>
 California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
 San Diego Association of Governments (SANDAG). 2011. 2050 Regional Transportation Plan. Technical Appendix 2. Available online at: <http://www.sandag.org/uploads/2050RTP/F2050RTP2A2.pdf>

Table D-10
2035 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Retail, Other Stores	112	employees	1,719	lb/employee	96	Paper/cardboard	32%	31	40%	43%	3	1	17	32	46
								Textiles	4%	4	24%	50%	0	0	2	3	
								Food waste	11%	11	15%	87%	1	0	5	8	
								Wood	13%	12	43%	23%	1	0	4	7	
								Garden and Park waste	2%	2	20%	28%	0	0	0	1	
Office	-	Large Office Buildings	37	1,000 square feet	1,866	lb/1,000 square feet	35	Paper/cardboard	50%	17	40%	43%	1	0	10	18	23
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	6	15%	87%	0	0	3	5	
								Wood	4%	1	43%	23%	0	0	0	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Restaurant	-	Full-Service Restaurant	687	employees	4,403	lb/employee	1,512	Paper/cardboard	17%	262	40%	43%	22	6	148	271	967
								Textiles	0%	6	24%	50%	0	0	2	4	
								Food waste	66%	1,000	15%	87%	65	17	429	785	
								Wood	1%	9	43%	23%	0	0	3	6	
								Garden and Park waste	0%	2	20%	28%	0	0	0	1	
Hotel/Lodging	Hotel - Rooms	Large Hotels	8,146	employees	3,903	lb/employee	15,897	Paper/cardboard	32%	5,135	40%	43%	439	115	2904	5313	9836
								Textiles	4%	556	24%	50%	33	9	221	404	
								Food waste	36%	5,786	15%	87%	375	98	2483	4543	
								Wood	4%	588	43%	23%	29	8	195	357	
								Garden and Park waste	4%	668	20%	28%	19	5	123	225	
	Restaurant	Full-Service Restaurant	1,156	employees	4,403	lb/employee	2,545	Paper/cardboard	17%	440	40%	43%	38	10	249	456	1627
								Textiles	0%	10	24%	50%	1	0	4	7	
								Food waste	66%	1,682	15%	87%	109	29	722	1321	
								Wood	1%	15	43%	23%	1	0	5	9	
								Garden and Park waste	0%	3	20%	28%	0	0	0	1	
	Meeting Area	Large Office Buildings	1,029	1,000 square feet	1,866	lb/1,000 square feet	960	Paper/cardboard	50%	483	40%	43%	41	11	273	499	638
								Textiles	6%	54	24%	50%	3	1	21	39	
								Food waste	18%	176	15%	87%	11	3	75	138	
								Wood	4%	40	43%	23%	2	1	13	24	
								Garden and Park waste	1%	6	20%	28%	0	0	1	2	
	Retail	Retail, Other Stores	398	employees	1,719	lb/employee	342	Paper/cardboard	32%	109	40%	43%	9	2	62	113	165
								Textiles	4%	15	24%	50%	1	0	6	11	
								Food waste	11%	38	15%	87%	2	1	16	30	
								Wood	13%	44	43%	23%	2	1	15	27	
								Garden and Park waste	2%	7	20%	28%	0	0	1	2	
	Office	Large Office Buildings	17	1,000 square feet	1,866	lb/1,000 square feet	16	Paper/cardboard	50%	8	40%	43%	1	0	5	8	11
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	18%	3	15%	87%	0	0	1	2	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Warehouse/Storage	-	Trucking & Warehousing	119	employees	3,800	lb/employee	226	Paper/cardboard	35%	79	40%	43%	7	2	45	82	108
								Textiles	6%	13	24%	50%	1	0	5	10	
								Food waste	4%	9	15%	87%	1	0	4	7	
								Wood	14%	31	43%	23%	2	0	10	19	
								Garden and Park waste	2%	5	20%	28%	0	0	1	2	
Museums	Museum	Services - Other Misc.	10	employees	1,800	lb/employee	9	Paper/cardboard	33%	3	40%	43%	0	0	2	3	5
								Textiles	11%	1	24%	50%	0	0	0	1	
								Food waste	13%	1	15%	87%	0	0	0	1	
								Wood	3%	0	43%	23%	0	0	0	0	
								Garden and Park waste	7%	1	20%	28%	0	0	0	0	
	Office	Large Office Buildings	0.20	1,000 square feet	1,866	lb/1,000 square feet	0	Paper/cardboard	50%	0	40%	43%	0	0	0	0	0.1
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	0	15%	87%	0	0	0	0	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	16	employees	1,719	lb/employee	14	Paper/cardboard	32%	4	40%	43%	0	0	2	5	7
								Textiles	4%	1	24%	50%	0	0	0	0	
								Food waste	11%	2	15%	87%	0	0	1	1	
								Wood	13%	2	43%	23%	0	0	1	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	19	employees	4,403	lb/employee	42	Paper/cardboard	17%	7	40%	43%	1	0	4	7	27
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	28	15%	87%	2	0	12	22	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
Classrooms	Elementary School	Services - Other Misc.	15	employees	1,800	lb/employee	14	Paper/cardboard	33%	4	40%	43%	0	0	3	5	7
								Textiles	11%	1	24%	50%	0	0	1	1	
								Food waste	13%	2	15%	87%	0	0	1	1	
								Wood	3%	0	43%	23%	0	0	0	0	
								Garden and Park waste	7%	1	20%	28%	0	0	0	0	
Rental Car ⁷	Retail	Retail, Other Stores	75	employees	1,719	lb/employee	64	Paper/cardboard	32%	20	40%	43%	2	0	12	21	31
								Textiles	4%	3	24%	50%	0	0	1	2	
								Food waste	11%	7	15%	87%	0	0	3	6	
								Wood	13%	8	43%	23%	0	0	3	5	
								Garden and Park waste	2%	1	20%	28%	0	0	0	0	

Table D-10
2025 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Yacht Clubs ⁴	Restaurant	Full-Service Restaurant	14	employees	4,403	lb/ employee	31	Paper/cardboard	17%	5	40%	43%	0	0	3	6	20
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	20	15%	87%	1	0	9	16	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Services - Other Misc.	2,337	slips	556	lb/ slip	649	Paper/cardboard	33%	216	40%	43%	18	5	122	223	331
								Textiles	11%	69	24%	50%	4	1	27	50	
								Food waste	13%	82	15%	87%	5	1	35	64	
								Wood	3%	21	43%	23%	1	0	7	13	
								Garden and Park waste	7%	46	20%	28%	1	0	8	16	
Marinas ⁴	Office	Large Office Buildings	32	1,000 square feet	1,866	lb/ 1,000 square feet	30	Paper/cardboard	50%	15	40%	43%	1	0	9	16	20
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	5	15%	87%	0	0	2	4	
								Wood	4%	1	43%	23%	0	0	0	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	6	employees	1,719	lb/ employee	5	Paper/cardboard	32%	2	40%	43%	0	0	1	2	2
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	0	
								Wood	13%	1	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	51	employees	4,403	lb/ employee	112	Paper/cardboard	17%	19	40%	43%	2	0	11	20	72
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	74	15%	87%	5	1	32	58	
								Wood	1%	1	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Services - Other Misc.	5,410	slips	556	lb/ slip	1,503	Paper/cardboard	33%	499	40%	43%	43	11	282	516	767
								Textiles	11%	159	24%	50%	10	2	63	116	
								Food waste	13%	189	15%	87%	12	3	81	149	
								Wood	3%	48	43%	23%	2	1	16	29	
								Garden and Park waste	7%	107	20%	28%	3	1	20	36	
Sport fishing ⁹	Restaurant	Full-Service Restaurant	4	employees	4,403	lb/ employee	9	Paper/cardboard	17%	2	40%	43%	0	0	1	2	6
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	6	15%	87%	0	0	2	5	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Manufacturing - Food / Kindred	75	slips	1,692	lb/ slip	63	Paper/cardboard	36%	23	40%	43%	2	1	13	24	36
								Textiles	6%	4	24%	50%	0	0	1	3	
								Food waste	22%	14	15%	87%	1	0	6	11	
								Wood	7%	4	43%	23%	0	0	1	3	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Commercial Sport fishing ⁹	Office	Large Office Buildings	13	1,000 square feet	1,866	lb/ 1,000 square feet	12	Paper/cardboard	50%	6	40%	43%	1	0	3	6	8
								Textiles	6%	1	24%	50%	0	0	0	0	
								Food waste	18%	2	15%	87%	0	0	1	2	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	6	employees	1,719	lb/ employee	5	Paper/cardboard	32%	2	40%	43%	0	0	1	2	2
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	0	
								Wood	13%	1	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Slips	Manufacturing - Food / Kindred	247	slips	1,692	lb/ slip	209	Paper/cardboard	36%	76	40%	43%	6	2	43	78	120
								Textiles	6%	12	24%	50%	1	0	5	9	
								Food waste	22%	47	15%	87%	3	1	20	37	
								Wood	7%	14	43%	23%	1	0	4	8	
								Garden and Park waste	1%	1	20%	28%	0	0	0	0	
Excursions ⁷	Retail	Retail, Other Stores	2	employees	1,719	lb/ employee	2	Paper/cardboard	32%	1	40%	43%	0	0	0	1	1
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	0	15%	87%	0	0	0	0	
								Wood	13%	0	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	5	employees	4,403	lb/ employee	11	Paper/cardboard	17%	2	40%	43%	0	0	1	2	7
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	7	15%	87%	0	0	3	6	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
Petroleum ⁷	Office	Large Office Buildings	2	1,000 square feet	1,866	lb/ 1,000 square feet	2	Paper/cardboard	50%	1	40%	43%	0	0	1	2	1
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	0	15%	87%	0	0	0	0	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	22	employees	1,719	lb/ employee	19	Paper/cardboard	32%	6	40%	43%	1	0	3	6	9
								Textiles	4%	1	24%	50%	0	0	0	1	
								Food waste	11%	2	15%	87%	0	0	1	2	
								Wood	13%	2	43%	23%	0	1	1	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	

Table D-10
2035 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Boatyards ¹⁰	Boatyards	Manufacturing - Industrial / Machinery	264	employees	400	lb/ employee	53	Paper/cardboard	37%	19	40%	43%	2	0	11	20	25
								Textiles	6%	3	24%	50%	0	0	1	2	
								Food waste	3%	2	15%	87%	0	0	1	1	
								Wood	9%	5	43%	23%	0	0	2	3	
								Garden and Park waste	4%	2	20%	28%	0	0	0	1	
	Office	Large Office Buildings	17	1,000 square feet	1,866	lb/ 1,000 square feet	16	Paper/cardboard	50%	8	40%	43%	1	0	4	8	10
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	18%	3	15%	87%	0	0	1	2	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	2	employees	1,719	lb/ employee	2	Paper/cardboard	32%	1	40%	43%	0	0	0	1	1
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	0	15%	87%	0	0	0	0	
								Wood	13%	0	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
Terminals	Office	Large Office Buildings	266	1,000 square feet	1,866	lb/ 1,000 square feet	248	Paper/cardboard	50%	125	40%	43%	11	3	71	129	165
								Textiles	6%	14	24%	50%	1	0	6	10	
								Food waste	18%	45	15%	87%	3	1	20	36	
								Wood	4%	10	43%	23%	1	0	3	6	
								Garden and Park waste	1%	1	20%	28%	0	0	0	1	
	Unrefrigerated Warehouse	Trucking & Warehousing	444	employees	3,800	lb/ employee	843	Paper/cardboard	35%	294	40%	43%	25	7	166	305	402
								Textiles	6%	50	24%	50%	3	1	20	36	
								Food waste	4%	34	15%	87%	2	1	14	26	
								Wood	14%	114	43%	23%	6	1	38	69	
								Garden and Park waste	2%	19	20%	28%	1	0	4	7	
	Refrigerated Warehouse	Trucking & Warehousing	295	employees	3,800	lb/ employee	561	Paper/cardboard	35%	196	40%	43%	17	4	111	202	267
								Textiles	6%	33	24%	50%	2	1	13	24	
								Food waste	4%	22	15%	87%	1	0	10	18	
								Wood	14%	76	43%	23%	4	1	25	46	
								Garden and Park waste	2%	13	20%	28%	0	0	2	4	
	Office/Unrefrigerated Warehouse/Cruise Ships	Services - Other Misc.	-	-	-	-	215	Paper/cardboard	33%	71	40%	43%	6	2	40	74	110
								Textiles	11%	23	24%	50%	1	0	9	17	
								Food waste	13%	27	15%	87%	2	0	12	21	
								Wood	3%	7	43%	23%	0	0	2	4	
								Garden and Park waste	7%	15	20%	28%	0	0	3	5	
Shipbuilding	-	Manufacturing - Industrial / Machinery	1,649	employees	400	lb/ employee	330	Paper/cardboard	37%	122	40%	43%	10	3	69	126	154
								Textiles	6%	20	24%	50%	1	0	8	14	
								Food waste	3%	10	15%	87%	1	0	4	8	
								Wood	9%	29	43%	23%	1	0	10	17	
								Garden and Park waste	4%	13	20%	28%	0	0	2	4	
	Office	Large Office Buildings	39	1,000 square feet	1,866	lb/ 1,000 square feet	36	Paper/cardboard	50%	18	40%	43%	2	0	10	19	24
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	7	15%	87%	0	0	3	5	
								Wood	4%	2	43%	23%	0	0	1	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	General Industrial	Manufacturing - Industrial / Machinery	8	employees	400	lb/ employee	2	Paper/cardboard	37%	1	40%	43%	0	0	0	1	1
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	3%	0	15%	87%	0	0	0	0	
								Wood	9%	0	43%	23%	0	0	0	0	
								Garden and Park waste	4%	0	20%	28%	0	0	0	0	
	Food Processing	Manufacturing - Food / Kindred	467	employees	3,200	lb/ slip	747	Paper/cardboard	36%	271	40%	43%	23	6	153	281	429
								Textiles	6%	43	24%	50%	3	1	17	31	
								Food waste	22%	167	15%	87%	11	3	72	131	
								Wood	7%	49	43%	23%	2	1	16	29	
								Garden and Park waste	1%	1	20%	28%	0	0	0	0	
	Lumber Yards	Manufacturing - Lumber & Wood Products	172	employees	6,200	lb/ employee	533	Paper/cardboard	16%	87	40%	43%	7	2	49	90	261
								Textiles	21%	109	24%	50%	7	2	43	79	
								Food waste	1%	7	15%	87%	0	0	3	5	
								Wood	35%	185	43%	23%	9	2	61	112	
								Garden and Park waste	1%	3	20%	28%	0	0	1	1	
Port	General Port Office	Large Office Buildings	39	1,000 square feet	8,050	lb/ 1,000 square feet	302	Paper/cardboard	50%	152	40%	43%	13	3	86	157	200
								Textiles	6%	17	24%	50%	1	0	7	12	
								Food waste	18%	55	15%	87%	4	1	24	43	
								Wood	4%	13	43%	23%	1	0	4	8	
								Garden and Park waste	1%	2	20%	28%	0	0	0	1	
	General Port Warehouse	Trucking & Warehousing	1,585	employees	3,800	lb/ employee	3,046	Paper/cardboard	35%	1,063	40%	43%	91	24	601	1100	1451
								Textiles	6%	180	24%	50%	11	3	71	131	
								Food waste	4%	122	15%	87%	8	2	52	96	
								Wood	14%	411	43%	23%	21	5	136	249	
								Garden and Park waste	2%	70	20%	28%	2	1	13	24	

Table D-10
2035 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric ton CO ₂ e/yr)
Other Commercial ¹¹	Restaurant	Full-Service Restaurant	40	employees	4,403	lb/employee	88	Paper/cardboard	17%	15	40%	43%	1	0	9	16	56
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	58	15%	87%	4	1	25	46	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	73	employees	1,719	lb/employee	63	Paper/cardboard	32%	2	40%	43%	0	0	1	3	30
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	1	
								Wood	13%	1	43%	23%	0	0	0	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Office	Large Office Buildings	-	-	-	-	2,562	Paper/cardboard	50%	2	40%	43%	0	0	1	2	1,702
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	1	15%	87%	0	0	0	1	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Other	Services - Other Misc.	237	spaces	556	lb/ space	66	Paper/cardboard	33%	22	40%	43%	2	0	12	23	34	
							Textiles	11%	7	24%	50%	0	0	3	5		
							Food waste	13%	8	15%	87%	1	0	4	7		
							Wood	3%	2	43%	23%	0	0	1	1		
							Garden and Park waste	7%	5	20%	28%	0	0	1	2		
Other Industrial ¹²	-	Manufacturing - Industrial /Machinery	-	-	-	-	444	Paper/cardboard	37%	164	40%	43%	14	4	93	170	207
								Textiles	6%	27	24%	50%	2	0	11	19	
								Food waste	3%	13	15%	87%	1	0	6	10	
								Wood	9%	39	43%	23%	2	1	13	23	
								Garden and Park waste	4%	17	20%	28%	0	0	3	6	
	-	Trucking & Warehousing	10	employees	3800	lb/employee	19	Paper/cardboard	35%	7	40%	43%	1	0	4	7	9
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	4%	1	15%	87%	0	0	0	1	
								Wood	14%	3	43%	23%	0	0	1	2	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
Total																	20,439

Notes:

1. Since waste data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego. See previous tables for the conversion of square footage into number of employees.
2. When not provided by the Port of San Diego or tenants, the Waste Disposal Factor is based on California Integrated Waste Management Board waste disposal data. See previous tables for details.
3. The Percent of Waste Profile for each degradable waste type is the fraction of the total waste disposed. See previous tables for details.
4. The Percent Degradable Organic Carbon (DOC) is the fraction of degradable carbon in each degradable waste type. Data for percent DOC is based on IPCC Guidelines. See previous tables for details.
5. The Percent Degradable Anaerobic Fraction (DANF) is the fraction of each degradable waste type that is capable of decomposition in anaerobic conditions. Data for percent DANF is based on California Air Resources Board data. See previous tables for details.
6. Represents the total carbon dioxide emissions plus methane emissions converted to carbon dioxide equivalents by a global warming potential factor of 21 based on CCAR 2009. Emission estimates follow CalEEMod guidance and account for an oxidation efficiency of methane of 10%, a destruction efficiency of landfill gas of 98%, and a collection efficiency of landfill gas of 80% per the San Diego County GHG Inventory.
7. Other than the land uses defined in this table, waste from these facilities was assumed to be minimal.
8. Yacht club and marina emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
9. Sport fishing and Commercial Sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
10. Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
11. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative waste data.
12. Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative waste data.

Abbreviations:

CalEEMod - California Emissions Estimator Model
 CARB - California Air Resources Board
 CCAR - California Climate Action Registry
 CIWMB - California Integrated Waste Management Board
 CO₂ - carbon dioxide
 CO₂e - carbon dioxide equivalent
 DANF - Degradable anaerobic fraction
 DOC - Degradable Organic Carbon
 IPCC - Intergovernmental Panel on Climate Change
 lb - pound

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
 CalEEMod. California Emissions Estimator Model. Available online at: <http://www.caleemod.com/>
 San Diego County Greenhouse Gas Inventory. September 2008. Prepared by the University of San Diego and EPIC. Available online at: <http://www.sandiego.edu/epic/ghginventory/>

Table D-11
2035 Inventory
Emissions from Maritime Activities
San Diego Unified Port District

Sector	2006	2035 Projections	2035 Projections - with Regulations ⁴
	Total Emissions (metric tons CO ₂ e/yr)		
Ocean Going Vessels ¹	55,162	119,424	100,018
Cargo Handling Equipment ²	4,039	9,376	8,654
Commercial Harbor Craft	20,835	24,649	22,184
Locomotive ²	3,085	7,161	6,445
Heavy Duty Vehicles ²	29,343	68,118	57,124
Cruise Terminal Transportation ³	3,830	7,610	5,269
Total	116,294	236,339	199,695

Notes:

1. Cargo growth through 2035 was projected based on data provided by the San Diego Unified Port District Maritime Business Plan (32% from 2020 to 2030, 3% annually from 2030 to 2035). Cruise growth from 2020 to 2035 was estimated based on the San Diego Unified Port District Cruise Market Update (81% from 2020 to 2035).
2. Cargo handling equipment, assist tugs, ocean tugboats, locomotive, and heavy duty vehicle emissions are expected to increase in proportion to the cargo activity, since these are all supporting services.
3. Cruise terminal transportation emissions are expected to increase in proportion to the cruise ship activity, since it is a supporting service.
4. Reductions due to Shorepower and Fuel Switch regulations were applied to applicable Ocean Going Vessels. A 10% reduction due to LCFS was applied to Cargo Handling Equipment, Locomotives, Heavy Duty Vehicles, and Cruise Terminal Transportation. Reductions due to the Heavy Duty (Tractor-Trailer) GHG Regulation were applied to Heavy Duty Vehicles and reductions due to Pavley standards were applied to the applicable portion of the Cruise Terminal Transportation fleet.

Abbreviations:

CARB - California Air Resources Board

CO₂e - carbon dioxide equivalent

yr - year

Sources:

California Air Resources Board (CARB). Ocean-going Vessels - Fuel Rule. Available online at: <http://www.arb.ca.gov/ports/marinevess/ogv.htm>

California Air Resources Board (CARB). Shore Power for Ocean-going Vessels. Available online at: <http://www.arb.ca.gov/ports/shorepower/shorepower.htm>

San Diego Unified Port District Maritime Business Plan. December 2008. Figure 4.4-1 Cargo Projections, Current Markets

San Diego Unified Port District, Cruise Market Update. June 2011. Figure 23 - Port of San Diego Passenger Growth Composite, 2000-2040

The Port of San Diego 2006 Emissions Inventory. March 2008. Prepared by Starcrest Consulting Group, LLC. Available online at: http://sandiegohealth.org/port/2006_emissions_inventory_final.pdf

Table E-1
2050 Inventory
Electricity and Natural Gas Emissions - Land Use Based Metric
San Diego Unified Port District

Tenant Type	Building Type ¹	CEUS Category Mapping	Activity Data ¹ (SF)	Electricity Energy Intensity ² (kWh/SF/yr)	Natural Gas Energy Intensity ² (therm/SF/yr)	Electricity Usage (kWh)	Natural Gas Usage (therm)	Electricity Emission Factor ³ (lb CO ₂ e/MWh)	Natural Gas Emission Factor ³ (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Retail	66,517	15.49	0.024	1,030,350	1,624			269
Retail - 2008 T24	-	Retail	11,701	14.05	0.023	164,392	269			43
Office	-	All Office	37,177	16.40	0.242	609,684	9,002			202
Restaurant	-	Restaurant	224,499	43.73	1.768	9,817,202	396,952			4,589
Restaurant - 2005 T24	-	Restaurant	4,351	42.56	1.767	185,175	7,689			88
Restaurant - 2008 T24	-	Restaurant	37,001	41.37	1.763	1,530,594	65,219			733
Lodging	Rooms	Lodging	5,086,542	16.10	0.617	81,912,785	3,140,894			37,377
	Rooms - 2005 T24	Lodging	1,028,487	15.40	0.616	15,842,665	633,547			7,368
	Rooms - 2008 T24	Lodging	3,267,801	14.61	0.609	47,743,725	1,988,617			22,626
	Restaurant	Restaurant	262,100	43.73	1.768	11,461,457	463,437			5,357
	Restaurant - 2005 T24	Restaurant	33,000	42.56	1.767	1,404,450	58,319			665
	Restaurant - 2008 T24	Restaurant	152,770	41.37	1.763	6,319,510	269,277			3,027
	Meeting Area	All Office	537,900	16.40	0.242	8,821,190	130,250			2,919
	Meeting Area - 2008 T24	All Office	490,667	15.00	0.210	7,360,481	103,265			2,407
	Retail	Retail	13,450	15.49	0.024	208,340	328			54
	Retail - 2008 T24	Retail	265,579	14.05	0.023	3,731,221	6,110			974
	Office	All Office	17,081	16.40	0.242	280,117	4,136			93
	Office	Unrefrigerated Warehouse	115,968	4.54	0.021	526,412	2,416			146
Warehouse/Storage	-	Unrefrigerated Warehouse	1,931	9.72	0.124	18,767	6			240
Museums	Museum	Miscellaneous	1,931	9.72	0.124	18,767	6			240
	Office	All Office	200	16.40	0.242	3,280	48			1
	Retail	Retail	11,200	15.49	0.024	173,488	273			45
	Restaurant	Restaurant	7,000	43.73	1.768	306,105	12,377			143
Classrooms	Classrooms, Offices, Lockers - 2008 T24	Miscellaneous	4,663	9.02	0.118	42,074	550			14
Rental Car	Retail	Retail	52,332	15.49	0.024	810,621	1,278			211
Yacht Clubs	Car Wash	Unrefrigerated Warehouse	6,108	4.54	-	27,726	-			7
	General Building	Miscellaneous	97,934	-	0.124	-	12,150			65
	General Building - 2008 T24 Standards	Miscellaneous	5,000	-	0.118	-	590			3
	Restaurant	Restaurant	5,332	43.73	1.768	233,175	9,428			109
Marinas	General Building	Miscellaneous	142,641	-	0.124	-	17,696			94
	General Building - 2005 T24	Miscellaneous	5,468	-	0.123	-	673			4
	General Building - 2008 T24	Miscellaneous	10,000	-	0.118	-	1,180			6
	Office	All Office	32,120	16.40	0.242	526,746	7,778			174
	Retail	Retail	4,163	15.49	0.024	64,485	102			17
	Restaurant	Restaurant	19,679	43.73	1.768	860,549	34,796			402
	General Building	Miscellaneous	6,991	-	0.124	-	867			5
	Restaurant	Restaurant	1,409	43.73	1.768	61,615	2,491			29
Sport fishing	General Building	Miscellaneous	17,403	-	0.124	-	2,159			11
Commercial Sport fishing	Office	All Office	13,152	16.40	0.242	215,680	3,185			71
Excursions	Retail	Retail	4,100	15.49	0.024	63,509	100			17
	Retail	Retail	1,241	15.49	0.024	19,223	30			5
	Restaurant	Restaurant	1,600	43.73	1.768	69,967	2,829			33
Petroleum	Office	All Office	2,055	16.40	0.242	33,701	498			11
	Retail	Retail	15,338	15.49	0.024	237,585	374			62
Boatyards	Office	All Office	16,886	16.40	0.242	276,919	4,089			92
	Retail	Retail	1,000	15.49	0.024	15,490	24			4
Terminal Tenants	Office	All Office	266,100	16.40	0.242	4,363,857	64,435			1,444
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	433,143	4.54	0.021	1,966,160	9,024			544
	Car Wash	Unrefrigerated Warehouse	8,701	4.54	-	39,496	-			10
	Refrigerated Warehouse	Refrigerated Warehouse	288,000	35.31	0.071	10,169,519	20,502			2,675
	Office	All Office	38,913	16.40	0.242	638,138	9,422			211
Industrial	Miscellaneous	Miscellaneous	301,021	9.72	0.124	2,925,538	37,345			937
	Refrigerated Warehouse	Refrigerated Warehouse	60,311	35.31	0.071	2,129,614	4,293			560
Other Commercial ⁴	-	-	-	-	-	1,554,136	30,528			555
Total										97,511

Notes:

1. Since CEUS data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego.

2. Electricity and natural gas intensities are derived from the 2006 California Commercial End-Use Survey (CEUS), performed by Itron under contract to the California Energy Commission (CEC). Energy usage rates are based on 2002 consumption data, unless they are designated as 2005 T24 or 2008 T24 (under Tenant/Building Type), in which case they are adjusted to reflect the energy intensities equivalent to meeting 2005 and 2008 Title 24 standards, respectively. Adjustments to reflect 2005 and 2008 T24 standards were made per data provided in CEC Impact Analysis reports (CEC 2003, CEC 2007). ENVIRON used data for San Diego Gas & Electric, Zone 13, which is the sector in which the Port of San Diego is located.

3. See previous tables for the calculation of the electricity and natural gas emission factors.

4. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative CEUS data.

Abbreviations:

CEC - California Energy Commission

CEUS - California Commercial End-Use Survey

CO₂e - carbon dioxide equivalent

kWh - kilowatt-hour

lb - pound

MWh - megawatt-hour

SF - square feet

T24 - Title 24

yr - year

Sources:

California Energy Commission. 2006. California Commercial End-Use Survey. Prepared by Itron Inc. Available at: <http://www.energy.ca.gov/ceus/>

California Energy Commission. 2003. Impact Analysis: 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Available at: http://www.energy.ca.gov/title24/2005standards/archive/rulemaking/documents/2003-07-11_400-03-014.PDF

California Energy Commission. 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Available at: http://www.energy.ca.gov/title24/2008standards/rulemaking/documents/2007-11-07_IMPACT_ANALYSIS.PDF

Table E-2
2050 Inventory
Electricity and Natural Gas Emissions - Other Metrics
San Diego Unified Port District

Tenant Type	Energy Source	Activity Data ¹ (Unit)	Unit	Energy Intensity	Units	Energy Usage	Units	Electricity Emission Factor ² (lb CO ₂ e/MWh)	Natural Gas Emission Factor ² (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
Port ³	Electricity	-				10,905,642	kWh	556.29	11.73	2,804
	Natural Gas	-				63,119	therm			342
Yacht Clubs ⁴	Electricity	2,337	Slips	3,125	(kWh/unit/yr)	7,303,125	kWh			1,843
Marinas ⁴	Electricity	5,410	Slips			16,906,250				4,266
Sport fishing ⁴	Electricity	75	Slips			234,375				59
Commercial Sport fishing ⁴	Electricity	125	Slips			390,625				99
Boatyards ⁵	Electricity	1,275,429	SF	2.44	(kWh/unit/yr)	3,108,438	kWh			784
	Natural Gas	1,275,429	SF	0.002	(therm/unit/yr)	2,227	therm			12
Shipbuilding ⁶	Electricity	4,639,831	SF	56.76	(kWh/unit/yr)	263,367,151	kWh			66,455
	Natural Gas	4,639,831	SF	0.001	(therm/unit/yr)	5,265	therm			28
Other Commercial ⁷	Electricity	-				29,232,895	kWh			7,376
	Natural Gas	-				318,755	therm			1,696
Other Industrial ⁸	Electricity	-				24,647,874	kWh			6,219
Total										91,983

Notes:

- Activity data was provided by the Port of San Diego.
- See previous tables for the calculation of the electricity and natural gas emission factors.
- Emissions due to Port electricity and natural gas use were derived from data provided by the Port of San Diego.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CO₂e - carbon dioxide equivalent
kWh - kilowatt-hour
lb - pound
MWh - megawatt-hour
SF - square feet
yr - year

Table E-3
2050 Inventory
Stationary Combustion (Natural Gas) Emissions
San Diego Unified Port District

Tenant Type	Fuel Use	Usage	Units	Emission Factors ¹ (lb CO ₂ e/therm)	Total Emissions (metric tons CO ₂ e/yr)
CP Kelco ²	General Stationary Combustion, Cogeneration (Natural Gas)	-			95,833
Other Industrial ³	General Stationary Combustion	2,699,865	therms	11.71	14,340
Total					110,173

Notes:

1. Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
2. Emissions from CP Kelco were reported to CARB in 2008. These emissions are assumed to be representative of year 2020.
3. Other Industrial includes industrial tenants who did not report to CARB. Emissions were calculated based on data provided by the tenants.

Abbreviations

CARB - California Air Resources Board
 CCAR - California Climate Action Registry
 CO₂e - carbon dioxide equivalent
 lb - pound

Sources:

California Air Resources Board. Mandatory Greenhouse Gas Reporting. Available online at: http://arb.ca.gov/cc/reporting/ghg-rep/regulation/2010_regulation.htm
 California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table E-4
2050 Inventory
Stationary Combustion (Diesel) Emissions
San Diego Unified Port District

Tenant Type	Fuel Use	Usage	Units	Emission Factors ¹ (lb CO ₂ e/unit)	Total Emissions (metric tons CO ₂ e/yr)
Port Events ²	Diesel	413	gallons	22.46	4
Other Commercial ³	General Stationary Combustion	249	gallons		3
Other Industrial ⁴	General Stationary Combustion	68,934	gallons		702
Total					709

Notes:

1. Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
2. Diesel stationary combustion from Port events is solely from generators. Data was provided by the Port of San Diego.
3. Other Commercial includes commercial tenants with diesel stationary combustion. Emissions were calculated based on data provided by tenants.
4. Other Industrial includes industrial tenants with diesel stationary combustion. Emissions were calculated based on data provided by tenants.

Abbreviations

CCAR - California Climate Action Registry

CO₂e - carbon dioxide equivalent

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at:
http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Table E-5
2050 Inventory
Emissions from Water Use - Land Use Based Metric
San Diego Unified Port District

Tenant Type	Building Type ¹	Land use Mapping	Activity Data ¹ (Unit)	Unit	Indoor Water Usage Factor ² (Gallons/Unit/yr)	Outdoor Water Usage Factor ² (Gallons/Unit/yr)	Indoor Water Usage (MG/yr)	Outdoor Water Usage (MG/yr)	Indoor Water Energy Intensity ³ (kWh/MG)	Outdoor Water Energy Intensity ³ (kWh/MG)	Electricity Usage (kWh)	Electricity Emission Factor ⁴ (lb CO ₂ e/MWh)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Strip Mall	112	employee	21,204	12,996	2.37	1.46			47,098		12
Office	-	General Office Building	150	employee	17,717	10,859	2.66	1.63			52,703		13
Restaurant	-	High turnover (sit down restaurant)	687	employee	56,048	3,578	38.50	2.46			528,715		133
Lodging ⁵	Occupied Rooms	Hotel	8,927	occupied rooms	38,435	4,271	343.11	38.12			4,891,606		1,234
	Restaurant	Quality Restaurant	1,156	employee	56,048	3,578	64.79	4.14			889,658		224
	Meeting Area	General Office Building	4,132	employee	17,717	10,859	73.20	44.87			1,451,791		366
	Retail	Strip Mall	398	employee	21,204	12,996	8.44	5.17			167,366		42
	Office	General Office Building	69	employee	17,717	10,859	1.22	0.75			24,243		6
Warehouse/Storage		Unrefrigerated Warehouse	119	employee	797,340	0	94.88	0.00			1,235,572		312
Museums	Museum	Government Office Building	10	employee	18,972	11,628	0.19	0.12			3,763		1
	Office	General Office Building	1	employee	17,717	10,859	0.02	0.01			351		0
	Retail	Strip Mall	16	employee	21,204	12,996	0.34	0.21			6,728		2
	Restaurant	High turnover (sit down restaurant)	19	employee	56,048	3,578	1.06	0.07			14,622		4
Classrooms	Classrooms, Offices, Lockers	Elementary School	63	student	2,424	6,234	0.15	0.39			6,352		2
Rental Car	Retail	Strip Mall	75	employee	21,204	12,996	1.59	0.97			31,539		8
Yacht Clubs	Restaurant	Quality Restaurant	14	employee	56,048	3,578	0.78	0.05			10,774		3
Marinas	Office	General Office Building	129	employee	17,717	10,859	2.29	1.40			45,325		11
	Retail	Strip Mall	6	employee	21,204	12,996	0.13	0.08			2,523		1
	Restaurant	High turnover (sit down restaurant)	51	employee	56,048	3,578	2.86	0.18			39,250		10
Sport fishing	Restaurant	High turnover (sit down restaurant)	4	employee	56,048	3,578	0.22	0.01			3,078		1
Commercial Sport fishing	Office	General Office Building	53	employee	17,717	10,859	0.94	0.58			18,622		5
	Retail	Strip Mall	6	employee	21,204	12,996	0.13	0.08			2,523		1
Excursions	Retail	Strip Mall	2	employee	21,204	12,996	0.04	0.03			841		0
	Restaurant	High turnover (sit down restaurant)	5	employee	56,048	3,578	0.28	0.02			3,848		1
Petroleum	Gas Station	Gasoline/Service Station	14	employee	21,204	12,996	0.30	0.18			5,887		1
	Office	General Office Building	9	employee	17,717	10,859	0.16	0.10			3,162		1
	Retail	Strip Mall	9	employee	21,204	12,996	0.19	0.12			3,785		1
Boatyards	Office	General Office Building	68	employee	17,717	10,859	1.20	0.74			23,892		6
	Retail	Strip Mall	2	employee	21,204	12,996	0.04	0.03			841		0
Port Buildings	Office	General Office Building	12	employee	17,717	10,859	0.21	0.13			4,216		1
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	37	employee	797,340	0	29.50	0			384,169		97
Terminal Tenants ⁶	Office	General Office Building	97	employee	17,717	10,859	1.72	1.05			34,081		9
	Unrefrigerated Warehouse	Unrefrigerated Warehouse	157	employee	797,340	0	125.18	0			1,630,125		411
Shipbuilding	Heavy Industry	General Heavy Industry	1,649	employee	797,340	0	1,314.81	0			17,121,500		4,320
	Office	General Office Building	157	employee	17,717	10,859	2.78	1.70			55,162		14
Industrial	Light Industry	General Light Industry	500	employee	797,340	0	398.67	0			5,191,480		1,310
	Heavy Industry	General Heavy Industry	115	employee	797,340	0	91.69	0			1,194,040		301
Other Commercial ⁷	-	-	-	-	-	-	12.05	1.27			170,933.0		43
Total													8,908

Notes:

1. Since water usage data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego. See previous tables for the conversion of square footage into number of employees.
2. ENVIRON used data from the Pacific Institute's "Waste Not Want Not" report and US Census Data to estimate the amount of water used at each land use type. See previous tables for details.
3. ENVIRON used energy intensities for indoor and outdoor water use for Southern California from California Energy Commission 2006 Report, *Refining Estimates of Water-Related Energy Use in California*. This includes energy used for water supply and conveyance, treatment, distribution, and wastewater treatment (for indoor water). See previous tables for details.
4. See previous tables for the calculation of the electricity emission factor.
5. The water use rate for lodging is per occupied room, therefore an average occupancy rate for year 2006 (assumed to be the same in future years) in San Diego County was used to estimate the number of *occupied* rooms. The average occupancy rate is from the San Diego Convention & Visitors Bureau.
6. Terminal tenants only include those who are not on the Port water meters. See later tables for the inclusion of Port water use.
7. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative water usage rates.

Abbreviations

CO₂e - carbon dioxide equivalent
 kWh - kilowatt-hour
 lb - pound
 MG - million gallons of water
 MWh - megawatt-hour
 yr - year

Sources:

California Energy Commission. 2006. Refining Estimates of Water Related Energy Use in California. CEC-500-2006-118. Available at: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>
 Pacific Institute (Gleick, P.H.; Haasz, D.; Henges-Jeck, C.; Srinivasan, V.; Cushing, K.K.; Mann, A.) 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California. Available at: http://www.pacinst.org/reports/urban_usage/
 San Diego Convention & Visitors Bureau. San Diego County Visitor Industry Summary for 2006. <http://www.sandiego.org/nav/Visitors>
 US Census Bureau. 2000 Census. Table QT-H1: General Housing Characteristics 2000. Available online at: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>

Table E-6
2050 Inventory
Emissions from Water Use - Other Metrics
San Diego Unified Port District

Tenant Type	Activity Data ¹ (Unit)	Unit	Indoor Water Usage Factor (Gallons/Unit/yr)	Outdoor Water Usage Factor (Gallons/Unit/yr)	Indoor Water Usage (MG/yr)	Outdoor Water Usage (MG/yr)	Indoor Water Energy Intensity ² (kWh/MG)	Outdoor Water Energy Intensity ² (kWh/MG)	Electricity Usage (kWh)	Electricity Emission Factor ³ (lb CO ₂ e/MWh)	Total Emissions (metric tons CO ₂ e/yr)
Port ⁴	-				192	-	13,022	11,111	2,505,852	556.29	632
Boatyards ⁵	1,275,429	SF	36	-	45.7	-			595,604		150
Rental Car ⁶	687,150	cars	-	27	-	19			206,143		52
Yacht Clubs ⁷	2,337	Slips	-	969	-	2			25,155		6
Marinas ⁷	5,410	Slips				5			58,232		15
Sport fishing ⁷	75	Slips				0.1			807		0.2
Commercial Sport fishing ⁷	125	Slips				0.1			1,345		0.3
Terminal Tenant Car Wash ⁶	978,863	cars	-	27	-	26			293,656		74
Other Commercial ⁸	-				46	130.4			2,050,509		517
Other Industrial ⁹	-				16	-			202,287		51
Total											1,499

Notes:

- Activity data was provided by the Port of San Diego.
- ENVIRON used energy intensities for indoor and outdoor water use for Southern California from California Energy Commission 2006 Report, Refining Estimates of Water-Related Energy Use in California. This includes energy used for water supply and conveyance, treatment, distribution, and wastewater treatment (for indoor water). See previous tables for details.
- See previous tables for the calculation of the electricity emission factor.
- Port data includes water use from Port owned and operated buildings, National City Marine Terminal (NCMT), Tenth Avenue Marine Terminal (TAMT) (with the exclusion of some tenants who are on their own water meter), and the Cruise Ship Terminal (CST).
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Water use from car washes was calculated based on a metric developed from participating representative tenants to calculate the number of cars washed annually. Average water use per car wash is from the International Car Wash association; the mean value from conveyor car washes was used.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CEC - California Energy Commission
CO₂e - carbon dioxide equivalent
CST - Cruise Ship Terminal
kWh - kilowatt-hour
lb - pound
MG - million gallons of water
MWh - megawatt-hour
NCMT - National City Marine Terminal
SF - square feet
TAMT - Tenth Avenue Marine Terminal
yr - year

Source:

California Energy Commission. 2006. Refining Estimates of Water Related Energy Use in California. CEC-500-2006-118. Available at: <http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>
International Car Wash Association. *Water Use in the Professional Car Wash Industry*. 2002. Available online at: <http://www.carwash.org/operatorinformation/research/Pages/EnvironmentalReports.aspx>

Table E-7
2050 Inventory
On-Road Transportation - VMT/Trip Based Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Trip Generation Mapping	Trip Length Mapping	Activity Data ²	units	Trip Generation Rate ²	units/day	Vehicle Trips per yr ³	Trip Length (miles) ⁴	Yearly VMT	Fleet wide Running Emission Factor ⁵ (g/VMT)	Fleet wide Starting/Idling Emission Factor ⁶ (g/trip)	Annual Emissions ⁷ (metric tons CO ₂ e/yr)
Retail	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	78	1,000 sq ft	40	trips/1,000 SF	1,141,987	4.3	4,910,545			1,780
Office	Office	Standard Commercial Office	Office	37	1,000 sq ft	20	trips/1,000 SF	271,395	8.8	2,388,276			850
Restaurant	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	266	1,000 sq ft	130	trips/1,000 SF	12,614,642	4.7	59,288,818			21,427
Lodging ⁸	Lodging	Hotel (w/convention facilities/restaurant)	Lodging	8,927	occupied rooms	10	trips/occupied room	32,584,306	7.6	247,640,722			88,348
Warehouse/Storage	Warehouse	Warehousing	Industrial Plant	116	1,000 sq ft	5	trips/1,000 SF	211,642	11.7	2,476,207			877
Museum	Museum	Government Office (Civic Center)	Government Office	2	1,000 sq ft	30	trips/1,000 SF	21,144	6	126,867			46
Museums	Office	Standard Commercial Office	Office	0.2	1,000 sq ft	20	trips/1,000 SF	1,460	8.8	12,848			5
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	11	1,000 sq ft	40	trips/1,000 SF	163,520	4.3	703,136			255
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	7	1,000 sq ft	130	trips/1,000 SF	332,150	4.7	1,561,105			564
Classrooms	Elementary School	Elementary School	Elementary School	5	1,000 sq ft	39	trips/1,000 SF	66,378	3.4	225,685			83
Yacht Club	Restaurant	Restaurant: Quality	Restaurant	5	1,000 sq ft	100	trips/1,000 SF	194,627	4.7	914,746			331
	Slips	Marinas	Marinas	2,337	slips	4	trips/berth	3,412,020	6.3	21,495,726			7,702
	Office	Standard Commercial Office	Office	32	1,000 sq ft	20	trips/1,000 SF	234,076	8.8	2,063,389			734
Marinas	Retail	Specialty Retail Center/Strip	Commercial Shops	4	1,000 sq ft	40	trips/1,000 SF	60,780	4.3	261,353			95
	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	20	1,000 sq ft	130	trips/1,000 SF	933,769	4.7	4,388,712			1,586
	Slips	Marinas	Marinas	5,410	slips	4	trips/berth	7,898,600	6.3	49,761,180			17,830
Sport fishing	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	1	1,000 sq ft	130	trips/1,000 SF	66,857	4.7	314,228	332	54	114
	Slips	Marinas	Marinas	75	slips	4	trips/berth	109,500	6.3	689,850			247
	Office	Standard Commercial Office	Office	13	1,000 sq ft	20	trips/1,000 SF	96,008	8.8	844,872			301
Commercial Sport fishing	Retail	Specialty Retail Center/Strip	Commercial Shops	4	1,000 sq ft	40	trips/1,000 SF	59,860	4.3	257,398			93
	Slips	Marinas	Marinas	247	slips	4	trips/berth	360,620	6.3	2,271,906			814
	Retail	Specialty Retail Center/Strip	Commercial Shops	1	1,000 sq ft	40	trips/1,000 SF	18,119	4.3	77,910			28
Excursions	Restaurant	Restaurant: High Turnover (sit-down)	Restaurant	2	1,000 sq ft	130	trips/1,000 SF	75,920	4.7	356,824			129
	Office	Standard Commercial Office	Office	2	1,000 sq ft	20	trips/1,000 SF	15,002	8.8	132,013			47
Petroleum	Retail	Specialty Retail Center/Strip	Commercial Shops	6	1,000 sq ft	40	trips/1,000 SF	88,432	4.3	380,258			138
	Fueling Stations	Gasoline Station with food mart	Gasoline with Food Mart	2	stations	865	trips/station	631,731	2.8	1,768,846			654
Open Space	Park: Developed	Parks	Parks	187	acres	50	trips/acre	3,413,978	5.4	18,435,483			6,634
	Boatyard	Manufacturing/Assembly	Industrial Plant	29	acres	50	trips/acre	534,357	11.7	6,251,973			2,214
Boatyards	Office	Standard Commercial Office	Office	17	1,000 sq ft	20	trips/1,000 SF	123,268	8.8	1,084,757			386
	Retail	Specialty Retail Center/Strip Commercial	Commercial Shops	1	1,000 sq ft	40	trips/1,000 SF	14,600	4.3	62,780			23
	Office	Standard Commercial Office	Office	273	1,000 sq ft	20	trips/1,000 SF	1,990,619	8.8	17,517,413			6,232
Terminal Tenants	Unrefrigerated Warehouse	Warehousing	Industrial Plant	544	1,000 sq ft	5	trips/1,000 SF	993,587	11.7	11,624,963			4,117
	Refrigerated Warehouse	Warehousing	Industrial Plant	288	1,000 sq ft	5	trips/1,000 SF	525,600	11.7	6,149,520			2,178
Port Offices		Standard Commercial Office	Office	260	1,000 sq ft	20	trips/1,000 SF	1,895,014	8.8	16,676,124			5,932
Port Warehouses		Warehousing	Industrial Plant	946	1,000 sq ft	5	trips/1,000 SF	1,726,635	11.7	20,201,632			7,154
Shipbuilding		Manufacturing/Assembly	Industrial Plant	107	acres	50	trips/acre	1,943,915	11.7	22,743,800			8,054
	Office	Standard Commercial Office	Office	39	1,000 sq ft	20	trips/1,000 SF	284,061	8.8	2,499,739			889
Industrial Tenants	Refrigerated Warehouse	Warehousing	Industrial Plant	39	1,000 sq ft	5	trips/1,000 SF	71,015	11.7	830,879			294
	Other Tenants	Manufacturing/Assembly	Industrial Plant	64	acres	50	trips/acre	1,165,577	11.7	13,637,253			4,829
Rental Car ⁹				-				280,320	15.2	4,259,637	1,221	22	5,480
Events ⁹			Parks	-		-		342,150	5.4	1,847,610			665
Other Commercial ¹⁰				-		-		8,519,279	8.3	70,943,867	332	54	25,263
Total													225,419

Notes:

- Since trip data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was provided for each building type by the Port of San Diego.
- The Trip Generation Rate represents the total number of trips (one-way trips) that are generated by a site with the given land use. Trip generation rates are from the San Diego Municipal Code, Land Development Code, Trip Generation Manual (May 2003) and the SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002). See previous tables for details.
- Annual vehicle trips are calculated assuming the weekday trip rate applies during the weekend (assuming 365 days per year of weekday travel rates).
- Trip lengths are from SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002) and represent average weighted trip lengths for all trips to and from the general land use site. See previous tables for details.
- The fleet wide running and starting emission factors are calculated from EMFAC2007 for San Diego County for year 2040 and include reductions due to Pavley and LCFS standards. See previous tables for calculation details. 2040 is the latest year available in EMFAC. This was assumed to be representative of 2050.
- CO₂e=CO₂/0.95: The United States Environmental Protection Agency (USEPA) recommends assuming that CH₄, N₂O, and HFCs are 5% of emissions on a CO₂e basis.
- The trip rate for lodging is per occupied room, therefore an average occupancy rate for year 2006 (assumed to be the same in future years) in San Diego County was used to estimate the number of *occupied* rooms. The average occupancy rate is from the San Diego Convention & Visitors Bureau.
- Rental car bus trips were calculated based on a metric developed from participating representative tenants. Emissions factors are for the EMFAC vehicle class "Other Bus".
- Event data, including attendees, was provided by the Port of San Diego. Each attendee was conservatively assumed to drive their own car to and from the event. Trip length data was assumed to be equal to that of parks, as all events are held in the parks.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative trip data.

Abbreviations:

CH₄ - methane
CO₂ - carbon dioxide
CO₂e - carbon dioxide equivalent
g - gram
HFC - hydrofluorocarbons
N₂O - nitrous oxide
SANDAG - San Diego Association of Governments
sq ft - square feet
USEPA - United States Environmental Protection Agency
VMT - vehicle miles traveled
yr - year

Sources:

San Diego Convention & Visitors Bureau, San Diego County Visitor Industry Summary for 2006. <http://www.sandiego.org/nav/Visitors>
San Diego Municipal Code, Land Development Manual, May 2003. Available online at: <http://www.sandiego.gov/planning/pdf/tripmanual.pdf>
SANDAG (Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002. Available online at: http://www.sandag.org/uploads/publicationid/publicationid_1140_5044.pdf

Table E-8
2050 Inventory
On-Road Transportation - Fuel Based Emissions
San Diego Unified Port District

Tenant Type	Fuel	Activity Data ¹ (Unit)	Unit	Fuel Intensity (gal/unit/yr)	Fuel Usage (gallons)	Emission Factors ² (lb CO ₂ e/gallon)	Total Emissions (metric tons CO ₂ e/yr)
Port On-Road ³				-			649
Rental Car ⁴	Gasoline		-		1,558,314	12.85	9,082
Boatyards ⁵	Gasoline	1,275,429	SF	0.03	40,633	13.56	250
Shipbuilding ⁶	Gasoline	align="right">4,639,831	align="center">SF	0.060	279,603	13.56	1,719
	Diesel			0.047	216,209	15.62	1,532
	LPG			0.029	133,665	13.87	841
Other Commercial ⁷	Gasoline			-			17
	Propane			-			120
Other Industrial ⁸	Diesel			-			5,017
Total							19,227

Notes:

1. Activity data was provided by the Port of San Diego.
2. Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
3. Emissions due to Port on-road transportation were derived from data provided by the Port of San Diego.
4. Emissions from rental cars are scaled from the San Francisco Airport Climate Action Plan, based on passenger count statistics for year 2006 (assumed to be representative for future years) for San Diego Airport and San Francisco International Airport. There are a total of 16 rental car agencies at the San Diego Airport, 4 of which are within the Port's jurisdiction, therefore the total rental car emissions are scaled by (4/16).
5. Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards. This was assumed to be separate from commute/customer/vendor trips, which are quantified under the VMT based on-road emissions.
6. Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage. This was assumed to be separate from commute/customer/vendor trips, which are quantified under the VMT based on-road emissions.
7. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
8. Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CCAR - California Climate Action Registry
CO₂e - carbon dioxide equivalent
gal - gallon
lb - pound
LPG - liquefied petroleum gas
SF - square feet
VMT - vehicle miles traveled
yr - year

Sources:

Bureau of Transportation Statistics. T-100 Segment data for Airport Flight Data. http://www.transtats.bts.gov/Data_Elements.aspx?Data=2. Accessed January, 2011.

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

San Francisco International Airport. 2010. SFO Climate Action Plan. Available online at: <http://www.flysfo.com/web/page/about/green/index.html>. Accessed February, 2011.

San Diego International Airport Rental Car Agencies. http://www.san.org/sdia/transportation/car_rental.aspx. Accessed August, 2011.

Table E-9
2050 Inventory
Emissions from Off-road Equipment Use
San Diego Unified Port District

Tenant Type	Fuel	Activity Data ¹ (Unit)	Unit	Fuel Intensity (gal/unit/yr)	Fuel Usage (gallons)	Emission Factors ² (lb CO ₂ e/gallon)	Total Emissions (metric tons CO ₂ e/yr)
Port Off-road ³				-			532
Yacht Clubs ⁴	Gasoline	2,337	Slips	14	32,322	17.66	259
Marinas ⁴	Gasoline	5,410	Slips		74,823	17.66	599
Sport fishing ⁴	Gasoline	75	Slips		1,037	17.66	8
Commercial Sport fishing ⁴	Gasoline	247	Slips		3,416	17.66	27
Recreational Boating ⁵				-			132,048
Boatyards ⁶	Diesel	1,275,429	SF	0.041	52,823	20.34	487
	Propane			0.012	15,396	12.94	90
Shipbuilding ⁷	Diesel	4,639,831	SF	0.129	596,477	20.34	5,504
Lumber Yards ⁸	Diesel	954,603	-	0.042	39,966	20.34	369
	LPG		-	0.013	12,174	13.05	72
Other Commercial ⁹	Gasoline		-		12,592	18	101
Other Industrial ¹⁰	Diesel		-				57
Total							140,154

Notes:

- Activity data was provided by the Port of San Diego.
- Emission factors are from the California Climate Action Registry (CCAR) Reporting Protocol v 3.1; see previous tables for details.
- Emissions due to Port off-road transportation were derived from data provided by the Port of San Diego for year 2006.
- Yacht club, marina, sport fishing, and commercial sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
- OFFROAD2007 was run for San Diego County for year 2040 and then adjusted to scale according to the projected population growth from 2020 to 2050 in the San Diego Region (SANDAG 2011). 2040 is the latest year available in OFFROAD2007; this was assumed to be representative of 2050. The total emissions were scaled by the % of boating days spent on the Ocean versus the Delta, SF Bay, and Inland Lakes for residents within the South Coast over years 2007-2008 (California Boater Survey, July 2011). This assumption, in effect, adjusts the San Diego County boat population and activity to reflect only those boats which are active off of the coastline of San Diego County. The fleet mix and boating habits within San Diego County are assumed to be similar to that surveyed in the South Coast. Total emissions from boating activity in the ocean (off the San Diego County coastline) were then adjusted by the portion of slip area present within the Port of San Diego versus the slip area present within the San Diego County coastline. Emissions were adjusted to account for the Low Carbon Fuel Standard (LCFS), which is anticipated to decrease emissions by 10% by year 2020. LCFS is included in this analysis, recognizing that it is currently being challenged.
- Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
- Shipbuilding emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Lumber yard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel square footage.
- Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.
- Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were calculated based on data provided by participating tenants.

Abbreviations

CARB - California Air Resources Board
 CCAR - California Climate Change Registry
 CO₂e - carbon dioxide equivalent
 gal - gallon
 lb - pound
 LCFS - Low Carbon Fuel Standard
 LPG - liquefied petroleum gas
 SANDAG - San Diego Association of Governments
 SF - square feet
 yr - year

Sources:

2007-2009 California Boater Survey. July 2011. Available online at: <http://www.coastal.ca.gov/ccbn/materialsforeducators.html>
 California Air Resources Board (CARB). 2006. Off-Road Emissions Inventory Program (OFFROAD2007). Available Online: <http://www.arb.ca.gov/msei/offroad/offroad.htm>
 California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
 San Diego Association of Governments (SANDAG). 2011. 2050 Regional Transportation Plan. Technical Appendix 2. Available online at: <http://www.sandag.org/uploads/2050RTP/F2050RTPA2.pdf>

Table E-10
2050 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Retail	-	Retail, Other Stores	112	employees	1,719	lb/employee	96	Paper/cardboard	32%	31	40%	43%	3	1	17	32	46
								Textiles	4%	4	24%	50%	0	0	2	3	
								Food waste	11%	11	15%	87%	1	0	5	8	
								Wood	13%	12	43%	23%	1	0	4	7	
								Garden and Park waste	2%	2	20%	28%	0	0	0	1	
Office	-	Large Office Buildings	37	1,000 square feet	1,866	lb/1,000 square feet	35	Paper/cardboard	50%	17	40%	43%	1	0	10	18	23
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	6	15%	87%	0	0	3	5	
								Wood	4%	1	43%	23%	0	0	0	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Restaurant	-	Full-Service Restaurant	687	employees	4,403	lb/employee	1,512	Paper/cardboard	17%	262	40%	43%	22	6	148	271	967
								Textiles	0%	6	24%	50%	0	0	2	4	
								Food waste	66%	1,000	15%	87%	65	17	429	785	
								Wood	1%	9	43%	23%	0	0	3	6	
								Garden and Park waste	0%	2	20%	28%	0	0	0	1	
Hotel/Lodging	Hotel - Rooms	Large Hotels	8,146	employees	3,903	lb/employee	15,897	Paper/cardboard	32%	5,135	40%	43%	439	115	2904	5313	9,836
								Textiles	4%	556	24%	50%	33	9	221	404	
								Food waste	36%	5,786	15%	87%	375	98	2483	4543	
								Wood	4%	588	43%	23%	29	8	195	357	
								Garden and Park waste	4%	668	20%	28%	19	5	123	225	
	Restaurant	Full-Service Restaurant	1,156	employees	4,403	lb/employee	2,545	Paper/cardboard	17%	440	40%	43%	38	10	249	456	1,627
								Textiles	0%	10	24%	50%	1	0	4	7	
								Food waste	66%	1,682	15%	87%	109	29	722	1321	
								Wood	1%	15	43%	23%	1	0	5	9	
								Garden and Park waste	0%	3	20%	28%	0	0	0	1	
	Meeting Area	Large Office Buildings	1,029	1,000 square feet	1,866	lb/1,000 square feet	960	Paper/cardboard	50%	483	40%	43%	41	11	273	499	638
								Textiles	6%	54	24%	50%	3	1	21	39	
								Food waste	18%	176	15%	87%	11	3	75	138	
								Wood	4%	40	43%	23%	2	1	13	24	
								Garden and Park waste	1%	6	20%	28%	0	0	1	2	
	Retail	Retail, Other Stores	398	employees	1,719	lb/employee	342	Paper/cardboard	32%	109	40%	43%	9	2	62	113	165
								Textiles	4%	15	24%	50%	1	0	6	11	
								Food waste	11%	38	15%	87%	2	1	16	30	
								Wood	13%	44	43%	23%	2	1	15	27	
								Garden and Park waste	2%	7	20%	28%	0	0	1	2	
	Office	Large Office Buildings	17	1,000 square feet	1,866	lb/1,000 square feet	16	Paper/cardboard	50%	8	40%	43%	1	0	5	8	11
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	18%	3	15%	87%	0	0	1	2	
								Wood	1%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Warehouse/Storage	-	Trucking & Warehousing	119	employees	3,800	lb/employee	226	Paper/cardboard	35%	79	40%	43%	7	2	45	82	108
								Textiles	6%	13	24%	50%	1	0	5	10	
								Food waste	4%	9	15%	87%	1	0	4	7	
								Wood	14%	31	43%	23%	2	0	10	19	
								Garden and Park waste	2%	5	20%	28%	0	0	1	2	
Museums	Museum	Services - Other Misc.	10	employees	1,800	lb/employee	9	Paper/cardboard	33%	3	40%	43%	0	0	2	3	5
								Textiles	11%	1	24%	50%	0	0	0	1	
								Food waste	13%	1	15%	87%	0	0	0	1	
								Wood	3%	0	43%	23%	0	0	0	0	
								Garden and Park waste	7%	1	20%	28%	0	0	0	0	
	Office	Large Office Buildings	0.20	1,000 square feet	1,866	lb/1,000 square feet	0	Paper/cardboard	50%	0	40%	43%	0	0	0	0	0
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	0	15%	87%	0	0	0	0	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	16	employees	1,719	lb/employee	14	Paper/cardboard	32%	4	40%	43%	0	0	2	5	7
								Textiles	4%	1	24%	50%	0	0	0	0	
								Food waste	11%	2	15%	87%	0	0	1	1	
								Wood	13%	2	43%	23%	0	0	1	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	19	employees	4,403	lb/employee	42	Paper/cardboard	17%	7	40%	43%	1	0	4	7	27
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	28	15%	87%	2	0	12	22	
								Wood	0%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
Classrooms	Elementary School	Services - Other Misc.	15	employees	1,800	lb/employee	14	Paper/cardboard	33%	4	40%	43%	0	0	3	5	7
								Textiles	11%	1	24%	50%	0	0	1	1	
								Food waste	13%	2	15%	87%	0	0	1	1	
								Wood	3%	0	43%	23%	0	0	0	0	
								Garden and Park waste	7%	1	20%	28%	0	0	0	0	
Rental Car ⁷	Retail	Retail, Other Stores	75	employees	1,719	lb/employee	64	Paper/cardboard	32%	20	40%	43%	2	0	12	21	31
								Textiles	4%	3	24%	50%	0	0	1	2	
								Food waste	11%	7	15%	87%	0	0	3	6	
								Wood	13%	8	43%	23%	0	0	3	5	
								Garden and Park waste	2%	1	20%	28%	0	0	0	0	

Table E-10
2050 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Yacht Clubs ⁶	Restaurant	Full-Service Restaurant	14	employees	4,403	lb/ employee	31	Paper/cardboard	17%	5	40%	43%	0	0	3	6	20
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	20	15%	87%	1	0	9	16	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Services - Other Misc.	2,337	slips	556	lb/ slip	649	Paper/cardboard	33%	216	40%	43%	18	5	122	223	331
								Textiles	11%	69	24%	50%	4	1	27	50	
								Food waste	13%	82	15%	87%	5	1	35	64	
								Wood	3%	21	43%	23%	1	0	7	13	
								Garden and Park waste	7%	46	20%	28%	1	0	8	16	
Marinas ⁸	Office	Large Office Buildings	32	1,000 square feet	1,866	lb/ 1,000 square feet	30	Paper/cardboard	50%	15	40%	43%	1	0	9	16	20
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	5	15%	87%	0	0	2	4	
								Wood	4%	1	43%	23%	0	0	0	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	6	employees	1,719	lb/ employee	5	Paper/cardboard	32%	2	40%	43%	0	0	1	2	2
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	0	
								Wood	13%	1	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	51	employees	4,403	lb/ employee	112	Paper/cardboard	17%	19	40%	43%	2	0	11	20	72
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	74	15%	87%	5	1	32	58	
								Wood	1%	1	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Services - Other Misc.	5,410	slips	556	lb/ slip	1,503	Paper/cardboard	33%	499	40%	43%	43	11	282	516	767
								Textiles	11%	159	24%	50%	10	2	63	116	
								Food waste	13%	189	15%	87%	12	3	81	149	
								Wood	3%	48	43%	23%	2	1	16	29	
								Garden and Park waste	7%	107	20%	28%	3	1	20	36	
Sport fishing ⁹	Restaurant	Full-Service Restaurant	4	employees	4,403	lb/ employee	9	Paper/cardboard	17%	2	40%	43%	0	0	1	2	6
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	6	15%	87%	0	0	2	5	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
	Slips	Manufacturing - Food / Kindred	75	slips	1,692	lb/ slip	63	Paper/cardboard	36%	23	40%	43%	2	1	13	24	36
								Textiles	6%	4	24%	50%	0	0	1	3	
								Food waste	22%	14	15%	87%	1	0	6	11	
								Wood	7%	4	43%	23%	0	0	1	3	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Commercial Sport fishing ⁹	Office	Large Office Buildings	13	1,000 square feet	1,866	lb/ 1,000 square feet	12	Paper/cardboard	50%	6	40%	43%	1	0	3	6	8
								Textiles	6%	1	24%	50%	0	0	0	0	
								Food waste	18%	2	15%	87%	0	0	1	2	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	6	employees	1,719	lb/ employee	5	Paper/cardboard	32%	2	40%	43%	0	0	1	2	2
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	0	
								Wood	13%	1	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Slips	Manufacturing - Food / Kindred	247	slips	1,692	lb/ slip	209	Paper/cardboard	36%	76	40%	43%	6	2	43	78	120
								Textiles	6%	12	24%	50%	1	0	5	9	
								Food waste	22%	47	15%	87%	3	1	20	37	
								Wood	7%	14	43%	23%	1	0	4	8	
								Garden and Park waste	1%	1	20%	28%	0	0	0	0	
Excursions ⁷	Retail	Retail, Other Stores	2	employees	1,719	lb/ employee	2	Paper/cardboard	32%	1	40%	43%	0	0	0	1	1
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	0	15%	87%	0	0	0	0	
								Wood	13%	0	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
	Restaurant	Full-Service Restaurant	5	employees	4,403	lb/ employee	11	Paper/cardboard	17%	2	40%	43%	0	0	1	2	7
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	7	15%	87%	0	0	3	6	
								Wood	1%	0	43%	23%	0	0	0	0	
								Garden and Park waste	0%	0	20%	28%	0	0	0	0	
Petroleum ⁷	Office	Large Office Buildings	2	1,000 square feet	1,866	lb/ 1,000 square feet	2	Paper/cardboard	50%	1	40%	43%	0	0	1	1	1
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	18%	0	15%	87%	0	0	0	0	
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	22	employees	1,719	lb/ employee	19	Paper/cardboard	32%	6	40%	43%	1	0	3	6	9
								Textiles	4%	1	24%	50%	0	0	0	1	
								Food waste	11%	2	15%	87%	0	0	1	2	
								Wood	13%	2	43%	23%	0	0	1	1	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	

Table E-10
2050 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Boatyards ¹⁰	Boatyards	Manufacturing - Industrial / Machinery	264	employees	400	lb/ employee	53	Paper/cardboard	37%	19	40%	43%	2	0	11	20	25
								Textiles	6%	3	24%	50%	0	0	1	2	
								Food waste	3%	2	15%	87%	0	0	1	1	
								Wood	9%	5	43%	23%	0	0	2	3	
								Garden and Park waste	4%	2	20%	28%	0	0	0	1	
	Office	Large Office Buildings	17	1,000 square feet	1,866	lb/ 1,000 square feet	16	Paper/cardboard	50%	8	40%	43%	1	0	4	8	10
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	18%	3	15%	87%	0	0	1	2	
								Wood	4%	1	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
	Retail	Retail, Other Stores	2	employees	1,719	lb/ employee	2	Paper/cardboard	32%	1	40%	43%	0	0	0	1	1
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	0	15%	87%	0	0	0	0	
								Wood	13%	0	43%	23%	0	0	0	0	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
Terminals	Office	Large Office Buildings	266	1,000 square feet	1,866	lb/ 1,000 square feet	248	Paper/cardboard	50%	125	40%	43%	11	3	71	129	165
								Textiles	6%	14	24%	50%	1	0	6	10	
								Food waste	18%	45	15%	87%	3	1	20	36	
								Wood	4%	10	43%	23%	1	0	3	6	
								Garden and Park waste	1%	1	20%	28%	0	0	0	1	
	Unrefrigerated Warehouse	Trucking & Warehousing	444	employees	3,800	lb/ employee	843	Paper/cardboard	35%	294	40%	43%	25	7	166	305	402
								Textiles	6%	50	24%	50%	3	1	20	36	
								Food waste	4%	34	15%	87%	2	1	14	26	
								Wood	14%	114	43%	23%	6	1	38	69	
								Garden and Park waste	2%	19	20%	28%	1	0	4	7	
	Refrigerated Warehouse	Trucking & Warehousing	295	employees	3,800	lb/ employee	561	Paper/cardboard	35%	196	40%	43%	17	4	111	202	267
								Textiles	6%	33	24%	50%	2	1	13	24	
								Food waste	4%	22	15%	87%	1	0	10	18	
								Wood	14%	76	43%	23%	4	1	25	46	
								Garden and Park waste	2%	13	20%	28%	0	0	2	4	
	Office/Unrefrigerated Warehouse/Cruise Ships	Services - Other Misc.	-	-	-	-	215	Paper/cardboard	33%	71	40%	43%	6	2	40	74	110
								Textiles	11%	23	24%	50%	1	0	9	17	
								Food waste	13%	27	15%	87%	2	0	12	21	
								Wood	3%	7	43%	23%	0	0	2	4	
								Garden and Park waste	7%	15	20%	28%	0	0	3	5	
Shipbuilding	-	Manufacturing - Industrial / Machinery	1,649	employees	400	lb/ employee	330	Paper/cardboard	37%	122	40%	43%	10	3	69	126	154
								Textiles	6%	20	24%	50%	1	0	8	14	
								Food waste	3%	10	15%	87%	1	0	4	8	
								Wood	9%	29	43%	23%	1	0	10	17	
								Garden and Park waste	4%	13	20%	28%	0	0	2	4	
								Paper/cardboard	50%	18	40%	43%	2	0	10	19	
								Textiles	6%	2	24%	50%	0	0	1	1	
								Food waste	18%	7	15%	87%	0	0	3	5	
								Wood	4%	2	43%	23%	0	0	1	1	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
Industrial	Office	Large Office Buildings	39	1,000 square feet	1,866	lb/ 1,000 square feet	36	Paper/cardboard	37%	1	40%	43%	0	0	0	1	24
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	3%	0	15%	87%	0	0	0	0	
								Wood	9%	0	43%	23%	0	0	0	0	
								Garden and Park waste	4%	0	20%	28%	0	0	0	0	
	General Industrial	Manufacturing - Industrial / Machinery	8	employees	400	lb/ employee	2	Paper/cardboard	37%	1	40%	43%	0	0	0	1	1
								Textiles	6%	0	24%	50%	0	0	0	0	
								Food waste	3%	0	15%	87%	0	0	0	0	
								Wood	9%	0	43%	23%	0	0	0	0	
								Garden and Park waste	4%	0	20%	28%	0	0	0	0	
	Food Processing	Manufacturing - Food / Kindred	467	employees	3,200	lb/ slip	747	Paper/cardboard	36%	271	40%	43%	23	6	153	281	429
								Textiles	6%	43	24%	50%	3	1	17	31	
								Food waste	22%	167	15%	87%	11	3	72	131	
								Wood	7%	49	43%	23%	2	1	16	29	
								Garden and Park waste	1%	1	20%	28%	0	0	0	0	
	Lumber Yards	Manufacturing - Lumber & Wood Products	172	employees	6,200	lb/ employee	533	Paper/cardboard	16%	87	40%	43%	7	2	49	90	261
								Textiles	21%	109	24%	50%	7	2	43	79	
								Food waste	1%	7	15%	87%	0	0	3	5	
								Wood	35%	185	43%	23%	9	2	61	112	
								Garden and Park waste	1%	3	20%	28%	0	0	1	1	
Port	General Port Office	Large Office Buildings	39	1,000 square feet	8,050	lb/ 1,000 square feet	302	Paper/cardboard	50%	152	40%	43%	13	3	86	157	200
								Textiles	6%	17	24%	50%	1	0	7	12	
								Food waste	18%	55	15%	87%	4	1	24	43	
								Wood	13%	13	43%	23%	1	0	4	8	
								Garden and Park waste	1%	2	20%	28%	0	0	0	1	
	General Port Warehouse	Trucking & Warehousing	1,585	employees	3,800	lb/ employee	3,046	Paper/cardboard	35%	1,063	40%	43%	91	24	601	1100	1,451
								Textiles	6%	180	24%	50%	11	3	71	131	
								Food waste	4%	122	15%	87%	8	2	52	96	
								Wood	14%	411	43%	23%	21	5	136	249	
								Garden and Park waste	2%	70	20%	28%	2	1	13	24	

Table E-10
2050 Inventory
Waste Emissions
San Diego Unified Port District

Tenant Type	Building Type ¹	Waste Profile	Activity Data ¹	Units	Waste Disposal Factor ²	Units	Waste Disposal (tons)	Degradable Waste Type	Percent of Waste Profile ³	Disposed Waste by Type (tons)	% DOC ⁴	% DANF ⁵	Generation (tons)	Methane Emissions (tons)	CO ₂ Emissions (tons)	CO ₂ e ⁶ (tons)	Total Emissions (metric tons CO ₂ e/yr)
Other Commercial ¹¹	Restaurant	Full-Service Restaurant	40	employees	4,403	lb/employee	88	Paper/cardboard	17%	15	40%	43%	1	0	9	16	56
								Textiles	0%	0	24%	50%	0	0	0	0	
								Food waste	66%	58	15%	87%	4	1	25	46	
								Wood	1%	1	43%	23%	0	0	0	0	
	Retail	Retail, Other Stores	73	employees	1,719	lb/employee	63	Garden and Park waste	0%	0	20%	28%	0	0	0	0	30
								Paper/cardboard	32%	2	40%	43%	0	0	1	3	
								Textiles	4%	0	24%	50%	0	0	0	0	
								Food waste	11%	1	15%	87%	0	0	0	1	
	Office	Large Office Buildings	-	-	-	-	2,562	Wood	13%	1	43%	23%	0	0	0	1	1,702
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
								Paper/cardboard	50%	2	40%	43%	0	0	1	2	
								Textiles	6%	0	24%	50%	0	0	0	0	
	Other	Services - Other Misc.	237	spaces	556	lb/space	66	Food waste	18%	1	15%	87%	0	0	0	1	34
								Wood	4%	0	43%	23%	0	0	0	0	
								Garden and Park waste	1%	0	20%	28%	0	0	0	0	
								Paper/cardboard	33%	22	40%	43%	2	0	12	23	
Other Industrial ¹²	-	Manufacturing - Industrial / Machinery	-	-	-	-	444	Textiles	11%	7	24%	50%	0	0	3	5	207
								Food waste	13%	8	15%	87%	1	0	4	7	
								Wood	3%	2	43%	23%	0	0	1	1	
								Garden and Park waste	7%	5	20%	28%	0	0	1	2	
	-	Trucking & Warehousing	10	employees	3800	lb/employee	19	Paper/cardboard	37%	164	40%	43%	14	4	93	170	9
								Textiles	6%	27	24%	50%	2	0	11	19	
								Food waste	3%	13	15%	87%	1	0	6	10	
								Wood	9%	39	43%	23%	2	1	13	23	
								Garden and Park waste	4%	17	20%	28%	0	0	3	6	
								Paper/cardboard	35%	7	40%	43%	1	0	4	7	
								Textiles	6%	1	24%	50%	0	0	0	1	
								Food waste	4%	1	15%	87%	0	0	0	1	
								Wood	14%	3	43%	23%	0	0	1	2	
								Garden and Park waste	2%	0	20%	28%	0	0	0	0	
Total																	20,439

Notes:

1. Since waste data is defined by building type, each tenant type is broken up into the different building types which best represent the tenant's land use(s). Activity data was proved for each building type by the Port of San Diego. See previous tables for the conversion of square footage into number of employees.
2. When not provided by the Port of San Diego or tenants, the Waste Disposal Factor is based on California Integrated Waste Management Board waste disposal data. See previous tables for details.
3. The Percent of Waste Profile for each degradable waste type is the fraction of the total waste disposed. See previous tables for details.
4. The Percent Degradable Organic Carbon (DOC) is the fraction of degradable carbon in each degradable waste type. Data for percent DOC is based on IPCC Guidelines. See previous tables for details.
5. The Percent Degradable Anaerobic Fraction (DANF) is the fraction of each degradable waste type that is capable of decomposition in anaerobic conditions. Data for percent DANF is based on California Air Resources Board data. See previous tables for details.
6. Represents the total carbon dioxide emissions plus methane emissions converted to carbon dioxide equivalents by a global warming potential factor of 21 based on CCAR 2009. Emission estimates follow CalEEMod guidance and account for an oxidation efficiency of methane of 10%, a destruction efficiency of landfill gas of 98%, and a collection efficiency of landfill gas of 80% per the San Diego County GHG Inventory.
7. Other than the land uses defined in this table, waste from these facilities was assumed to be minimal.
8. Yacht club and marina emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
9. Sport fishing and Commercial Sport fishing emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by # of slips.
10. Boatyard emissions were calculated based on a metric developed from participating representative tenants. The metric was normalized by parcel area of the boatyards.
11. Other Commercial includes commercial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative waste data.
12. Other Industrial includes industrial tenants which did not fit into the categories presented above. Emissions were estimated using activity data and representative waste data.

Abbreviations:

CalEEMod - California Emissions Estimator Model
 CCAR - California Climate Action Registry
 CO₂ - carbon dioxide
 CO₂e - carbon dioxide equivalent
 DANF - Degradable anaerobic fraction
 DOC - Degradable Organic Carbon
 GHG - greenhouse gas
 IPCC - Intergovernmental Panel on Climate Change
 lb - pound

Sources:

California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1. Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3_1_January2009.pdf
 CalEEMod. California Emissions Estimator Model. Available online at: <http://www.caleemod.com/>
 San Diego County Greenhouse Gas Inventory. September 2008. Prepared by the University of San Diego and EPIC. Available online at: <http://www.sandiego.edu/epic/ghginventory/>

Table E-11
2050 Inventory
Emissions from Maritime Activities
San Diego Unified Port District

Sector	2006	2050 Projections	2050 Projections - with Regulations ⁴
	Total Emissions (metric tons CO ₂ e/yr)		
Ocean Going Vessels ¹	55,162	131,033	109,280
Cargo Handling Equipment ²	4,039	9,839	9,082
Commercial Harbor Craft	20,835	24,980	22,482
Locomotive ²	3,085	7,515	6,763
Heavy Duty Vehicles ²	29,343	71,482	59,944
Cruise Terminal Transportation ³	3,830	8,833	6,055
Total	116,294	253,682	213,606

Notes:

1. Cargo growth through 2050 was projected based on data provided by the San Diego Unified Port District Maritime Business Plan (3% annually from 2035). Cargo growth was capped at terminal capacities. Cruise growth from 2035 to 2050 was estimated based on the San Diego Unified Port District Cruise Market Update (16%). Since cruise growth was only projected through 2040, this was assumed to be representative of 2050.
2. Cargo handling equipment, assist tugs, ocean tugboats, locomotive, and heavy duty vehicle emissions are expected to increase in proportion to the cargo activity, since these are all supporting services.
3. Cruise terminal transportation emissions are expected to increase in proportion to the cruise ship activity, since it is a supporting service.
4. Reductions due to Shorepower and Fuel Switch regulations were applied to applicable Ocean Going Vessels. A 10% reduction due to LCFS was applied to Cargo Handling Equipment, Locomotives, Heavy Duty Vehicles, and Cruise Terminal Transportation. Reductions due to the Heavy Duty (Tractor-Trailer) GHG Regulation were applied to Heavy Duty Vehicles and reductions due to Pavley standards were applied to the applicable portion of the Cruise Terminal Transportation fleet.

Abbreviations:

CARB - California Air Resources Board
CO₂e - carbon dioxide equivalent
GHG - greenhouse gas
LCFS - Low Carbon Fuel Standard
yr - year

Sources:

California Air Resources Board (CARB). Ocean-going Vessels - Fuel Rule. Available online at:
<http://www.arb.ca.gov/ports/marinevess/ogv.htm>
California Air Resources Board (CARB). Shore Power for Ocean-going Vessels. Available online at:
<http://www.arb.ca.gov/ports/shorepower/shorepower.htm>
San Diego Unified Port District Maritime Business Plan. December 2008. Figure 4.4-1 Cargo Projections, Current Markets
San Diego Unified Port District, Cruise Market Update. June 2011. Figure 23 - Port of San Diego Passenger Growth Composite, 2000-2040
The Port of San Diego 2006 Emissions Inventory. March 2008. Prepared by Starcrest Consulting Group, LLC. Available online at:
http://sandiegohealth.org/port/2006_emissions_inventory_final.pdf

Appendix C - Greenhouse Gas Reduction Measures

C.1 Introduction

The San Diego Unified Port District's (the Port's) staff and the Port's Climate and Energy Work Group (Work Group) produced a comprehensive list of potential greenhouse gas (GHG) reduction measures in 2011 and 2012 that were evaluated during the development of the Port's Climate Action Plan. In 2013, the Port held a series of Board Workshops on the Climate Action Plan. During these workshops, the Port's Commissioners provided direction to staff on overarching policies for these measures as well as some reorganization of the original measures under these overarching policies. The Port's Commissioners and the public also provided feedback on additional measures to be included in the Climate Action Plan. These changes from the 2013 Board Workshops are reflected in the main report. This appendix focuses on measures gathered and organized prior to 2013.

Board of Port Commissioners Policy 750 establishes a process for future updates to the list of reduction measures and their categorization and prioritization. Each reduction measure was preliminarily evaluated against each of the 12 criteria based on best available data, information, best practices, and experienced professional judgment by Port staff and the Port's consulting team of ENVIRON, MIG, and Chambers Group (the "ENVIRON Team"). Discussion of evaluation criteria definitions and parameters for the relative, qualitative categorization of each reduction measure as typically conducted in Climate Action Plans developed elsewhere is also described.

The process of identifying and evaluating reduction measures presented here and in Board Policy 750 is consistent with the fourth California Environmental Quality Act (CEQA) Guideline element for climate action planning under §15183.5, as discussed in Appendix A (the Climate Action Plan's relationship to CEQA).

C.2 Development of the List of Applicable Reduction Measures

The reduction measures included in the Climate Action Plan were chosen through research and review of climate action planning resources and GHG mitigation plans with review by Port staff and the Work Group.

Port staff and the ENVIRON Team first produced a comprehensive list of potential reduction measures to be evaluated for possible inclusion in the Climate Action Plan. These measures were drawn from over a dozen CAPs and GHG emission reduction guidelines completed by local governments and agencies in California, including those for similar organizations including ports and airports.

The ENVIRON Team and Port staff solicited feedback on the original list from the Work Group and received suggestions for additional measures (see Appendix G). The Port reviewed the complete list and revised some measures to consolidate similar ideas and

provide more specificity for evaluation efforts. A “crosswalk key” that documented how draft measures were combined or modified was presented to the Work Group, so that Work Group and community members could track their ideas as the draft list was refined into a consolidated list that was used to evaluate reduction measures described below.

Port staff also relied on guidance and resources provided at the state and regional level, including those from the California Air Pollution Control Officers Association (CAPCOA), San Diego Gas and Electric (SDG&E) and the San Diego Association of Governments (SANDAG). Measures were also drafted or refined based on industry-specific resources, including the International Association of Ports and Harbors (IAPH). A full list of sources is included at the end of this appendix.

C.3 Reduction Measure Evaluation Process

The ENVIRON Team and Port staff collaborated on developing an initial list of 12 criteria to help the Port preliminarily categorize and prioritize GHG reduction measures in the Climate Action Plan. For each criterion, parameters and weights were developed to allow each measure to be categorized and scored. The list of criteria, their definitions, and the categorization parameters are shown in Table C-1.

Table C-1. Measure Evaluation Criteria

CRITERION	DEFINITION	CATEGORIZATION PARAMETERS
Authority	The ability of the Port as an entity to request, require and/or implement measures.	Yes No
Cost effectiveness	Estimated cost per metric ton of emissions reductions. Cost effectiveness partly evaluated based on the “Global Greenhouse Gas Abatement Cost Curve” published by McKinsey & Company which prioritizes as follows: 1) Energy Efficiency, 2) Low Carbon Energy Supply, 3) Terrestrial Carbon, and 4) Behavior Change.	High - most cost-effective measures Moderate - moderately cost-effective measures Low - least cost-effective measures
Cost	A qualitative indication of the relative expense of the measure. Includes consideration of potential costs and savings to the Port, its tenants and users. Considers up-front investment and activation costs as well as operations, maintenance and life-cycle costs.	\$ - low relative cost \$\$ - moderate relative cost \$\$\$ - high relative cost
Potential funding	The overall availability of funding sources and financing strategies to offset costs to the Port and Port tenants and users.	Currently funded - funding strategies are well established Potential - potential for funding exists Unknown - funding support unlikely or unknown prior to 2020
Implementability	Is the measure compatible with current or planned Port systems, resources and operations? Also, does the measure satisfy or conflict with other laws, regulations, guidelines or recommendations?	High - already underway or implementable without requiring an adoption of new plans or policies. Moderate - possible or straightforward to implement Low - difficult to implement
Measurable results	The ability to measure the GHG reduction performance of each measure over time. This includes the availability of data, the ability to isolate the impact of each measure, the level and cost of effort to assess the impact, and the existence of established tools or cost effective methodologies to track performance.	Yes - Results are highly measurable Possible - Results are somewhat measurable Difficult - Results are difficult to measure

CRITERION	DEFINITION	CATEGORIZATION PARAMETERS
Key measure	Measures that target the largest emissions sources of the Port's inventory and/or have high reduction, penetration, and/or participation potential. Key measures must also be considered quick wins or require minimal planning.	✓ - identified as key to meeting 2020 goal
Time frame	The year GHG reductions are counted toward the Port's quantified emissions reduction goal. The planning and implementation of the measures may already be underway or completed prior to the year the reductions are counted toward the goal.	2020 - reductions are expected to occur by 2020 2035 - reductions are expected to occur after 2020 and before 2035 2050 - reductions may occur by 2050
Reduction potential	A relative, qualitative characterization of estimated annual emission reductions once measure is fully implemented. Reduction potential will take into account the relative size of the component of the Port's future GHG inventory that the measure would apply towards, relative to other measures.	High - highest relative GHG reduction impact Moderate - moderate relative GHG reduction impact Low - small relative GHG reduction impact Supporting - no or unknown reduction in itself, but would support another measure
Technical feasibility	Assesses the availability and proven effectiveness of technology, processes or methods.	High - measure is highly feasible Moderate - measure is feasible Low - measure is least feasible
Existing Contractual Agreement, State or Federal Law	Measures that support an existing regulation or contractual agreement.	Yes - supports regulation or commitment No - does not support regulation or commitment
Co-benefits	Other important social, economic or environmental benefits that may be realized as a result of implementing a measure.	<ul style="list-style-type: none"> • Air quality improvements (AQ) • Adaptation strategy support (AD) • Economic and job benefits (EB) • Energy conservation or generation (EN) • Land use plan implementation (LU) • Natural habitat protection or restoration (NH) • Public health improvement (PH) • Resource conservation (RC) • Regional plan implementation (RP) • Transportation system improvement (TR) • Water quality improvement (WQ)

The parameters allowed for the relative, qualitative categorization and preliminary prioritization of each reduction measure, a typical method used in California CAPs.

Each measure was evaluated against each of the 12 criteria based on available data and information, best practices, and experienced professional judgment of Port staff and the ENVIRON Team. Information on cost, cost effectiveness and reduction potential for some measures was based on the cost curve developed in the McKinsey report: “Reducing US GHG Emissions: How Much at What Cost?”¹ as well as the IAPH Tool Box for Port Clean Air Programs.² While some criteria information, such as the cost and cost effectiveness, for most measures is qualitative in nature and based on existing literature resources, it was sufficient to evaluate reduction measures applicable to Port operations and to categorize them. Further data collection and development of more refined cost and cost effectiveness information (as well as other parameters) will be performed during development of the reduction measures in the implementation phase of the Climate Action Plan, as described in Appendix F.

The reduction measures were evaluated based on the following hierarchy of data:

1. Documented available data and information
 - a. Port-specific studies
 - b. Existing climate action plans (quantitative analysis)
 - c. Other technical GHG emission reduction studies
2. Best practices or professional judgment
 - a. Existing climate action plans (qualitative analysis)
 - b. Climate planning resource guides
 - c. Professional experience

C.4 Results of Reduction Measure Evaluation

The Draft Reduction Measures and Evaluation shown in Table C-3 is a comprehensive compilation of possible measures from other CAPs, agency documents, and public comments, as referenced at the end of this document. These measures were evaluated by the ENVIRON Team according to the criteria and parameters described above. As mentioned previously (section C.3) some similar or related measures were consolidated. Supportive measures are shown below each main reduction measure (identification codes are in lower case letters) and are not individually evaluated. This is because these supportive measures represent specific measures that can be implemented to

¹ McKinsey. 2007. Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost? December. Available at: http://www.mckinsey.com/client_service/sustainability/latest_thinking/reducing_us_greenhouse_gas_emissions Accessed July 23, 2012

² IAPH 2007. Tool Box for Port Clean Air Programs: Improving Air Quality While Promoting Business Development. Available at <http://www1.iaphworldports.org/toolbox%201/DRAFT%20IAPH%20TOOL%20BOX%20case%20studies%20all.pdf> Accessed April 19, 2012

realize the main reduction measure. For example, Passive Solar Design (ID: eb1.2) can be incorporated into the green building standards for new construction (ID: EB1). The list shown in Table C-3 was used in Appendix E to evaluate the combination of reduction measures that would be needed to assist the Port in reaching its reduction targets. Measures received and incorporated during the final review process of the Climate Action Plan may not be included in the analysis but any additional measures are assumed to increase expected reductions. An updated analysis will be done during implementation of the Climate Action Plan.

C.5 References Used to Develop List of GHG Reduction Measures

Climate Action Plans

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- County of Napa, 2009. Draft Napa Countywide Community Climate Action Plan, October. http://www.coolplan.org/napa_ca.php Accessed April 17, 2012
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<http://www.polb.com/civica/filebank/blobdload.asp?BlobID=6344> Accessed April 17, 2012

San Diego Association of Governments, 2010. Climate Action Strategy, March.
<http://www.sandag.org/index.asp?projectid=337&fuseaction=projects.detail>
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San Francisco International Airport, 2010. SFO Climate Action Plan, February.
<http://www.flysfo.com/downloads/SFOClimateActionPlan2010.pdf> Accessed April 17, 2012

Other Sources

California Air Pollution Control Officers Association (CAPCOA), 2009. Model Policies for Greenhouse Gases in General Plans, A Resource for Local Government to Incorporate General Plan Policies to Reduce Greenhouse Gas Emissions, June.

California Air Pollution Control Officers Association (CAPCOA), 2010. Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August.

Coalition for Clean Air. 2011. Shipping Clean Growing Green, How Companies are earning more by polluting less at California Ports. May.

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IAPH Tool Box for Port Clean Air Programs: Improving Air Quality While Promoting Business Development. 2007.
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National Cooperative Freight Research Program (NCFRP), 2011. Report 11 Truck Drayage Productivity Guide.

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San Diego Association of Governments, 2009. Regional Energy Strategy.
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San Diego Gas and Electric (SDG&E). 2009. Draft San Diego Unified Port District
Energy Road Map. February 19.

Table C-3 to Appendix C**
Reduction Measures and Evaluation
San Diego Unified Port District

		Port Authority	Cost Effectiveness	Cost	Potential Funding	Implementability	Measurable Results	Key Measure	Timeframe	Reduction Potential	Technical Feasibility	Existing Contractual Agreement, State or Federal Law	Co-benefits
ENERGY													
EB	Building Energy Use												
EB1	Establish green building standards and/or policy for new construction.	Direct	High	\$\$	Potential	Moderate	Yes	✓	2020	Moderate	High	Yes	AQ, EN, PH, WQ
eb1.1	New construction policy should mirror the city of Chula Vista’s policy for new construction to ensure that the buildings of the future will use less energy.												
eb1.2	Passive Solar Design: Use passive solar design features, such as daylighting and passive solar heating. New development can be arranged and oriented to maximize effective use of passive solar energy.												
eb1.3	Solar-Ready Buildings: New buildings to be constructed to allow for easy, cost-effective installation of solar energy systems in the future, using such “solar-ready” features as: * optimal roof orientation * clear access * roof framing to support addition of solar panels * electrical conduit to accept electric system wiring * plumbing to support solar hot water system												
EB2	Establish green building standards and/or policy for existing buildings.	Direct	High	\$\$	Potential	Moderate	Yes	✓	2020	Moderate	High	Yes	AQ, EN, PH, WQ
EB3	Develop energy efficiency performance standards that achieve a greater reduction in energy use than otherwise required by state law.	Direct	High	\$\$	Potential	Moderate	Yes	✓	2020	Moderate	High	Yes	AQ, EN
eb3.1	Installation of occupancy sensors.												
eb3.2	Use of Server Virtualization for computing server needs.												
eb3.3	Installation of new boiler controls and condensing economizers.												
eb3.4	Installation of programmable thermostat timers.												
eb3.5	Obtain 3rd-party HVAC commissioning and verification of energy savings.												
eb3.6	Install energy efficient appliances.												
eb3.7	Installation of tankless water heating units.												
eb3.8	Installation of advanced guest room controls to control energy usage in unoccupied rooms.												
EB4	Establish program/policy to encourage retrofit of existing buildings to reduce energy use.	Direct	High	\$\$	Potential	Moderate	Yes	✓	2020	Moderate	High	Yes	AQ, EN
eb4.1	Establish a phased and measured ‘audit then retrofit’ approach directed at the highest ‘bang for the buck’ units first, e.g. most energy inefficient or highest users first.												
EB5	Energy Efficiency Funding: Increase awareness and coordinate use of incentives for tenants to invest in energy efficiency upgrades.	Direct	na	\$	Current	High	Difficult	✓	2020	Supporting	High	Yes	EN
EB7*	Enforce the requirements of AB1103 requiring owners of nonresidential buildings in CA to measure and report to the California Energy Commissions the building’s energy use via U.S. EPA Energy Star Portfolio Manager and disclose the information to prospective buyers, lessees, and lenders. The Port will also require public disclosure.	Direct	Moderate	\$	Potential	Moderate	Possible		2020	Low	High	Yes	EN, RC

Table C-3 to Appendix C**
Reduction Measures and Evaluation
San Diego Unified Port District

		Port Authority	Cost Effectiveness	Cost	Potential Funding	Implementability	Measurable Results	Key Measure	Timeframe	Reduction Potential	Technical Feasibility	Existing Contractual Agreement, State or Federal Law	Co-benefits
EA	Alternative Energy Generation												
EA1	Implement on-site renewable energy generation policy for 2020 (solar power, wind power, methane recovery, wave power etc.).	Direct	High	\$\$	Potential	Moderate	Yes	✓	2020	Moderate	High	No	AQ, EB, EN
EA2	Implement on-site renewable energy generation policy for 2035 (solar power, wind power, methane recovery, wave power etc.).	Direct	Moderate	\$\$\$	Potential	Moderate	Yes		2035	High	High	No	AQ, EB, EN
EA3	Implement on-site renewable energy generation policy for by 2050 (solar power, wind power, methane recovery, wave power etc.).	Direct	Low	\$\$\$	Potential	Moderate	Yes		2050	High	High	No	AQ, EB, EN
EA4	Establish policies and programs that facilitate the siting of new renewable energy generation.	Direct	na	\$	Potential	High	Difficult	✓	2020	Supporting	High	Yes	EB, EN
EA5	Remove Barriers: Identify and remove or reduce barriers to renewable energy production, including: * Review and revise building and development codes, design guidelines, and zoning ordinances to remove barriers. * Work with related agencies, such as fire, water, health and others that may have policies or requirements that adversely impact the development or use of renewable energy technologies.	Indirect	na	\$	Potential	Moderate	Difficult		2020	Supporting	High	No	AQ, EB, EN
EA6	Pursue economic incentives and creative financing for renewable energy projects (such as a Solar Cooperative Purchasing Policy), as well as other support for tenants or developers seeking funding for such projects.	Direct	na	\$	Potential	High	Difficult	✓	2020	Supporting	High	Yes	AQ, EB, EN
EA7	Promote co-generation (i.e., combined heat and power system) projects.	Direct	na	\$	Potential	High	Difficult		2020	Supporting	High	Yes	EB, EN
EA8	Encourage the implementation of methane recovery systems that generate energy for use at landfills used by tenants.	Direct	na	\$	Potential	High	Difficult		2020	Supporting	High	No	AQ, EN
EA9	Reduce costs to permit alternative energy generation projects.	Indirect	na	\$	Potential	High	Difficult	✓	2020	Supporting	High	No	EN
EA10	Develop clean, fuel cell distributed generation within Port Tidelands.	Indirect	Low	\$\$\$	Unknown	Moderate	Yes		2050	High	Moderate	No	AQ, EN, RC
EA11*	Implement a program to install technologies for generating energy from renewable sources such as solar power, wind power, and/or wave power on Port Tidelands. Establish progressively more ambitious production goals for the years 2020, 2035, and 2050.	Indirect	Moderate	\$\$\$	Unknown	Low	Yes		2020	High	High	No	AQ, EN, RC

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		Port Authority	Cost Effectiveness	Cost	Potential Funding	Implementability	Measurable Results	Key Measure	Timeframe	Reduction Potential	Technical Feasibility	Existing Contractual Agreement, State or Federal Law	Co-benefits
EH	Heat Gain and Shading												
EH1	Adopt a Heat Island Mitigation Plan that uses cool roofs, cool pavements, and strategically placed shade trees, and actively inspect and enforce state requirements for cool roofs on non-residential re-roofing projects.	Direct	High	\$\$	Potential	Moderate	Difficult	✓	2020	Moderate	High	No	AQ, AD, EN
eh1.1	Shading Requirement: New development and large redevelopment or rehabilitation (for example, additions of more than 25,000 square feet commercial or 100,000 square feet industrial) to reduce exterior heat gain for 50% of non-roof impervious site landscape (roads, sidewalks, courtyards, parking lots, and driveways), including: * Paved surface shading with vegetation * Paving materials with high Solar Reflective Index * Covered parking with high Solar Reflective Index												
eh1.2	Shade Tree Planting Standards: Establish shade tree guidelines and specifications												
EH2	Urban Forestry Management: Develop an Urban Forestry Program to consolidate policies and ordinances regarding tree planting, maintenance, and removal, including: * comprehensive inventory and analysis of the urban forest. * tree-planting target and schedule to support goals of the California Climate Action Team to plant 5 million trees in urban areas by 2020. * Establish guidelines for tree planting (deciduous vs. evergreen, low-VOC-producing trees, drought-tolerant native trees and vegetation).	Indirect	Moderate	\$\$	Potential	Moderate	Possible		2020	Low	High	No	AQ, AD, NH
EH3	Evaluate existing landscaping and options to convert reflective and impervious surfaces to landscaping, and install or replace vegetation with drought-tolerant, low-maintenance native species that can also provide shade and reduce heat-island effects.	Direct	Moderate	\$\$	Potential	High	Difficult		2020	Low	High	Yes	AQ, RC
EL	Lighting												
EL1	Develop and implement performance standards for exterior lighting of commercial and industrial buildings and parking lots, which include minimum and maximum lighting levels while providing a safe environment.	Direct	High	\$	Potential	High	Possible	✓	2020	Low	High	Yes	EN
EL2	Require the replacement of traffic lights with LED traffic lights.	Direct	High	\$	Current	High	Yes		2020	Low	High	No	EN
EL3	Install occupancy sensors (Vending Misers) at soda machines.	Direct	High	\$	Current	High	Yes		2020	Low	High	No	EN
EL4	Replace light fixtures in Port owned facilities with lower energy bulbs such as fluorescent, LEDs, or CFLs.	Direct	High	\$\$	Potential	High	Yes	✓	2020	Moderate	High	Yes	EN
EL5	Replace light fixtures in non-Port facilities with lower energy bulbs such as fluorescent, LEDs, or CFLs. (Measure ID changed to EB6 in final CAP)	Indirect	High	\$\$	Potential	Moderate	Yes	✓	2020	Moderate	High	Yes	EN

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		Port Authority	Cost Effectiveness	Cost	Potential Funding	Implementability	Measurable Results	Key Measure	Timeframe	Reduction Potential	Technical Feasibility	Existing Contractual Agreement, State or Federal Law	Co-benefits
TRANSPORTATION													
TL	Land Use/Community Design and Transit System Improvements												
TL1	Promote infill and higher intensity development. (Measure ID changed to TL1 in final CAP)	Direct	Moderate	\$	Potential	Moderate	Difficult	✓	2035	Low	High	No	AQ, AD, LU, PH, RP, TR
TL2	Promote greater linkage between land uses and transit, as well as other modes of transportation. (Measure ID changed to TL1 in final CAP)	Indirect	Moderate	\$	Potential	Moderate	Difficult	✓	2035	Low	High	No	AQ, AD, LU, PH, RP, TR
TL3	Increase bicycling and walking opportunities (safe infrastructure to priority destinations) as an alternative to driving. (Measure ID changed to TL2 in final CAP)	Direct	Moderate	\$	Potential	Moderate	Difficult	✓	2020	Low	High	No	AQ, AD, LU, PH, RC, RP, TR
TL4	Drive-Through Uses: Restrict the locations of drive-through businesses to reduce the impacts of vehicle idling on adjacent uses, such as housing, schools, and health care facilities. (Measure ID changed to TL3 in final CAP)	Direct	Moderate	\$	Potential	High	Difficult		2020	Low	High	No	AQ, LU, PH, RC
TT1	Encourage expansion of the transit network; both passenger transit and rail freight transportation.	Indirect	Moderate	\$	Potential	Moderate	Difficult	✓	2020	Low	High	No	AQ, LU, RC, RP, TR
TT2	Encourage increased transit performance (e.g., frequency and speed).	Indirect	Moderate	\$	Potential	Moderate	Difficult	✓	2020	Low	High	No	AQ, TR
TT3	Encourage implementation of transit access improvements.	Indirect	Moderate	\$	Potential	Moderate	Difficult	✓	2020	Low	High	No	AQ, LU, RC, RP, TR
TP	Parking Policy/Pricing and Trip/Vehicle Miles Reduction												
TP1	Adopt a comprehensive parking policy to unbundle the true cost of providing parking. This policy will increase economic fairness while it reduces the frequency of people choosing to drive alone to work.	Direct	Moderate	\$	Potential	Moderate	Difficult	✓	2020	Low	High	No	AQ, RC, RP
tp1.1	Use parking pricing to discourage private vehicle use, especially at peak times.												
tp1.2	Reduce the available parking spaces for private vehicles while increasing parking spaces for shared vehicles, bicycles, and other alternative modes of transportation.												
tp1.3	Use parking pricing to discourage private vehicle use, especially at peak times.												
TP2	Event Parking Policies. Use the approach outlined in reference for event parking policies. The car parking should be operated as a business for the people of driving age that attend the events. Reference: www.sandiego.gov/enviroenemtnal-services/pdf/sustable/parkingcosts.pdf .	Direct	Moderate	\$	Potential	Moderate	Difficult	✓	2020	Low	High	No	AQ, RC, RP
TV1	Implement trip reduction programs such as: * ride sharing * telecommuting and alternative work schedules * commute trip reduction marketing * employer-sponsored vanpool/shuttle	Indirect	Moderate	\$	Potential	Moderate	Possible	✓	2020	Low	High	No	AQ, RC

Table C-3 to Appendix C**
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		Port Authority	Cost Effectiveness	Cost	Potential Funding	Implementability	Measurable Results	Key Measure	Timeframe	Reduction Potential	Technical Feasibility	Existing Contractual Agreement, State or Federal Law	Co-benefits
TR	Roadway System Management												
TR1	Implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions on general roadways within Port tidelands.	Indirect	Moderate	\$\$	Potential	Moderate	Difficult	✓	2035	Low	High	No	AQ, RC, TR
TR2	Implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions at maritime facilities.	Direct	Moderate	\$\$	Potential	High	Difficult	✓	2020	Low	High	No	AQ, TR
tr2.1	Promote fuel-efficient, “eco-driving” practices such as reducing idling, slower driving speeds, gently accelerating, and proper tire inflation, as a new driver education program or as part of existing programs												
tr2.2	Shift heavy duty truck operations from peak hours during the daytime to off peak hours during the nighttime and weekends to reduce traffic congestion												
tr2.3	Port Trucks - Convert to two-stage terminal entry gate system (or equivalent capabilities) to segregate and handle exceptions without delaying routine transactions.												
tr2.4	Port Trucks - Implement the use of technologies, such as OCR or RFID, where feasible to automate, streamline, and routinize terminal gate processing and reduce delays and idling time.												
tr2.5	Port Trucks - Extend gate hours to accommodate peaking and reduce delays.												
tr2.6	Port Trucks - Eliminate gate closures to reduce delays and idling (e.g., lunch or other breaks).												
tr2.7	Port Trucks - Implement appointment systems to make terminal transactions more predictable and reduce gate and container yard congestion.												
tr2.8	Port Trucks - Implement terminal information systems to ensure that import containers are ready to be picked up.												
tr2.9	Port Trucks - Implement a system of neutral chassis pools or trucker-supplied chassis to streamline in-terminal chassis logistics.												
tr2.10	Port Trucks - Institute a program to proactively maintain and flag defective chassis in terminal pools.												
tr2.11	Compliance with California Drayage truck rule engine standards for other, non-drayage heavy-duty trucks used by the Port or Port tenants												
TR3	Vehicle Idling: Enforce State idling laws for commercial vehicles, including delivery and construction vehicles.	Direct	High	\$	Potential	Moderate	Possible	✓	2020	Low	High	Yes	AQ
TR4	Encourage rail freight utilization over trucks to reduce vehicle miles traveled.	Indirect	Moderate	\$	Potential	High	Possible	✓	2020	Low	High	No	AQ, RC, TR

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		Port Authority	Cost Effectiveness	Cost	Potential Funding	Implementability	Measurable Results	Key Measure	Timeframe	Reduction Potential	Technical Feasibility	Existing Contractual Agreement, State or Federal Law	Co-benefits
TA	Alternative Powered Vehicles and Vessels and Advanced Technologies												
TA1	Support and promote the use of alternate fueled, electric or hybrid Port owned vehicles and vessels (also includes cargo handling equipment, terminal and stationary equipment).	Direct	Moderate	\$\$	Potential	High	Yes	✓	2020	Low	High	Yes	AQ, RC
TA2	Support and promote non-Port owned vehicles and vessels to achieve the lowest emissions possible, using a mix of alternative fueled, electric or hybrid technology.	Indirect	High	\$\$	Potential	Moderate	Yes	✓	2020	Moderate	High	No	AQ, RC
ta2.1	New developments to provide prioritized parking for electric vehicles and vehicles using alternative fuels.												
ta2.2	Encourage the use of shared electric vehicles and similar low-carbon mobility options as alternatives to the private automobile.												
TA3	Implement emissions reduction strategies at loading docks through electrification of docks or idling-reduction systems for use while at loading docks.	Direct	Low	\$\$\$	Potential	Moderate	Possible		2035	Low	Moderate	No	AQ, RC
TA4	Electrification of marinas	Indirect	Moderate	\$\$\$	Potential	Low	Possible		2035	Moderate	High	No	AQ, PH
TA5	Develop and encourage use of shore power for ocean going vessels	Indirect	High	\$\$\$	Potential	High	Yes		2020	High	High	Yes	AQ, PH
TA6	Develop and encourage use of shore power for tugs	Indirect	High	\$\$	Potential	Moderate	Yes		2035	High	High	No	AQ, PH
TA7	Promote the use of catenary/Induction-Driven Trucks for transporting cargo between the Port terminals and intermodal rail yards, distribution centers, and warehouses.	Direct	Low	\$\$\$	Unknown	Low	Possible		2035	Low	Moderate	No	AQ, EN, RC, TR
TA8	Promote the use of alternative container transport systems such as Maglev to eliminate diesel-powered rail and truck transport to near-dock rail facilities.	Direct	Low	\$\$\$	Unknown	Low	Possible		2050	Moderate	Low	No	AQ, RC, TR
TE1	Use technologies and strategies to reduce fuel consumption such as installation of electronic engine and fuel management systems, to reduce fuel consumption and operate cleaner vessel engines.	Indirect	High	\$\$	Potential	Moderate	Yes		2035	High	High	No	AQ, PH, RC
TE2	Implement Vessel Speed Reduction for ocean going vessels	Direct	Moderate	\$	Potential	High	Possible		2020	Low	High	No	AQ, PH, RC
TE3	Implement anti-idling restrictions for locomotives	Direct	Moderate	\$	Potential	High	Yes		2020	Low	High	No	AQ, PH, RC
TE4	Promote best vehicle maintenance and operational best practices for Harbor Craft, including routine engine monitoring.	Indirect	Moderate	\$	Unknown	Moderate	Possible		2020	Low	High	No	AQ, EB, PH
TE5	Promote the application of advanced hull and propeller design in new ships and air cavity systems to reduce hull resistance.	Indirect	High	\$\$	Unknown	Low	Possible		2035	High	Moderate	No	AQ, PH, RC
TE6	Promote the use of flywheel technology for non-electric cranes.	Indirect	Moderate	\$	Unknown	Moderate	Possible		2020	Low	High	No	AQ, PH, RC
TE7	Support and promote the use of advanced technologies for rail locomotives: * advanced technology diesel-fuel injectors * Tier 2 or Tier 3 locomotive engines * gen-set engines * hybrid or LNG locomotives	Indirect	Low	\$\$\$	Potential	Moderate	Yes		2035	Low	Moderate	No	AQ, PH, RC
TE8	Solar power generators or alternative power generation systems for ocean going vessels to supply on-board electrical demand and propulsion.	Indirect	Moderate	\$\$\$	Unknown	Low	Yes		2035	High	Moderate	No	AQ, EN, PH, RC, WQ

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		Port Authority	Cost Effectiveness	Cost	Potential Funding	Implementability	Measurable Results	Key Measure	Timeframe	Reduction Potential	Technical Feasibility	Existing Contractual Agreement, State or Federal Law	Co-benefits
TE9*	Evaluate the feasibility of using hydraulic/electric cranes at the marine terminals and industrial waterfront businesses to reduce diesel emissions.	Direct	Moderate	\$	Unknown	Moderate	Possible		2020	Low	High	No	AQ, PH, RC
TE10*	Explore the consolidation of waste haulers servicing businesses on tidelands.	Indirect	Low	\$	Unknown	Low	Difficult		2020	Low	High	No	AQ, RC
WATER													
WR	Water Recycling												
WR1	Recycled Water Use: Establish programs and policies to increase the capture and use of recycled water	Indirect	Moderate	\$\$	Potential	Low	Possible		2020	Low	High	No	AD, EN, RC
wr1.1	Gray Water System Standards: Promote criteria and standards to permit the safe and effective use of gray water (on-site water recycling), and revise other building code requirements that might prevent the use of such systems.												
WC	Water Conservation												
WC1	Adopt a Water Conservation Strategy.	Direct	High	\$	Potential	Moderate	Possible		2020	Low	High	No	AD, RC
wc1.1	Reduce per capita water consumption by X% by 2020.												
wc1.2	Ensure that building standards and permit approval processes promote and support water conservation.												
wc1.3	Adopt a retrofit program to encourage installation of water conservation measures in existing businesses.												
wc1.4	Adopt a policy that would exceed the Water Efficient Landscape Ordinance which became State law on January 1, 2010.												
SOLID WASTE													
SW	Waste Reduction and Recycling												
SW1	Increase the diversion of solid waste from landfill disposal.	Indirect	High	\$	Potential	Moderate	Possible	✓	2020	Low	High	No	RC
SW2	Adopt a Construction and Demolition Recycling Ordinance.	Direct	High	\$	Potential	Moderate	Difficult		2020	Low	High	No	RC
SW3	Develop policy to reduce the generation of solid waste.	Direct	High	\$	Potential	Moderate	Difficult	✓	2020	Low	High	No	RC

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		Port Authority	Cost Effectiveness	Cost	Potential Funding	Implementability	Measurable Results	Key Measure	Timeframe	Reduction Potential	Technical Feasibility	Existing Contractual Agreement, State or Federal Law	Co-benefits
MISCELLANEOUS													
ME	Smart Grid												
M9	Develop Smart Grid and energy districts for Port operations and tenants	Indirect	Moderate	\$\$\$	Unknown	Low	Possible		2050	High	Moderate	No	EN
MC	Carbon Capture and Sequestration												
MC1	Carbon Sequestration. Develop program to conserve open space to preserve and promote the ability of such resources to remove carbon from the atmosphere. Identify and prioritize specific projects within the Port's jurisdiction that sequester carbon and provide other amenities, including wildlife habitat. Report on sequestered carbon	Indirect	Moderate	\$\$	Potential	Moderate	Possible		2020	Low	High	Yes	AQ, NH, LU
MC2	Active carbon capture and injection.	Indirect	Low	\$\$\$	Unknown	Low	Possible		2050	High	Low	No	EN, EB
MP	Programs and Outreach												
MP1	Increase public awareness of climate change and climate protection challenges, and support community reductions of GHG emissions through coordinated, creative public education and outreach, and recognition of achievements.	Indirect	na	\$	Potential	High	Difficult		2020	Supporting	High	No	
MP2	Develop a Green Business Certification Program.	Indirect	Moderate	\$	Current	High	Difficult		2020	Low	High	Yes	RC, EB
MP3	Ensure that Port Climate Mitigation and Adaptation Plan and Port Master Plan are aligned with, support, and enhance any regional plans that have been developed consistent with state guidance to achieve reductions in GHG emissions.	Direct	na	\$	Potential	High	Difficult		2020	Supporting	High	No	RP
MP4	Require Port and encourage Port tenants to purchase goods and services that embody or create fewer GHG emissions.	Direct	Moderate	\$	Potential	Low	Difficult		2020	Low	Low	No	EB, RC
MP5	Pursue off-site GHG mitigation strategies	Indirect	Low	\$\$\$	Unknown	Low	Possible		2020	Moderate	Moderate	No	Unknown
MP6	Develop a Green Lease standard.	Direct	Moderate	\$\$	Potential	High	Possible		2020	Moderate	High	No	RC
MP7*	Require through lease conditions, mitigation measures, and other mechanisms building and operational energy and water audits and a plan to implement cost-effective recommendations on a schedule consistent with the size of the tenant and the length of the lease.	Direct	High	\$\$	Potential	Moderate	Possible		2020	High	High	No	EB, EN, RC
MP8*	Develop and implement requirements for industrial tenants to inventory greenhouse gas emissions from stationary and non-transportation industrial operations and schedule to reduce those emissions in accordance with CARB, state, and Port goals.	Indirect	Moderate	\$\$	Potential	Low	Yes		2020	Moderate	Moderate	No	AQ, EN
MP9*	Coordinate with industrial tenants to achieve early reductions of those greenhouse gas emissions that are regulated under California’s AB32 Cap and Trade program.	Indirect	Moderate	\$\$\$	Unknown	Low	Yes		2020	Moderate	Moderate	No	AQ, RC

Table C-3 to Appendix C**
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		Port Authority	Cost Effectiveness	Cost	Potential Funding	Implementability	Measurable Results	Key Measure	Timeframe	Reduction Potential	Technical Feasibility	Existing Contractual Agreement, State or Federal Law	Co-benefits
MP10*	Set project-level thresholds of significance, in tons of CO2/yr, for use in the California Environmental Quality Act (CEQA) review process.	Direct	Moderate	\$	Unknown	Low	Possible		2020	Moderate	Moderate	No	AQ
MP11*	The League of American Bicyclist’s Traffic Skills 101 Class: Subsidize this class for all those that might drive to the Port, for whatever reason. The cost should be paid for all that graduate from the class with a passing grade.	Direct	Low	\$	Unknown	Moderate	Difficult		2020	Low	High	No	TR

*Indicates a new measure added during the CAP review process and after the analysis and quantification of GHG reduction impacts was conducted.

**This table is for reference only to Appendix C. These measures will be updated and evaluated per Board of Port Commissioners Policy 750

Appendix D – Greenhouse Gas Reduction Targets

D.1 Introduction

As described in Appendix A, California Environmental Quality Act (CEQA) Guidelines for greenhouse gas (GHG) emissions reduction plans, such as the Port's Climate Action Plan, have been developed by the California Governor's Office of Planning and Research (OPR) and adopted by the California Natural Resources Agency. The guidelines (CEQA Guidelines section 15183.5) specify that a plan for the reduction of GHG emissions should include or address specific elements. An important element of such a plan is to establish a level or target, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable. The guidance does not explicitly state how to calculate or select what the level, or target, should be.

While the OPR is currently developing additional guidance for climate action planning,¹ OPR refers to their presentation provided during its June 20, 2011, Local Government Roundtable regarding climate action planning² and to other recent climate action planning guidance documents such as the Bay Area Air Quality Management District's (BAAQMD's) CEQA Air Quality Guidelines³ that address considerations for the determination of what is cumulatively considerable for climate action planning. Given available information from OPR and the BAAQMD guidance on climate action planning, a target that meets or exceeds the State's target for 2020 under AB 32 (the Global Warming Solutions Act of 2006) and sets a 2050 target compatible with Executive Order S-3-05 is presumed to not be cumulatively considerable.

This appendix documents the four potential options for setting a 2020 target for GHG reduction in support of the Port of San Diego's (the Port's) Climate Action Plan discussed during the development of the Plan. Below is also a description of the available information to help inform the selection of a 2050 reduction target. Finally, a description of the public process used in the selection of specific GHG reduction targets for the Climate Action Plan by the Board of Port Commissioners is provided.

D.2 Options for Setting 2020 Targets

CEQA Guidelines for GHG emissions reduction plans, such as the Port's Climate Action Plan, suggest setting GHG emissions reduction target is an integral part of the development of a Climate Action Plan. The discussion of setting reduction targets for 2020 was informed by the Port's baseline and future GHG inventory (Appendix B) and the reduction measures (Appendix C and E) available to the Port during the development of the Climate Action Plan at the time

¹ OPR. 2011. CEQA and Climate Change http://www.opr.ca.gov/s_ceqaandclimatechange.php Accessed July 2012

² OPR. 2011. Climate Action Planning. Local Government Roundtable. June 20. <http://opr.ca.gov/docs/capppt.pdf> Accessed February 28, 2012.

³ BAAQMD. 2011. CEQA Air Quality Guidelines. May. <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx?la=en> Accessed February 28, 2012,

these analyses were conducted. This section only presents frameworks for setting the target that was used by the Port in the public process to select specific GHG reduction targets. Four different approaches for setting a 2020 target for the Climate Action Plan were analyzed and presented to inform discussion with the Port's Climate and Energy Work Group (the Work Group), a sub-group of the Board of Port Commissioners Environmental Advisory Committee in 2011 and 2012. These four approaches are discussed in more detail below and summarized in Table D-1

Table D-1. Goal Setting Approaches	
Approach	Corresponding 2020 Target
State's 2020 Goal	9.5% below 2006
Top-Down Approach	10.3% below 2006
Bottom-Up Approach ⁴	8.3% below 2006
Based on Relevant Examples	Varies (see Table D-3)

Based on these approaches, the Work Group centered their discussions on several scenarios (see Appendix E). For 2020, the Work Group selected potential GHG reduction targets representing the bottom-up approach, a simplification of the State's goal and the top-down approach, and an aspirational target beyond AB 32 (12%) for evaluation. The Work Group also selected a potential target of 25% for 2035 for discussion.

D.2.1 California's 2020 Goal

The goal the state has set for its statewide GHG emissions under AB32 is to reduce them to 1990 levels by 2020.^{5,6} However, a 1990 inventory was not developed for the Port as 1990 activity data gaps and needed assumptions would have made such an inventory highly speculative and an unreliable data set for the Climate Action Plan's decision-making process. Instead, members of the Work Group recommended that a more recent year inventory (2006) was to be developed for the Climate Action Plan (see discussion in Appendix B). The selection of a more recent year is compatible with guidance provided by OPR⁷ and with other recent

⁴ At the time of the reduction measure analysis presented during Work Group Meetings, a draft 7.5% target was determined for the bottom-up approach. Since then, the bottom-up target has been updated to 8.3% due to calculation revisions when finalizing this Climate Action Plan. This slight change does not warrant a revised analysis under this appendix as the Board of Port Commissioners voted to support a 10% target to be consistent with State goals.

⁵ ARB. 2005. Executive Order S-3-05. June 1. <http://gov38.ca.gov/index.php?/print-version/executive-order/1861/>. Accessed June 20, 2012.

⁶ ARB. 2006. Assembly Bill 32: Global Warming Solutions Act. <http://www.arb.ca.gov/cc/ab32/ab32.htm>. Accessed June 20, 2012.

⁷ OPR. 2011. Climate Action Planning. Local Government Roundtable Questions and Answers. June 20. <http://opr.ca.gov/docs/capfaq.pdf>. Accessed February 28, 2012.

climate action planning guidance documents such as the BAAQMD's CEQA Air Quality Guidelines.⁸

Given the Climate Action Plan's 2006 baseline year, the overall California statewide inventory available in 2011 (at the time of this analysis) was used to calculate the percentage of emission reductions required to take statewide 2006 emissions⁹ back to 1990 levels.¹⁰ In 2006, California statewide emissions were equal to 471.3 million metric tons of carbon dioxide equivalents (MMT CO₂e). The 1990 emission level in California was estimated to be 426.6 MMT CO₂e. Thus, a reduction from 2006 to 1990 emission levels represents an approximate **9.5% reduction** from 2006 statewide emissions.¹¹

D.2.2 "Top-Down Approach"

During the evaluation of the statewide inventories in Section D.2.1, it was noted that the Port's projected growth rate in its emission inventory is greater than the projected California growth rate of the statewide inventory by about 8%. An argument could be made that the estimated 2020 statewide reduction target of approximately 9.5% from 2006 levels could reasonably be adjusted proportionally with the Port's growth rate for application to the Port's GHG inventory. This assumption results in a scaled value of a **10.3% reduction**, which would account for the additional reductions that would be needed due to the Port's greater assumed inventory growth rate.¹² This option was called the "Top-Down Approach" during the Port's public discussion over potential targets.

D.2.3 "Bottom-Up Approach"

In a "bottom-up approach", the expected emission reductions on a sector-by-sector basis by using the California Air Resources Board's (ARB) Scoping Plan¹³ (which is the plan developed to implement AB 32) was used in conjunction with the most recent projection for 2020 emissions in the State of California.¹⁴ The Scoping Plan presents expected emission reductions by sector from individual reduction measures. Estimates for reductions from these measures were

⁸ BAAQMD. 2011. CEQA Air Quality Guidelines. May.
<http://www.baaqmd.gov/-/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx?la=en> Accessed February 28, 2012

⁹ ARB. California Greenhouse Gas Inventory Data, 2000 to 2008. <http://www.arb.ca.gov/cc/inventory/data/data.htm>. Accessed August 23, 2011.

¹⁰ ARB. California Greenhouse Gas Inventory for 1990.
http://www.arb.ca.gov/cc/inventory/pubs/reports/appendix_a1_inventory_ipcc_sum_1990.pdf. Accessed August 23, 2011.

¹¹ When this reduction is applied to the Port's baseline 2006 inventory, this represents a 12.6% reduction from the Port's 2020 projected inventory accounting for current regulations.

¹² When adjusted for the Port's growth rate, this represents a 13.4% reduction from the Port's 2020 projected inventory accounting for current regulations.

¹³ ARB. 2008. Climate Change Scoping Plan: a Framework for Change. December.

¹⁴ ARB. 2010. Greenhouse Gas Inventory – 2020 Emissions Forecast. Available at:
<http://www.arb.ca.gov/cc/inventory/data/forecast.htm> Accessed August 23, 2011.

revised in ARB's *Status of Scoping Plan Recommended Measures*.¹⁵ Evaluation on the sector-level basis can provide valuable information as the Port, unlike cities or counties, does not have certain economic sectors (e.g., agriculture and residential) where ARB is expecting to achieve GHG emission reductions on a statewide basis.

The Port's consulting team of ENVIRON, MIG, and Chambers Group (the "ENVIRON Team"), prepared an approximate analysis estimating percent emission reductions by economic sector from both Scoping Plan measures and also by additional emission reductions expected from cap-and-trade.¹⁶ These percent emission factor reductions were applied to the sectors in the Port's GHG inventory to estimate emission reductions, as presented in Table D-2. As can be seen in the table, the Port's future 2020 emissions incorporating emission reductions from Scoping Plan measures and Cap-and-Trade is 757,478 metric tons CO₂e. This represents a **8.3% reduction**¹⁷ from the Port's 2006 Baseline emissions level based on information available at the time of this assessment.^{18,19}

Table D-2. Summary of GHG Emissions for the Port of San Diego by Sector					
Category	Baseline (2006)	Future (2020 BAU)	Growth Reduction Adjustment ^a	CA Projected Reduction	Future (2020) with CA Reductions & Growth Adjustment
	metric tons CO ₂ e		%	%	metric tons CO ₂ e
Electricity	173,192	208,231	8%	22%	148,870
Natural Gas	135,516	152,803		18%	115,047
Transportation: Onroad	314,870	410,069		27%	275,918
Transportation: Offroad Vehicles, Vessels, Equipment, Locomotives	172,929	233,528		11%	191,714
Water Use	13,166	14,630		22%	10,459
Waste	16,757	20,439		18%	15,469

¹⁵ ARB. 2011. Status of Scoping Plan Recommended Measures. Available at: http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf. Accessed August 23, 2011.

¹⁶ In this analysis, ENVIRON assumed that emission reductions from cap-and-trade were allocated to each capped economic sector based on additional required emission reductions after accounting for expected reductions from Scoping Plan measures. While emission reductions from cap-and-trade reductions may not occur in this fashion, this first-order approximation is reasonable for purposes of this analysis.

¹⁷ At the time of the reduction measure analysis presented during Work Group Meetings, a draft 7.5% target was determined for the bottom-up approach. Since then, the bottom-up target has been updated to 8.3% due to calculation revisions when finalizing this Draft Climate Action Plan. This slight change does not warrant a revised analysis under this appendix as the Board of Port Commissioners voted to support a 10% target to be consistent with State goals.

¹⁸ The GHG emissions sources within the Port are not inclusive of all sources with expected emissions reductions in the Scoping Plan. This explains the difference between the bottom-up target (8.3%) and the top-down target (10.3%).

¹⁹ This also represents a 11.5% reduction from the Port's 2020 projected inventory accounting for current regulations.

Table D-2. Summary of GHG Emissions for the Port of San Diego by Sector					
Category	Baseline (2006)	Future (2020 BAU)	Growth Reduction Adjustment ^a	CA Projected Reduction	Future (2020) with CA Reductions & Growth Adjustment
	metric tons CO ₂ e		%	%	metric tons CO ₂ e
Total	826,429	1,039,700		-	757,478

Notes:

- The Growth Reduction Adjustment factor accounts for the difference in the Port's projected growth rate compared to the California statewide projected growth rate through 2020 (the Port's growth rate is approximately 8% greater than the CA growth rate) . This allows the California projected reductions to be applied on a normalized scale.
- Diesel combustion is included under the "Transportation: Off-road Vehicles, Vessels, Equipment, Locomotives" category. This differs from Appendix B, where diesel combustion is included under 'Energy'.

D.2.4 Selection of Target Based on Relevant Examples

Another option for evaluating targets was to review examples of targets set for other local jurisdictions' Climate Action Plans or sustainability targets. It should be noted that the examples provided in Table D-3 below represent targets set by cities and counties, which have a different sector mix of GHG emissions than found in the Port's inventory, and may also have differing calculation methodologies and priorities. This difference in the sector mix of GHG emissions and the resulting impact on estimated emission reduction needs to meet state targets was evaluated in the options described in Section D.2.3. It is important to note that the sustainability targets for the Port of Portland and the Port Authority of New York and New Jersey may not have been established using a similar Climate Action Plan approach developed under a CEQA or AB 32 context.

Table D-3. Climate Action Plan Goals for Other Local Jurisdictions and a Selection of North American Ports				
Jurisdiction	2020 Reduction Target		Notes	Date Published
	%	From Year		
Statewide (AB32)	0	1990	80% below 1990 by 2050	Jun-05
	10	2006		
City of San Diego	15	2008	48% below 2008 in 2035, and 80% below 1990 in 2050	Feb-12 (draft)
County of San Diego	15	2005	Will revisit 2035 target in future	Apr -12 (draft)
Port of Los Angeles	0	1990	35% below 1990 by 2030, and 80% below 1990 by 2050	Feb-12
County of San Luis Obispo	15	2006		Aug-11

Table D-3. Climate Action Plan Goals for Other Local Jurisdictions and a Selection of North American Ports				
Jurisdiction	2020 Reduction Target		Notes	Date Published
	%	From Year		
National City	15	2005 /2006	Additional reductions by the year 2030	Jan-11
City of Encinitas	12	2005		Mar-11
Union City	20	2005		Nov-10
City of Oakland	36	2005		Mar-11
City of Albany ¹	25	2004		Apr-10
City of Santa Cruz	30	1990	80% below 1990 by 2050	Dec-11
City of Chula Vista ¹	20	1990		Nov-00
Port of Portland	15	1990		2011
Port Authority of New York and New Jersey	-	-	80% from 2006 levels by 2050 (operations, tenants, and customers) Net-zero from own operations by 2010.	2008
City of Los Angeles ¹	-	-	35% below 1990 by 2030	May-07
City of Hesperia ¹	-	-	Per capita emissions 29% below BAU by 2020	Jul-10

Notes:

1. Developed prior to 2010 revision of statewide inventories by ARB.

D.3 Setting 2050 Targets

Approaches to evaluate reduction targets for 2050 are more limited than for 2020. Currently, the State's goal for 2050 is set under Executive Order S-3-05 at a statewide 80%²⁰ reduction of 1990 levels of GHG emissions. This goal for 2050 is not further evaluated in a regulatory context since AB32 only sets forth the State's 2020 reduction goal into law.²¹

Examples of post-2020 targets set for other local jurisdictions' Climate Action Plans or sustainability targets were also evaluated during discussions with the Work Group. Based on

²⁰ ARB. 2005. Executive Order S-3-05. June 1. <http://gov38.ca.gov/index.php?/print-version/executive-order/1861/>. Accessed June 20, 2012.

²¹ ARB. 2006. Assembly Bill 32: Global Warming Solutions Act. <http://www.arb.ca.gov/cc/ab32/ab32.htm>. Accessed June 20, 2012.

the Climate Action Plans and materials reviewed, only the City of San Diego, City of Santa Cruz, and Port of Los Angeles set goals for 2050, all at 80% below 1990, aligning with the State's goal for that year. The City of San Diego also sets a goal for 37% below 2008 in 2035, the Port of Los Angeles set a goal on 25% below 1990 in 2030, the City of Los Angeles set a goal for 35% below 1990 levels by 2030 and National City specified additional reductions by 2030 but did not set a numerical goal

D.4 Process for Setting GHG Emission Reduction Targets

In 2012, the Port used a public process to discuss, propose and then select the Climate Action Plan's emission reduction targets. Potential Port targets for 2020 and 2050 were discussed in the Work Group based on information available at the time: the Port's emissions inventories (Appendix B), approaches summarized in Table D-1, and available reduction measure and projected reductions in GHGs from their implementation (Appendix E),. The Work Group then referred the potential options to the Port's Environmental Advisory Committee (EAC).

The EAC discussed GHG emissions reduction targets as an agenda item at the February and March 2012 meetings. The recommendation passed in March by majority vote is as follows:

- 10% GHG emission reduction by 2020
- 12% GHG emission reduction by 2025
- 25% GHG emission reduction by 2035
- No recommendation for 2050

At its June 2012 meeting, the Board of Port Commissioners (the Board) discussed and recommended the following reduction targets for the Port's Climate Action Plan:

- 10% GHG emission reduction by 2020 (corresponding with the top down approach presented in Section D.2.2)
- 25% GHG emission reduction by 2035 (to revisit in future updates)
- Acknowledge statewide 2050 targets in plan, revisit in future updates

The Board's selection is reflected in this Draft Climate Action Plan for further review by the Board of Port Commissioners and the public.

D.5 References

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Appendix E – Quantifying Greenhouse Gas Reduction Measures to Achieve Reduction Targets

E.1 Introduction

An important step in developing the San Diego Unified Port District's (the Port's) Climate Action Plan is the quantification and specification of reduction measures to achieve the Port's greenhouse gas (GHG) emission reduction targets, described in Appendix D. This process of evaluating reduction measures in the context of the Climate Action Plan's reduction targets is responsive and consistent with the fourth California Environmental Quality Act (CEQA) Guideline element for climate action planning under §15183.5, as discussed in Appendix A (the Climate Action Plan's relationship to CEQA). This Appendix documents the quantification of reductions from potential GHG reduction measures, evaluation of reduction scenarios to achieve various targets, and identification of reduction measure objectives and performance requirements necessary to meet the GHG reduction targets used during the development of the Climate Action Plan in 2011 and 2012. See Appendix C for a list of reduction measures used in this analysis.

This reduction measure evaluation described below only applies to reduction measures that would be implemented by the Port and does not include GHG reductions associated with California statewide reduction measures. Statewide measures are evaluated and incorporated in the Port's projected inventories for 2020, 2035, and 2050 and are described in detail in Appendix B.

It is important to note that monitoring the progress of the Climate Action Plan may provide additional information that results in changes to the assumptions made in this appendix. Future updates to the list of reduction measures and their categorization, assessment, and prioritization will be done in accordance with the methods in Board of Port Commissioners Policy 750, as described in Appendix C. The remainder of this Appendix describes the process used during the development of the Climate Action Plan.

E.2 Reduction Measure Evaluation Approach

Reduction measures were evaluated based on their potential to reduce GHG emissions. The projected reductions from the Port's measures have been evaluated on a measure-by-measure basis, or in some cases as groups of measures. Reductions to the Port's GHG inventory from reduction measures are determined based on an estimated or assumed reduction potential for each measure or group of measures and the extent of the implementation (e.g., participation rates). This section discusses the approach and methodology used to quantify the reduction potential of the Port's reduction measures.

In cases where a detailed site-specific GHG reduction analysis has been performed such as in the Port's San Diego Gas and Electric (SDG&E) Energy Roadmap¹, the refined analysis has been used as the basis for projected GHG reductions. For all other reduction measures, GHG reduction projections are quantified based on the approach discussed below that includes identification of reduction potential, quantification of the applicable GHG inventory sector quantity and reduction metrics, and assessment of measure penetration/participation. Unless otherwise specified by methodologies identified in guidance from the California Air Pollution Control Officers Association (CAPCOA)² the basic math to estimate reduction potential is as follows:

$$\text{GHG Reduction} = \text{Sector/Category Quantity} \times \text{Penetration/Participation} \times \text{Reduction Potential} \times \text{GHG Emission Factors}$$

Where:

Sector/Category Quantity:	The total Port Inventory metric amount (e.g., kW-hr, therms, metric tons of CO ₂ e, etc.) for the sector/category related to the reduction measure or group of reduction measures (e.g., energy, natural gas)
Penetration/Participation:	Expressed as a percentage (see below)
Reduction Potential:	Expressed as a percentage (see below)
Emission Factors:	GHG emission factors as identified in Appendix B for the applicable sector/category
GHG reduction:	Metric tons of carbon dioxide equivalent (MT CO ₂ e)

The sections below provide additional detail on the general approach described above.

E.2.1 Reduction Potential

Each reduction measure or group of measures is designed to target GHG emissions from a specific sector and/or category of the Port's GHG inventory. Each inventory sector and category represents a different type of emissions source or activity such as building operations, on-road or off-road vehicle use, water use, waste disposal, etc. Typically there is an inherent limit to the percentage of the GHG emissions from each sector/category that a measure or group of measures can prevent or capture if fully implemented. The upper limit of a measure(s) reduction potential may be fixed by

¹ San Diego Unified Port District. 2009. San Diego Unified Port District Energy Roadmap. February, 19. Available at: <http://www.portofsandiego.org/environment/green-port/1504-port-of-san-diego-moves-forward-with-sustainable-energy-partnership.html>. Accessed July 23, 2012.

² CAPCOA. 2010. Quantifying Greenhouse Gas Reduction Measures; A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Reduction Measures. August.

technological limitations or be flexible and directly correlated with the aggressiveness of the measure's implementation. For flexible reduction potentials, the more aggressive the desired reduction potential, the more difficult it becomes to achieve (i.e., more costly or effort-intensive). The base case or typical reduction potential of each of the Port's identified reduction measures has been estimated consistent with methodologies and assumptions for similar reduction measures addressed by guidance from CAPCOA³, other recent California Climate Action Plans, and publically available literature. In addition, considerations specific to the Port's operations have been incorporated to more accurately quantify potential measure reductions (e.g., mix of Port land uses and consideration of Port authority).

When the reduction potential of measures is defined as the total potential percent reduction of a sector category of the overall GHG inventory, it is necessary to quantify the applicable inventory sector/category being targeted and determine the extent of the measure's implementation.

E.2.2 Reduction Measure Sector Quantity and Reduction Metric

The quantity of GHG emissions associated with a given inventory sector/category, or sector quantity, that a reduction measure or group of measures can potentially target and reduce may be quantified based on a reduction metric or as the total MT CO₂e comprised by the sector. A reduction metric is a measure of the activity associated with an inventory sector and is directly proportional to the GHG emissions resulting from the activity. A reduction metric is useful as it relates directly to a quantity that can be readily estimated or measured. A list of reduction metrics and examples of the types of reduction measures they apply to is provided in Table E-1 below.

Table E-1. Reduction Metrics	
Reduction Metric	Description and Applicability
Kilowatt-hours (kWh)	A kWh is a measure of electricity and is directly related to GHG emissions resulting from electricity consumption. Applicable reduction measures include building energy use, alternative energy generation, heat gain and shading, and lighting related measures.
Therms	A therm is a measure of natural gas and is directly proportional to GHG emissions from natural gas combustion. Applicable reduction measures include building energy use, alternative energy generation, and heat gain and shading related measures.
Vehicle miles traveled (VMT)	Vehicle miles traveled is a measure of motor vehicle operation and is used to quantify GHG emissions from

³ CAPCOA. 2010.

Table E-1. Reduction Metrics	
Reduction Metric	Description and Applicability
	consumption of fuel. Applicable reduction measures include land use/community design, transit system improvement, parking policy/pricing, and trip and vehicle mile reduction related measures.
Solid waste disposal, in tons	The quantity of solid waste disposed at a landfill is related to GHG emissions resulting from landfill gas generation. Applicable reduction measures include waste reduction and recycling measures.
Water usage, in millions of gallons	The quantity of water used is related to GHG emissions resulting from water distribution and treatment. Applicable reduction measures include water recycling and conservation measures.
Number of trees planted	The number of trees planted relates to the sequestration, or uptake, of GHGs. Applicable reduction measures include carbon sequestration related measures involving trees.

As discussed above, a sector quantity may also be quantified as MT CO₂e. This approach is used in cases where a reduction metric (e.g., kWh) applicable to the target sector is not readily quantifiable from the GHG inventory. Examples of reduction measures where this approach is used include transportation reduction measures where the sector quantity is not directly related to VMT and instead relates to vehicle idling or vehicle engine efficiency. For these types of transportation reduction measures, the Port's GHG inventory does not explicitly break out the relevant GHG emissions for the sector, and thus it is more convenient to use MT CO₂e when evaluating reduction potentials

Not all reduction measures or groups of measures will be implemented to the same extent for future projects and activities as they will be for existing development/infrastructure and ongoing activities. Thus, where differences in implementation exist, reduction measures are quantified separately for each segment⁴ of the Port's GHG inventory. For example, some reduction measures targeting future projects subject to environmental review are expected to be mandatory and will thus have higher implementation rates than the same measures which may be voluntary for existing infrastructure and ongoing activities. See Appendix B for a discussion of future projects' emissions assumptions. Thus, reduction measures have been classified as being applicable to existing buildings, future projects, or both. A full listing of reduction

⁴ By "inventory segment" we are referring to the segment of the inventory associated with future projects or segment of the inventory associated with existing projects.

measures and designation for applicability to existing development, future development, or both is summarized in Table F-1 of Appendix F.

E.2.3 Reduction Measure Penetration/Participation

The extent of a measure's implementation represents the degree or rate at which a measure penetrates the intended GHG inventory sector that is being targeted or the level at which the Port community participates and complies with the reduction measures. The penetration/participation rate relates to how effective a reduction measure is anticipated to be at achieving the reduction potential. This rate is a function of a number of different factors including the reduction measure's relative ease, cost, and feasibility of implementation, as well as the Port Tenants' and public's awareness and participation. As discussed above, the reduction potential represents a fixed or sometimes flexible upper limit, of the possible GHG reduction a reduction measure or group of measures can achieve if fully implemented. For each reduction measure or group of measures, a penetration/participation rate has been assumed or calculated based on the measure's applicability (i.e., future projects, existing development, or both).

For reduction measures envisioned to be a requirement for future projects, the penetration/participation rate is assumed to be 100 percent. This assumes that the Port has the authority to require compliance with the elements of the reduction measures through the environmental review process.

For non-compulsory reduction measures, baseline or typical penetration/participation rates have been assumed consistent with methodologies and assumptions for similar reduction measures addressed by Guidance from CAPCOA⁵, other recent California climate action plans, and publically available literature.

E.2.4 Reduction Measure Quantification

Based on the reduction potential, sector quantity, and penetration/participation rate of each reduction measure or group of measures, a projected reduction in terms of the corresponding reduction metric (e.g., kWh, therms, VMT, etc.) was calculated. The resulting reduction per reduction metric was then converted into MT CO₂e to allow for direct evaluation of the GHG emissions reductions from reduction measure implementation. The calculation of MT CO₂e was performed consistent with the methods described in Appendix B - GHG inventory documentation.

As many reduction measures target the same sectors of the Port's inventory and may be implemented simultaneously, some reductions may become overestimated. That is, multiple measures may target and capture the same activities or sector quantity reductions such as energy efficiency and alternative energy generation reduction

⁵ CAPCOA. 2010. Quantifying Greenhouse Gas Mitigation Measures; A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures. August.

measures. Both of these sets of measures target GHG emissions from energy consumption. GHG emissions reduced by one reduction strategy will not be available for reduction by the other. Where possible, adjustments were made to prevent double-counting of GHG reductions where overlapping reduction measures will exist. One approach used to reduce the double-counting of GHG reductions is to assess groups of similar measures as a whole rather than independently. As with the measure reduction potential assumptions, considerations specific to the Port's operations have been incorporated to more accurately quantify measure reductions (e.g., mix of Port land uses and consideration of Port authority).

E.3 Specification of Reduction Measure Objective to Achieve 2020 Targets

To evaluate the necessary reduction measure performance objectives to meet future GHG reduction targets, potential reduction scenarios have been evaluated. Using the reduction measure evaluation approach outlined above, potential GHG reductions resulting from increasingly aggressive levels of implementation were considered per request from the Port's Climate and Energy Work Group (the Work Group).

E.3.1 Approach

As a starting point, a base case reduction scenario for year 2020 was developed. This scenario is intended to be representative of anticipated GHG emissions reductions corresponding to a typical level of implementation. The base case reduction scenario was developed based on typical reduction potentials and penetration/participation rates for reduction measures consistent with similar reduction measures addressed by guidance from CAPCOA, other recent California climate action plans, and publically available literature as discussed above. As the implementation of reduction measures is anticipated to be a requirement of all future Port projects subject to environmental review, the penetration/participation rate for the future project segment of the inventory is assumed to be 100 percent. The total GHG reductions from the base case scenario represent the overall potential reductions from all the Port's reduction measures under a typical level of implementation. For the base case 2020 Scenario, the attached Table E-2, outlines the reduction assumptions (i.e., reduction potential and penetration/participation rate), the sectors quantities, and the estimated GHG reductions for each of the Port's identified reduction measures.

It is important to note that the GHG reductions estimated based on this approach quantify only the reductions associated with the Port's reduction measures. GHG reductions associated with California regulations are already accounted for in the Port's future inventory projections (e.g., the Renewables Portfolio Standard, Pavley vehicle standards, ocean going vessels fuel switch regulation, etc.). Government regulations are estimated to result in a reduction in 2020 emissions levels of approximately 18%. Details regarding projected reductions in the Port's future inventories from Government regulations are provided in Appendix B.

To evaluate the overall potential reduction under increasingly aggressive reduction scenarios, the analysis focused on reductions from measures with the greatest potential for reducing GHG emissions. The key measures with the greatest reduction potential are measures that target the largest sector quantities of the Port's inventory and/or have high reduction potentials or penetration/participation rates. In addition, as the measures must be feasibly implemented in the near term in order to be a key contributor to meeting the Port's 2020 target, priority was also placed on measures considered quick wins or those that require minimal planning.

The key reduction measures are identified for addressing GHG reductions associated with either future projects only, or for both existing and future infrastructure and activities (referred to as Existing Operations and Future Projects) as shown in the table below. The reduction measure identifications (IDs) referenced under each measure category corresponds to specific reduction measures discussed in detail in Appendix C.

Table E-3. Key Reduction Measures	
Measure Category	Measure IDs included in Category
Future Project	
Parking Policy/Pricing	TP1, TP2
Trip and Vehicle Miles Reduction	TL1, TL2, TL3 ⁶ , TV1
Energy Efficiency	EB1, EB3, EH1
Waste Reduction and Recycling	SW1, SW3
Lighting	EL1, EL4, EL5 ⁷
Existing Operations and Future Projects	
Energy Efficiency	EB2, EB3, EB4, EB5
Alternative Energy Generation	EA1, EA4, EA6, EA9
Transit System Improvements	TT1, TT2, TT3
Parking Policy/Pricing	TP1, TP2
Trip and Vehicle Miles Reduction	TV1
Roadway System Management (All)	TR1, TR2
Roadway System Management (Maritime)	TR2, TR3, TR4
Alternative Powered Vehicles (Non-Maritime)	TA1, TA2

⁶ Measure TL1 was deleted during final Climate Action Plan review; measures TL2 and TL3 have been renamed TL 1 and TL2, respectively. See Climate Action Plan for final measures.

⁷ Measure EL5 was renamed EB6 during final Climate Action Plan review. See Climate Action Plan for final measures.

For the 2020 base case scenario, the GHG reductions from the key measures listed in Table E-3 contribute to over 80% of the total estimated GHG reductions to the Port's inventory. Within the key measure reductions, approximately 72% come from reduction measures targeting the existing operations and future Port projects and 28% are from reduction measures applicable only to future projects. These key reduction measures represent the primary tools available to the Port for achieving the greater GHG reductions than evaluated in the base case.

The reduction potential and penetration/participation rate of each of the reduction measures or groups of measures represent the measure performance objectives that the Port can set to achieve greater overall reductions. More aggressive reduction scenarios or targets require that objectives be ratcheted up to increase performance. There are different combinations of measures and performance levels that can achieve the same targets. The reduction potential, or amount by which the measure can reduce GHG emissions, is limited by technical feasibility for many measures. For example, energy efficiency reduction measures for buildings, such as energy efficient appliances or lighting, can only reduce appliance and lighting GHG emissions so far and cannot eliminate them entirely. The exact reduction depends on the difference in energy rating between the inefficient and efficient units. For measures limited by technical feasibility, the penetration/participation objective is the only means of achieving greater reductions. In terms of actual implementation, the level to which each objective is set represents the degree of effort, participation, and compliance with reduction measures that will be required from the Port and the Port's tenants and community to achieve the corresponding GHG reduction.

During its deliberations on potential GHG reduction targets (based on approaches described in Appendix D), the Work Group requested analysis of reduction measure performance objectives that would meet various GHG reduction targets discussed in Appendix D, as shown in Table E-4.

Table E-4. Goal Setting Approaches		
Scenario # (%reduction below 2006 in 2020)	Approach for Goal Setting from Appendix Table D-1	Corresponding 2020 Target from Appendix Table D-1
1: 7.5%	Bottom-Up Approach ⁸	8.3% below 2006
2: 10%	Top-Down Approach	10.3% below 2006
3: 12%	Aspirational Target from	Not Applicable

⁸ At the time of the measure analysis presented during Work Group Meetings, a draft 7.5% target was determined for the bottom-up approach. Since then, the bottom-up target has been updated to 8.3% due to calculation revisions when finalizing this Draft Climate Action Plan. This slight change does not warrant a revised analysis under this appendix as the Board of Port Commissioners voted to support a 10% target to be consistent with State goals.

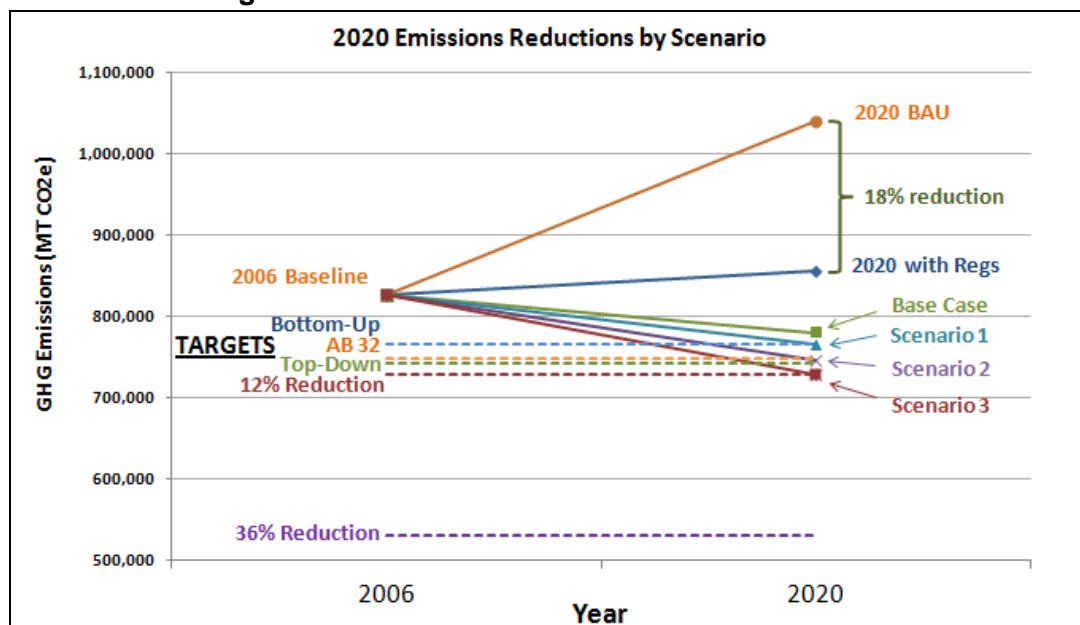
	Work Group	
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The Work Group also selected one scenario for targets past 2020:

- “Scenario 4” – 25% below 2006 in 2035

The emissions reductions scenarios displayed in Figure E-1 below show their impact on the Port’s 2020 GHG inventory relative to the 2006 baseline inventory and projected 2020 inventory. For comparison and context, this figure also depicts the various GHG reduction targets evaluated by the Port. A detailed discussion of these targets is presented in Appendix D.

Figure E-1. 2020 Emissions Reduction Scenarios



For each reduction scenario, combinations of key measures were evaluated to specify what level of implementation would be required. For each scenario, the objectives for each measure were increased based how feasible or achievable the increase is in practice (e.g., reductions from the lower hanging fruit were captured first). This was done in order to balance how aggressive each measure would need to be under each scenario. As discussed above for the future project only segment, reduction measures are assumed to be mandatory and their reduction percentage is limited by technical feasibility, thus the reduction assumptions and corresponding reductions in the base case scenario are representative of all future reduction scenarios.

The results for each GHG reduction scenario in order of increasing aggressiveness (i.e., 2020 base case to Scenario 3) are presented below. The color coding on each of the

scenario summary tables highlight the penetration/participation rate and reduction potential increases required in order to achieve each successive performance objective.

E.3.2 Base Case for 2020

Under the 2020 base case scenario it is projected that the Port's approximate GHG emissions would be **5.7% below** the 2006 baseline inventory.

The assumed reduction potential and penetration/participation rates for the base case scenario and the corresponding GHG reductions associated with each measure category for the future project and the existing operations inventory segments of the Port's GHG inventory are provided in Tables E-5 and E-6 below. As discussed above, reduction measures are classified as being applicable to existing development, future projects, or both inventory segments.

As described above, baseline or typical penetration/participation rates have been assumed consistent with methodologies and assumptions for similar reduction measures addressed by guidance from CAPCOA⁹, other recent California Climate Action Plans, and publically available literature are assumed for this case.

Table E-5. Future Project GHG Reductions (All 2020 Scenarios)				
Measure Category	-- Objectives --			GHG Reduction [MT CO₂e]
	Penetration/ Participation	Reduction	Metric Reduced	
Parking Policy/Pricing	100%	10%	VMT	5,031
Trip and Vehicle Miles Reduction	100%	10%	VMT	5,031
Energy Efficiency	100%	20%	kW-hr/ therms	3,268
Waste Reduction and Recycling	100%	35%	tons solid waste	1,807
Lighting	100%	25%	kw-hr	1,612

⁹ CAPCOA. 2010.

Table E-6. Existing Development Reductions (Base Case 2020)				
Measure Category	-- Objectives --			GHG Reduction [MT CO2e]
	Penetration/ Participation	Reduction	Metric Reduced	
Energy Efficiency	30%	25%	kW-hr	5,769
	30%	25%	therms	
Transit System Improvements	20%	10%	VMT	4,389
Parking Policy/Pricing	20%	10%	VMT	3,382
Trip and Vehicle Miles Reduction	20%	20%	VMT	6,765
Alternative Powered Vehicles (Non-Maritime)	15%	20%	MT CO2e	5,074
Alternative Energy Generation	100%	5%	kW-hr	6,942
Roadway System Management (All)	100%	2.5%	MT CO2e	7,862
Roadway System Management (Maritime)	100%	5%	MT CO2e	3,428

E.3.3 Scenario 1 for 2020

Scenario 1 represents GHG reduction to 7.5% below the 2006 baseline inventory for 2020.¹⁰ The assumed reduction potential and penetration/participation rates and the corresponding GHG reductions under Scenario 1 for the existing and future inventory segments of the Port's GHG inventory are provided in the Table E-7. Modifications from the Base Case Scenario are highlighted in orange.

¹⁰ At the time of the reduction measure analysis presented during Work Group Meetings, a draft 7.5% target was determined for the bottom-up approach. Since then, the bottom-up target has been updated to 8.3% due to calculation revisions when finalizing this Draft Climate Action Plan. This slight change does not warrant a revised analysis under this appendix as the Board of Port Commissioners voted to support a 10% target to be consistent with State goals.

Table E-7. Existing Development Reductions (Scenario 1)				
Measure Category	-- Objectives --			GHG Reduction [MT CO ₂ e]
	Penetration/ Participation	Reduction	Metric Reduced	
Energy Efficiency	50%	25%	kW-hr	9,615
	50%	25%	therms	
Transit System Improvements	25%	10%	VMT	5,486
Parking Policy/Pricing	20%	10%	VMT	3,382
Trip and Vehicle Miles Reduction	25%	20%	VMT	8,456
Alternative Powered Vehicles (Non-Maritime)	20%	20%	MT CO ₂ e	6,765
Alternative Energy Generation	100%	10%	kW-hr	13,645
Roadway System Management (All)	100%	2.5%	MT CO ₂ e	7,862
Roadway System Management (Maritime)	100%	5%	MT CO ₂ e	3,428

Note: Cells highlighted in orange represent modifications from the Base Case Scenario.

E.3.4 Scenario 2 for 2020

Scenario 2 for 2020 represents GHG reduction to **10% below** the 2006 baseline inventory. The assumed reduction potential and penetration/participation rates and corresponding GHG reductions under Scenario 2 for the existing and future inventory segments of the Port's GHG inventory are provided in Tables E-8. Modifications from the Base Case Scenario are highlighted in orange. Further modifications beyond Scenario 1 are highlighted in blue.

Table E-8. Existing Development Reductions (Scenario 2)				
Measure Category	-- Objectives --			GHG Reduction [MT CO2e]
	Penetration/ Participation	Reduction	Metric Reduced	
Energy Efficiency	75%	25%	kW-hr	14,422
	75%	25%	therms	
Transit System Improvements	25%	10%	VMT	5,486
Parking Policy/Pricing	25%	10%	VMT	4,228
Trip and Vehicle Miles Reduction	25%	20%	VMT	8,456
Alternative Powered Vehicles (Non-Maritime)	20%	20%	MT CO2e	6,765
Alternative Energy Generation	100%	13%	kW-hr	17,349
Roadway System Management (All)	100%	5.0%	MT CO2e	15,724
Roadway System Management (Maritime)	100%	7.5%	MT CO2e	5,143

Note: Cells highlighted in orange represent modifications from the Base Case Scenario. Cells highlighted in blue represent further modifications from Scenario 1.

E.3.5 Scenario 3 for 2020

Scenario 3 for 2020 represents reduction to **12% below** the 2006 baseline inventory. The assumed reduction potential and penetration/participation rates and corresponding GHG reductions under Scenario 3 for the existing and future inventory segments of the Port's GHG inventory are provided in the Table E-9. Modifications from the Base Case Scenario are highlighted in orange. Further modifications beyond Scenario 1 are highlighted in blue. Additional modifications beyond Scenario 2 are highlighted in purple.

Table E-9. Existing Development Reductions (Scenario 3)				
Measure Category	-- Objectives --			GHG Reduction [MT CO ₂ e]
	Penetration/ Participation	Reduction	Metric Reduced	
Energy Efficiency	95%	25%	kW-hr	18,268
	95%	25%	therms	
Transit System Improvements	25%	10%	VMT	5,486
Parking Policy/Pricing	25%	10%	VMT	4,228
Trip and Vehicle Miles Reduction	25%	20%	VMT	8,456
Alternative Powered Vehicles (Non-Maritime)	20%	20%	MT CO ₂ e	6,765
Alternative Energy Generation	100%	24%	kW-hr	31,455
Roadway System Management (All)	100%	5.0%	MT CO ₂ e	15,724
Roadway System Management (Maritime)	100%	7.5%	MT CO ₂ e	5,143

Note: Cells highlighted in orange represent modifications from the Base Case Scenario. Cells highlighted in blue represent further modifications from Scenario 1. Cells highlighted in purple represent further modifications from Scenario 2.

E.4 Specification of Reduction Measure Objectives Beyond 2020

As discussed above, reduction measure performance objectives to meet a reduction target of **25% below** the 2006 baseline inventory was also analyzed. This scenario, referred to as Scenario 4, was developed based on the Port's projected 2035 inventory which was prepared according to the assumptions and methodologies discussed in Appendix B.

In addition, the projected GHG reductions were also calculated for 2050 under the same set of reduction measure objectives as specified for 2035. Note that the methodology used to evaluate scenarios beyond 2020 is consistent with the 2020 approach discussed above in Section E.3.1.

The assumed reduction potential and penetration/participation rates required to achieve Scenario 4 in 2035 and the corresponding GHG reductions associated with each measure category for the future project and the existing and future inventory segments

of the Port's GHG inventory are provided in Tables E-9 and E-10 below. Modifications from the Base Case Scenario are highlighted in orange. Further modifications beyond Scenario 1 are highlighted in blue, beyond Scenario 2 in purple, and beyond Scenario 3 in green.

Table E-9. Future Project GHG Reductions (Scenario 4 - 2035)				
Measure Category	-- Objectives --			GHG Reduction [MT CO₂e]
	Penetration/ Participation	Reduction	Metric Reduced	
Parking Policy/Pricing	100%	10%	VMT	4,478
Trip and Vehicle Miles Reduction	100%	10%	VMT	4,478
Energy Efficiency	100%	20%	kW-hr/ therms	3,268
Waste Reduction and Recycling	100%	35%	tons solid waste	1,807
Lighting	100%	25%	kW-hr	1,612

Table E-10. Existing Development Reductions (Scenario 4 - 2035)

Measure Category	-- Objectives --			GHG Reduction [MT CO ₂ e]
	Penetration/ Participation	Reduction	Metric Reduced	
Energy Efficiency	95%	25%	kW-hr	18,268
	95%	25%	therms	
Transit System Improvements	95%	10%	VMT	18,555
Parking Policy/Pricing	92%	10%	VMT	13,849
Trip and Vehicle Miles Reduction	95%	20%	VMT	28,600
Alternative Powered Vehicles (Non-Maritime)	92%	20%	MT CO ₂ e	27,697
Alternative Energy Generation	100%	95%	kW-hr	124,508
Roadway System Management (All)	100%	5.0%	MT CO ₂ e	15,262
Roadway System Management (Maritime)	100%	7.5%	MT CO ₂ e	6,378

Note: Cells highlighted in blue represent further modifications from Scenario 1. Cells highlighted in purple represent further modifications from Scenario 2. Cell highlighted in green represent further modifications from Scenario 3.

For this 2035 scenario, to achieve a 25% reduction below 2006, the key reduction measures evaluated and included in Tables E-9 and E-10 represent 94% of all the projected GHG emissions reductions from the Port's evaluated reduction measures. In 2035, the other non-key measures, which are included in Table E-2 for the base case 2020 scenario, represent 6% of the GHG reductions. Note that the penetration/participation rate and reduction potentials for 2020 as presented in Table E-2 for the non-key measures were assumed to remain constant for the 2035 scenario. Within the key measure reductions, approximately 94% come from reduction measures targeting the existing operations and future Port projects and 6% are from reduction measures applicable to only future projects.

When the same reduction measure objectives (i.e., reduction potentials and penetration/participation rates) as defined above for Scenario 4 in 2035 are applied to the Port's projected 2050 GHG inventory, the projected reduction below 2006 was determined to be approximately 22%. Similar to the 2035 scenario, 94% of the projected

GHG reductions for the 2050 Scenario 4 result from the key reduction measures identified in Table E-3.

The Port's GHG emissions reductions from Scenario 4 in 2035 and 2050 are displayed in Figure E-2 below. This figure depicts the projected mitigated GHG emissions for 2035 and 2050 relative to the Port's 2006 baseline inventory and future projected inventories without reduction.

E.5 Conclusions Section

As discussed in Appendix D, the Work Group referred the potential options for GHG emissions reduction targets to the Port's Environmental Advisory Committee (EAC). The EAC discussed GHG emissions reduction targets as an agenda item at the February and March 2012 meetings. The recommendation passed in March by majority vote is as follows:

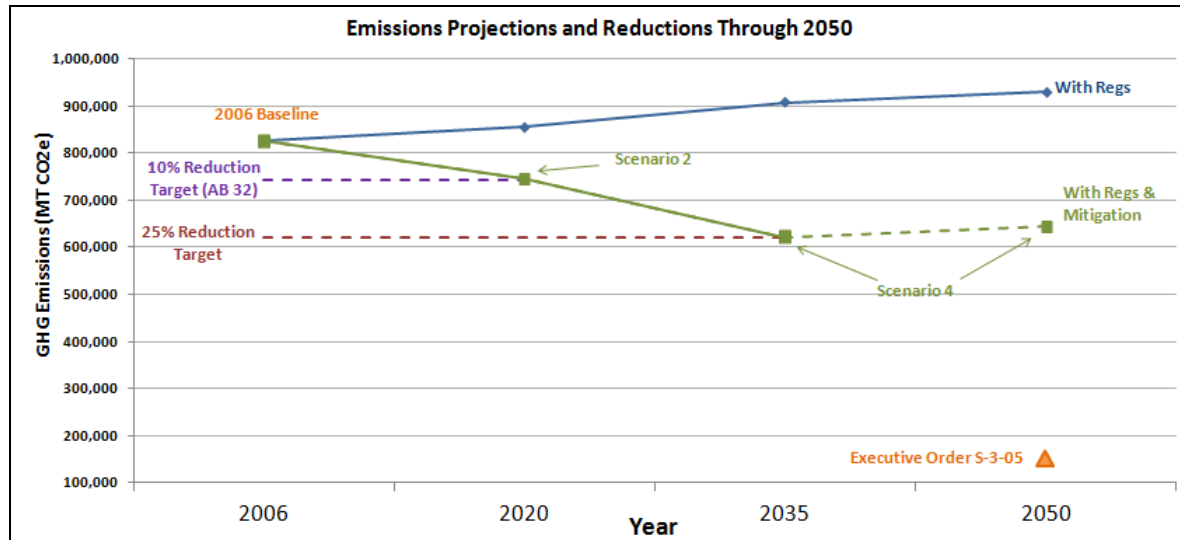
- 10% GHG emission reduction by 2020 (matching Scenario 2)
- 12% GHG emission reduction by 2025 (to be evaluated in future updates to the Climate Action Plan)
- 25% GHG emission reduction by 2035 (matching Scenario 4)
- No recommendation for 2050 (to be re-evaluated in future updates to the Climate Action Plan)

At its June 2012 meeting, the Board of Port Commissioners (the Board) discussed and recommended the following reduction targets for the Port's Climate Action Plan:

- 10% GHG emission reduction by 2020 (corresponding with the top down approach presented in Section D.2.2 and information presented in Scenario 2 above)
- 25% GHG emission reduction by 2035 (to revisit in future updates; corresponds with Scenario 4 presented above)
- Acknowledge statewide 2050 targets in plan, revisit in future updates

The Board's selection is reflected in this Climate Action Plan.

Figure E-2. Reduction Scenarios Beyond 2020



E.6 References

CAPCOA. 2010. Quantifying Greenhouse Gas Mitigation Measures; A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures. August.

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Table E-2
Base Case 2020 Reduction Measure Evaluation Summary
San Diego Unified Port District

Inventory Segment	Sector	Category	M ID ¹	Mitigation Measure Description	Penetration/ Participation	Reduction Potential	Sector Quantity ²	Reduction ³	Reduction Metric	GHG Reduction ⁴ [MT CO ₂ e]
FUTURE PROJECTS	ENERGY	Building Energy Use / Heat Gain and Shading	EB1	Establish green building standards and/or policy for new construction.	100%	20%	75,783,330	5,277,715	kW-hr	3,268
			EB3	Develop energy efficiency performance standards that achieve a greater reduction in energy use than otherwise required by state law.						
			EH1	Adopt a Heat Island Mitigation Plan that uses cool roofs, cool pavements, and strategically placed shade trees, and actively inspect and enforce state requirements for cool roofs on non-residential re-roofing projects.	100%		2,498,924	364,081	therms	
FUTURE PROJECTS	ENERGY	Building Energy Use	EB3	Energy efficient appliances. (This strategy under EB3 for appliances is evaluated separately from building energy use.)	100%	5%	11,635,560	581,778	kW-hr	178
					100%	5%	119,204	5,960	therms	
FUTURE PROJECTS	ENERGY	Lighting	EL1	Develop and implement performance standards for exterior lighting of commercial and industrial buildings and parking lots, which include minimum and maximum lighting levels while providing a safe environment.	100%	25%	25,552,656	6,388,164	kw-hr	1,612
			EL4	Replace light fixtures in Port owned facilities with lower energy bulbs such as fluorescent, LEDs, or CFLs.						
			EL5	Replace light fixtures in non-Port facilities with lower energy bulbs such as fluorescent, LEDs, or CFLs. (Measure ID changed to EB6 in final CAP)						
FUTURE PROJECTS	TRANSPORTATION	Parking Policy/Pricing	TP1	Adopt a comprehensive parking policy to capture the true cost of private vehicle use, discourage private vehicle use and encourage the use of alternative transportation.	100%	10%	123,601,766	12,360,177	VMT	5,031
			TP2	Event Parking Policies. Establish policies and programs to reduce onsite parking demand and promote ride-sharing and public transit at large events.						
FUTURE PROJECTS	TRANSPORTATION	Land Use/Community Design / Trip and Vehicle Miles Reduction	TL1	Promote infill and higher density development. (This measure was deleted during final CAP review.)	100%	10%	123,601,766	12,360,177	VMT	5,031
			TL2	Promote greater linkage between land uses and transit, as well as other modes of transportation. (Measure ID changed to TL1 in final CAP)						
			TL3	Increase bicycling and walking opportunities (safe infrastructure to priority destinations) as an alternative to driving. (Measure ID changed to TL2 in final CAP)						
			TV1	Implement trip reduction programs such as: * ride sharing * telecommuting and alternative work schedules * commute trip reduction marketing * employer-sponsored vanpool/shuttle						
FUTURE PROJECTS	TRANSPORTATION	Alternative Powered Vehicles & Vessels	TA1	Support and promote the use of alternate fueled, electric or hybrid Port owned vehicles and vessels (also includes cargo handling equipment, terminal and stationary equipment).	100%	2.5%	50,312	1,258	MT CO ₂ e	1,258
			TA2	Support and promote non-Port owned vehicles and vessels to achieve the lowest emissions possible, using a mix of alternative fueled, electric or hybrid technology.						
FUTURE PROJECTS	WATER	Water Recycling	WR1	Recycled Water Use: Establish programs and policies to increase the capture and use of recycled water.	100%	25%	43	11	million gal water	30
FUTURE PROJECTS	WATER	Water Conservation	WC1	Adopt a Water Conservation Strategy.	100%	20%	264	53	million gal water	169
FUTURE PROJECTS	SOLID WASTE	Waste Reduction and Recycling	SW1	Increase the diversion of solid waste from landfill disposal.	100%	35%	8,308	2,908	tons solid waste	1,807
			SW3	Develop policy to reduce the generation of solid waste.						

Table E-2
Base Case 2020 Reduction Measure Evaluation Summary
San Diego Unified Port District

Inventory Segment	Sector	Category	M I D ¹	Mitigation Measure Description	Penetration/ Participation	Reduction Potential	Sector Quantity ²	Reduction ³	Reduction Metric	GHG Reduction ⁴ [MT CO ₂ e]		
EXISTING DEVELOPMENT	ENERGY	Building Energy Use	EB2	Establish green building standards and/or policy for existing buildings.	30%	25%	189,809,408	14,235,706	kW-hr	5,769		
			EB3	Develop energy efficiency performance standards that achieve a greater reduction in energy use than otherwise required by state law.								
			EB4	Establish program/policy to encourage retrofit of existing buildings to reduce energy use.	30%	25%	5,457,003	409,275	therms			
			EB5	Energy Efficiency Funding: Increase awareness and coordinate use of incentives for tenants to invest in energy efficiency upgrades.								
EXISTING DEVELOPMENT	ENERGY	Alternative Energy Generation	EA1	Implement on-site renewable energy generation policy for 2020 (solar power, wind power, methane recovery, wave power etc.).	100%	5%	550,337,550	27,516,878	kW-hr	6,942		
			EA4	Establish policies and programs that facilitate the siting of new renewable energy generation.								
			EA5	Remove Barriers: Identify and remove or reduce barriers to renewable energy production, including: * Review and revise building and development codes, design guidelines, and zoning ordinances to remove barriers. * Work with related agencies, such as fire, water, health and others that may have policies or requirements that adversely impact the development or use of renewable energy technologies.								
			EA6	Pursue economic incentives and creative financing for renewable energy projects (such as a Solar Cooperative Purchasing Policy), as well as other support for tenants or developers seeking funding for such projects.								
			EA9	Reduce costs to permit alternative energy generation projects.								
			EA7	Promote co-generation (i.e., combined heat and power system) projects.	10%	13.5% -3.9%	550,337,550 27,775,478	7,429,557 -108,324	kW-hr therms	1,874 -576		
			EA8	Encourage the implementation of methane recovery systems that generate energy for use at landfills used by tenants.	10% increase capture efficiency		20,439	3,616	MT CO ₂ e	3,616		
			EA10	Develop clean, fuel cell distributed generation within Port Tidelands.	N/A - Future Advanced Technology							
			EA2	Implement on-site renewable energy generation policy for 2035 (solar power, wind power, methane recovery, wave power etc.).	N/A - Not evaluated for the 2020 Base Case Scenario							
			EA3	Implement on-site renewable energy generation policy for by 2050 (solar power, wind power, methane recovery, wave power etc.).	N/A - Not evaluated for the 2020 Base Case Scenario							
EXISTING DEVELOPMENT	ENERGY	Heat Gain and Shading	EH1	Adopt a Heat Island Mitigation Plan that uses cool roofs, cool pavements, and strategically placed shade trees, and actively inspect and enforce state requirements for cool roofs on non-residential re-roofing projects.	20%	20%	126,303,851	5,052,154	kW-hr	2,068		
			EH2	Urban Forestry Management: Develop an Urban Forestry Program to consolidate policies and ordinances regarding tree planting, maintenance, and removal, including: * comprehensive inventory and analysis of the urban forest. * tree-planting target and schedule to support goals of the California Climate Action Team to plant 5 million trees in urban areas by 2020. * Establish guidelines for tree planting (deciduous vs. evergreen, low-VOC-producing trees, drought-tolerant native trees and vegetation).		20%	3,729,906	149,196	therms			
			EH3	Evaluate existing landscaping and options to convert reflective and impervious surfaces to landscaping, and install or replace vegetation with drought-tolerant, low-maintenance native species that can also provide shade and reduce heat-island effects.								
EXISTING DEVELOPMENT	ENERGY	Lighting	EL1	Develop and implement performance standards for exterior lighting of commercial and industrial buildings and parking lots, which include minimum and maximum lighting levels while providing a safe environment.	Based on Port Energy Roadmap (2009)			57,749	kw-hr	15		
			EL2	Require the replacement of traffic lights with LED traffic lights.	Not evaluated. No quantification methodology.							
			EL3	Install occupancy sensors (Vending Misers) at soda machines.	Based on Port Energy Roadmap (2009)			11,351	kw-hr	3		
			EL4	Replace light fixtures in Port owned facilities with lower energy bulbs such as fluorescent, LEDs, or CFLs.	Based on Port Energy Roadmap (2009)			97,186	kw-hr	25		
			EL5	Replace light fixtures in non-Port facilities with lower energy bulbs such as fluorescent, LEDs, or CFLs. (Measure ID changed to EB6 in final CAP)	Not evaluated. No quantification methodology.							

Table E-2
Base Case 2020 Reduction Measure Evaluation Summary
San Diego Unified Port District

Inventory Segment	Sector	Category	M ID ¹	Mitigation Measure Description	Penetration/ Participation	Reduction Potential	Sector Quantity ²	Reduction ³	Reduction Metric	GHG Reduction ⁴ [MT CO ₂ e]
EXISTING DEVELOPMENT	TRANSPORTATION	Land Use/ Community Design	TL2	Promote greater linkage between land uses and transit, as well as other modes of transportation.		1%	414,555,192	4,145,552	VMT	1,691
			TL3	Increase bicycling and walking opportunities (safe infrastructure to priority destinations) as an alternative to driving.						
			TL4	Drive-Through Uses: Restrict the locations of drive-through businesses to reduce the impacts of vehicle idling on adjacent uses, such as housing, schools, and health care facilities.						
EXISTING DEVELOPMENT	TRANSPORTATION	Transit System Improvements	TT1	Encourage expansion of the transit network; both passenger transit and rail freight transportation.	20%	10%	538,156,959	10,763,139	VMT	4,389
			TT2	Encourage increased transit performance (e.g., frequency and speed).						
			TT3	Encourage implementation of transit access improvements.						
EXISTING DEVELOPMENT	TRANSPORTATION	Parking Policy/Pricing	TP1	Adopt a comprehensive parking policy to capture the true cost of private vehicle use, discourage private vehicle use and encourage the use of alternative transportation.	20%	10%	414,555,192	8,291,104	VMT	3,382
			TP2	Event Parking Policies. Establish policies and programs to reduce onsite parking demand and promote ride-sharing and public transit at large events.						
EXISTING DEVELOPMENT	TRANSPORTATION	Trip and Vehicle Miles Reduction	TV1	Implement trip reduction programs such as: * ride sharing * telecommuting and alternative work schedules * commute trip reduction marketing * employer-sponsored vanpool/shuttle	20%	20%	414,555,192	16,582,208	VMT	6,765
EXISTING DEVELOPMENT	TRANSPORTATION	Roadway System Management	TR1	Implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions on general roadways within Port tidelands.	100%	2.5%	314,490	7,862	MT CO ₂ e	7,862
			TR2	Implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions at maritime facilities.						
EXISTING DEVELOPMENT	TRANSPORTATION	Roadway System Management (Maritime)	TR2	Implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions at maritime facilities.	100%	5%	68,569	3,428	MT CO ₂ e	3,428
			TR3	Vehicle Idling: Enforce State idling laws for commercial vehicles, including delivery and construction vehicles.						
			TR4	Encourage rail freight utilization over trucks to reduce vehicle miles traveled.						
EXISTING DEVELOPMENT	TRANSPORTATION	Alternative Powered Vehicles (Non-Maritime)	TA1	Support and promote the use of alternate fueled, electric or hybrid Port owned vehicles and vessels (also includes cargo handling equipment, terminal and stationary equipment).	15%	20%	174,355	5,231	MT CO ₂ e	5,074
			TA2	Support and promote non-Port owned vehicles and vessels to achieve the lowest emissions possible, using a mix of alternative fueled, electric or hybrid technology.						

Table E-2
Base Case 2020 Reduction Measure Evaluation Summary
San Diego Unified Port District

Inventory Segment	Sector	Category	M I D ¹	Mitigation Measure Description	Penetration/ Participation	Reduction Potential	Sector Quantity ²	Reduction ³	Reduction Metric	GHG Reduction ⁴ [MT CO ₂ e]
EXISTING DEVELOPMENT	TRANSPORTATION	Alternative Powered Vehicles (Maritime/Industry)	TA2	Support and promote non-Port owned vehicles and vessels to achieve the lowest emissions possible, using a mix of alternative fueled, electric or hybrid technology.	5%	20%	94,292	943	MT CO ₂ e	943
			TA3	Implement emissions reduction strategies at loading docks through electrification of docks or idling-reduction systems for use while at loading docks.	5%	10%	68,569	343	MT CO ₂ e	343
			TA4	Electrification of marinas	10%	10%	5,308	53	MT CO ₂ e	53
			TA5	Develop and encourage use of shore power for ocean going vessels	Not evaluated in this table since shore power for ocean going vessels is a California regulatory requirement.					
			TA6	Develop and encourage use of shore power for tugs	Not evaluated. No quantification methodology.					
			TA7	Catenary/Induction-Driven Trucks for transporting cargo between the Port terminals and intermodal rail yards, distribution centers, and warehouses.	N/A - Future Advanced Technology					
			TA8	Alternative container transport systems such as Maglev to eliminate diesel-powered rail and truck transport to near-dock rail facilities.	N/A - Future Advanced Technology					
EXISTING DEVELOPMENT	TRANSPORTATION	Advanced Technologies/ Miscellaneous	TE1	Use of technologies and strategies to reduce fuel consumption such as installation of electronic engine and fuel management systems to reduce fuel consumption and cleaner vessel engines.	10%	10%	140,831	1,408	MT CO ₂ e	1,408
			TE2	Implement Vessel Speed Reduction for ocean going vessels	80%	2.0%	62,365	984	MT CO ₂ e	984
			TE3	Implement anti-idling restrictions for locomotives	100%	20%	38	8	MT CO ₂ e	8
			TE4	Promote best vehicle maintenance and operational best practices for Harbor Craft including routine engine monitoring.	N/A - Future Advanced Technology					
			TE5	Promote the application of advanced hull and propeller design in new ships and air cavity systems to reduce hull resistance.	N/A - Future Advanced Technology					
			TE6	Promote the use of flywheel technology for non-electric cranes.	N/A - Future Advanced Technology					
			TE7	Support and promote the use of advanced technologies for rail locomotives: * advanced technology diesel-fuel injectors * Tier 2 or Tier 3 locomotive engines * gen-set engines * hybrid or LNG locomotives	N/A - Future Advanced Technology					
			TE8	Solar power generators or alternative power generation systems for ocean going vessels to supply on-board electrical demand and propulsion.	N/A - Future Advanced Technology					
EXISTING DEVELOPMENT	WATER	Water Recycling	WR1	Recycled Water Use: Establish programs and policies to increase the capture and use of recycled water	25%	25%	71	4	million gal water	12
EXISTING DEVELOPMENT	WATER	Water Conservation	WC1	Adopt a Water Conservation Strategy.	25%	20%	2,946	147	million gal water	478
EXISTING DEVELOPMENT	SOLID WASTE	Waste Reduction and Recycling	SW1	Increase the diversion of solid waste from landfill disposal.	25%	35%	26,301	2,301	tons solid waste	1,337
			SW3	Develop policy to reduce the generation of solid waste.						
			SW2	Adopt a Construction and Demolition Recycling Ordinance.	Not evaluated. GHG emissions associated with construction and demolition waste are not evaluated in the Port's GHG inventory.					
EXISTING DEVELOPMENT	MISCELLANEOUS	Miscellaneous	M2	Carbon Sequestration. Develop program to conserve open space to preserve and promote the ability of such resources to remove carbon from the atmosphere. Identify and prioritize specific projects within the Port's jurisdiction that sequester carbon and provide other amenities, including wildlife habitat. Report on sequestered carbon.	Carbon sequestration estimated based on assumed number of trees planted			1,000	trees	35

Table E-2
Base Case 2020 Reduction Measure Evaluation Summary
San Diego Unified Port District

Inventory Segment	Sector	Category	M ID ¹	Mitigation Measure Description	Penetration/ Participation	Reduction Potential	Sector Quantity ²	Reduction ³	Reduction Metric	GHG Reduction ⁴ [MT CO ₂ e]
EXISTING DEVELOPMENT	MISCELLANEOUS	Miscellaneous	M1	Increase public awareness of climate change and climate protection challenges, and support community reductions of GHG emissions through coordinated, creative public education and outreach, and recognition of achievements.	N/A - Supporting Measure					
	MISCELLANEOUS	Miscellaneous	M3	Develop a Green Business Certification Program.	N/A - Supporting Measure					
	MISCELLANEOUS	Miscellaneous	M4	Ensure that Port Climate Mitigation and Adaptation Plan and Port Master Plan are aligned with, support, and enhance any regional plans that have been developed consistent with state guidance to achieve reductions in GHG emissions.	N/A - Supporting Measure					
	MISCELLANEOUS	Miscellaneous	M5	Require Port and encourage Port tenants to purchase goods and services that embody or create fewer GHG emissions.	N/A - Future Advanced Technology					
	MISCELLANEOUS	Miscellaneous	M6	Pursue off-site GHG mitigation strategies.	N/A - Future Advanced Technology					
	MISCELLANEOUS	Miscellaneous	M7	Active carbon capture and injection.	N/A - Future Advanced Technology					
	MISCELLANEOUS	Miscellaneous	M8	Develop Smart Grid and energy districts for Port operations and tenants	N/A - Future Advanced Technology					
	MISCELLANEOUS	Miscellaneous	M9	Develop a Green Lease standard.	N/A - Supporting Measure					

Notes:

- 1) "M ID" = the measure ID assigned to each mitigation measure as found in Appendix Table C-X.
- 2) The sector quantity was calculated for each sector from the activity data reported in the Port's future 2020 GHG inventory.
- 3) The reduction quantity represents the amount of the given reduction metric reduced by the mitigation measure(s) based on the assumed penetration/participate rate and reduction potential. The reduction calculation is described in more detail in Section E.2 of Appendix E.
- 4) The estimated GHG reductions are calculated consistent with methodologies discussed in Appendix B and Section E.2 of Appendix E.

Abbreviations

kw-hr - kilowatt-hour
gal - gallons
MT CO₂e - metric tons of carbon dioxide equivalents
N/A - not applicable or not evaluated

Appendix F - Implementation and Monitoring Plan for Greenhouse Gas Reduction

F.1 Introduction

To achieve the greenhouse gas (GHG) reduction goals set forth in this Climate Action Plan, the San Diego Unified Port District (the Port) will need to take steps to incorporate GHG reduction measures into its operations to make business operations more efficient and to set guidelines for future activities. The necessary steps involve both taking actions consistent with the Climate Action Plan and concurrently monitoring and evaluating measure implementation and resulting GHG reductions. The implementation and monitoring process described here address requirements of the California Environmental Quality Act (CEQA) Guidelines for climate action planning under §15183.5 as discussed in Appendix A (the Climate Action Plan's relationship to CEQA). The following sections in this Appendix outline a framework and steps for the Port to follow in putting this Climate Action Plan into practice, monitoring progress, and updating and improving implementation. It is important to note that guidelines for implementing GHG reduction measures are formalized in the Board of Port Commissioners Policy 750; this appendix simply provides background.

Section F.2 GHG Reduction Implementation Timeline, Process, and Progress

Reporting: Describes the timeline and process for achieving GHG reduction targets established in this Climate Action Plan and reporting progress.

Section F.3 GHG Reduction Measure Implementation Framework: Provides an overview of a structured approach for developing and implementing the various types of GHG reduction measures identified for the Climate Action Plan to achieve Port GHG reduction goals, identifies stakeholder involvement strategies, and identifies potential funding options.

Section F.4 GHG Reduction Performance Evaluation: Outlines the general steps for the Port to follow and provides recommendations for effectively evaluating and monitoring Climate Action Plan implementation and tracking progress toward meeting reduction targets.

Section F.5 Evolution of GHG Reduction: Discusses the need for iterative updates to the Climate Action Plan to realign the Port's plans based on revised Port-wide GHG inventory projections, changes in climate policy or GHG regulations, or development in new strategies for GHG reduction.

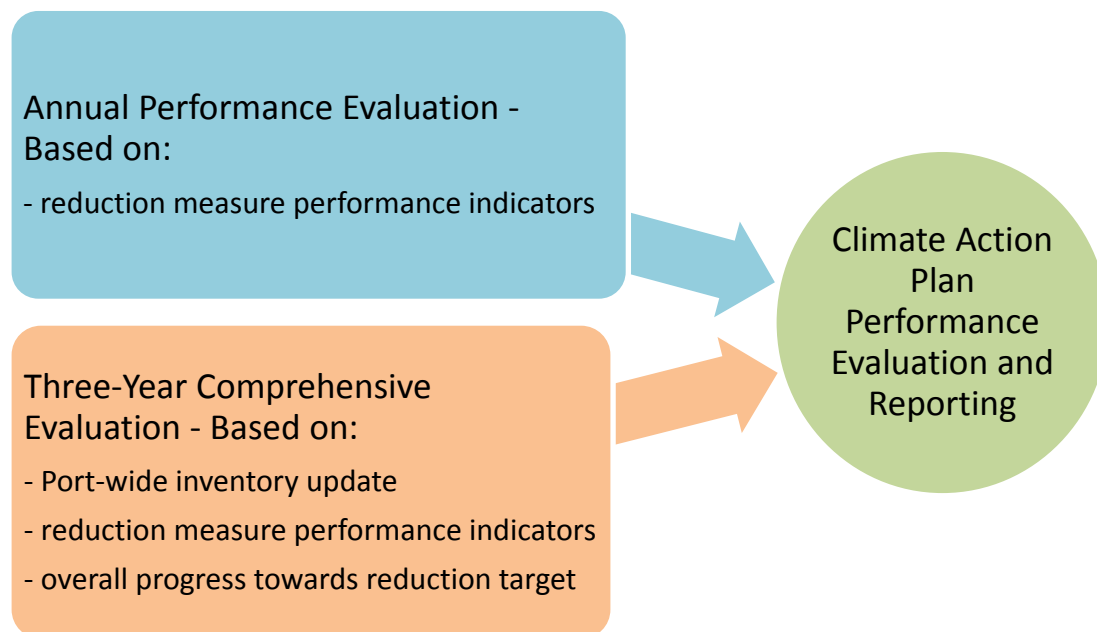
F.2 GHG Reduction Implementation - Timeline, Process, and Progress Reporting Timeline

Implementation will begin with the adoption of the Climate Action Plan by the Port's Board of Port Commissioners. The Port will begin measure implementation in accordance with the methods outlined in Board Policy 750. The measures categorized and prioritized per Board Policy 750 will be revisited at milestones determined by the Board in order to evaluate the success of initial measures at achieving reductions goals and/or further developments that may

increase the feasibility of these reduction measures. As described in Section F.5, future information on new measures and on lower priority measures are to be tracked in order to determine when and if these measures become ready for implementation by the Port.

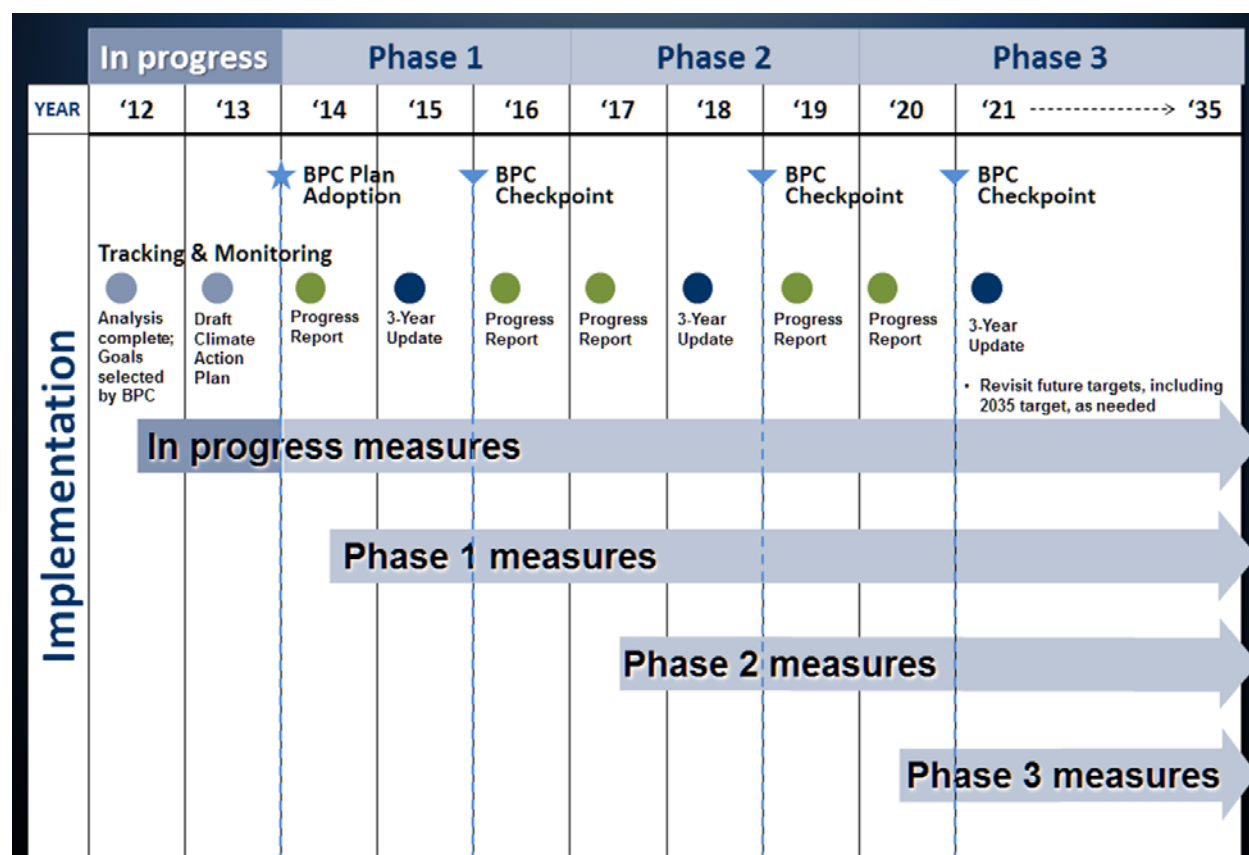
To track implementation progress, the Port will conduct performance assessments of both the individual measures and the Climate Action Plan as a whole. On an annual basis, the Port will conduct an evaluation to assess the performance of the Climate Action Plan and will prepare a progress report to document performance. On a three-year basis, the Port will conduct a more comprehensive evaluation of performance and overall progress and have a checkpoint with the Board of Port Commissioners. Figure F-1 summarizes the differences between the three-year comprehensive evaluation process and the annual performance evaluations to be performed in the interim years. Descriptions of the annual and three-year evaluations are provided below and in Section F.4.

Figure F-1. Reduction Measure Performance Evaluations



The Port will implement, evaluate, and update Climate Action Plan performance through 2020 and beyond according to the following timeline:

Figure F-2. Phased Implementation for GHG Reduction Measures



The implementation timeline is subject to revision or modification if Port staff determines that reductions are not on track to meet the Port's long term goals specified in the Climate Action Plan.

Annual Performance Evaluation

Between three-year comprehensive evaluations, an annual performance evaluation will be conducted using reduction measure performance indicators (indicator) as summarized in Figure F-1 for the original measures identified in Appendix C; indicators for new measures identified during Board Workshops held in 2013 will also be developed by the Port during implementation. Indicators are metrics that can be readily measured and correlated with reductions in GHG emissions to help determine progress towards reaching the Climate Action Plan targets. The indicator may be a measure of participation or activity associated with a reduction measure. For each measure with indicator metrics, the indicator will be compared to a predetermined

performance objective. The performance objective for each reduction measure is a specified level of participation or performance estimated to achieve the Climate Action Plan's projected GHG reduction targets. As part of the implementation process for each measure, the Port will finalize the indicator to be used, the process for data collection, and determine an appropriate target. A matrix of preliminary indicators for each reduction measure identified in Appendix C is provided in Table F-1.

An evaluation of indicators against targets will provide an assessment of individual measure performance and an indication of whether plan implementation is on track to achieve reduction targets. To make the performance evaluation process expeditious and efficient, the Port will develop tracking tool(s) to calculate estimated GHG emissions reductions based on measured performance indicators.

Three-Year Comprehensive Evaluation

An overall Climate Action Plan evaluation for GHG reductions will consist of a full update of the Port-wide GHG emissions inventory as shown in Figure F-1. While the annual performance evaluation will track the estimated GHG reductions and performance of specific measures, the Port-wide inventory is a more precise way to verify the Port's overall GHG reductions. This more intensive evaluation exercise will involve collecting information (e.g., activity and operational data) to refine and update the Port-wide GHG inventory and estimates of GHG reductions. The updated Port-wide GHG emissions inventory will allow the Port to more precisely understand the performance of individual measures and overall GHG emission reductions as a whole. By comparison with the Port's 2006 baseline inventory and projected 2020 inventory, the Port will track progress toward achieving the adopted GHG reduction target.

Progress Reporting

Following each evaluation process (annual and three-year evaluations), the Port will prepare a progress report to document the effectiveness of the Climate Action Plan implementation. The report will summarize the measure implementation efforts of the previous year(s), progress towards meeting performance targets, estimated GHG reductions, and areas for improvement in the next year. The progress report will be made available to the public via press releases, the Port's website, and/or updates to the Board of Port Commissioners.

F.3 GHG Reduction Measure Implementation Framework

The successful implementation of measures is critical to achieving the Climate Action Plan's GHG reduction goals. This section provides an overview of the general steps involved in implementing the various reduction measures and strategies for effectively engaging Port tenants, the community, and other stakeholders. The actual implementation steps for each measure will be determined by Port staff under direction of the Board of Port Commissioners.

For purposes of structuring a discussion of a generalized implementation and evaluation process, the Port's GHG reduction measures are categorized into two general types:

- *Advocacy reduction measures*: measures affecting changes to operational decisions, equipment, or physical infrastructure that are not directly under the Port's jurisdiction or control. To implement advocacy measures, the Port will need to work in conjunction with outside agencies or interest groups to achieve the goals of each reduction measure.
- *Action reduction measures*: measures that can be directly influenced or implemented by the Port. These measures are further categorized as either:
 - Action Policies: best practices and programs, or
 - Action Standards: establish detailed specifications and/or requirements.

The classification of each individual measure identified in Appendix C is provided in Table F-1. Classification of new measures identified during Board Workshops held in 2013 will also be developed by the Port during implementation. Note that for all reduction measures, the Port's authority and jurisdiction will need to be determined during measure implementation. The following three sections discuss a generalized process for implementing each type of reduction measure for illustrative purposes. The implementation process will be determined for each measure by Port staff under the direction of the Board of Port Commissioners.

As direct stakeholder involvement will be a part of the implementation process for many measures, a separate stakeholder involvement description is also included.

Advocacy Reduction Measures

Advocacy reduction measures are not directly under the Port's jurisdiction or control to implement as the authority to implement them resides with other lead agency(ies), and address (a) broader infrastructure changes or improvements of off-port activities affecting Port GHG emissions sources and (b) the operating activities of entities (both commercial and industrial) operating within the Port. External advocacy reduction measures include improvements to transportation network efficiency or waste management such as reducing congestion, improving public transportation, and enhancing methane capture and recovery efforts at landfills. Internal port-wide advocacy reduction measures address improvements to the operating decisions and standards maintained by the Port and its tenants such as creating public awareness of financial incentives for energy efficient activity or encouraging the use of available technologies or strategies that reduce GHG emissions such as hybrid vehicles or co-generation.

For each measure, the Port must first determine the appropriate department or individual to oversee the process. This Port lead shall identify other key stakeholders, commission necessary studies; determine the appropriate course of action; and work to achieve effective implementation. The table below outlines a general overview of the steps for establishing and implementing advocacy reduction measures and includes an example of how these steps translate into action for a traffic improvement measure.

Table F-2. Advocacy Reduction Measure General Implementation Framework	
Steps	SAMPLE Implementation: Transit Improvement (e.g., Measure TR1)
Identify Port lead - department or manager responsible for overseeing the measure implementation.	Port Government Relations, Maritime, and/or Environmental & Land Use Management
Identify lead coordinating agency and/or lead stakeholder groups.	San Diego Association of Governments (SANDAG)
Identify information needs and data gaps requiring further study.	Information on traffic movement inefficiencies within the Port tidelands.
Identify funding mechanism (may occur at multiple steps in the process).	Coordinate funding effort with SANDAG (e.g., state or federal grants).
Commission or encourage additional studies.	Encourage completion of traffic and engineering studies of potential areas for improvement.
Determine the form of the measure (e.g., infrastructure improvement, program, policy, ordinance, etc.).	Infrastructure improvement
Develop and establish a strategy or framework for implementing measure with agency and stakeholder groups if applicable.	Prioritize a listing of infrastructure improvements based on potential for GHG reductions and feasibility. Work with SANDAG and other stakeholders to advocate for implementation of high priority projects.
Identify measure performance target for monitoring.	For example: level of service, reductions in idling time, vehicle trips, and/or vehicle miles traveled that can be reported to the Port by the lead agency (SANDAG in this example)
Identify supporting measures.	Not Applicable
Coordinate implementation of measure strategies in collaboration with agency and stakeholder groups if applicable.	Work with SANDAG on the design and implementation of infrastructure improvements.

Action-Policy Reduction Measures

Action policies include operational best practices, goal-oriented programs, and strategies within the Port's jurisdiction. These broad programmatic decisions are instituted by the Port and could be accompanied by participation requirements encouraging or prohibiting a type of activity. Action policies can encourage energy efficient behavior by fostering a receptive environment or creating opportunities or programs to facilitate compliance. They can also take the form of a mandate such as actively enforcing existing laws or creating new restrictions. Examples of action policies include the Port's decision to pursue renewable energy generation, encouraging energy efficient retrofitting of existing buildings, encouraging reductions in onsite parking demand, and enforcement of vehicle idling laws. The table below outlines the process for establishing and implementing action policies and includes an example demonstrating how these steps translate into establishing an energy generation policy.

Table F-3. Action-Policy Reduction Measure General Implementation Framework	
Steps	SAMPLE Implementation: On-site Renewable Energy Generation Policy (e.g., Measure EA1)
Identify Port lead - department or manager responsible for overseeing the measure implementation.	Environmental & Land Use Management and/or Maritime
Identify lead coordinating agency and/or lead stake holder groups.	Port Tenants, Port's Environmental Advisory Committee, specific stakeholder group
Identify information needs and data gaps requiring further study.	Energy demand, technical feasibility, cost (capital and operational), location options, environmental impact
Identify funding mechanism (may occur at multiple steps in the process).	Review federal, state, regional grants
Commission or encourage additional studies.	Conduct research to address outstanding data gaps identified above (e.g., energy demand, cost, location options, etc.).
Determine the form of the measure (e.g., infrastructure improvement, program, policy, ordinance, etc.).	Policy
Develop and establish a strategy or framework for implementing measures with agency and stakeholder groups if applicable.	Define policy goals (short-term and long-term) and outline policy provisions to encourage renewable energy generation projects on Port tidelands.
Identify measure performance target for monitoring.	Megawatt-hour capacity of renewable generation
Identify supporting measures.	Measures EA4, EA5, and EA6
Coordinate implementation of measure strategies in collaboration with agency and stakeholder groups if applicable.	Finalize and adopt policy, promote public awareness, and provide informational resources to encourage compliance.

Action-Standards Reduction Measures

Action standards establish specific requirements or specifications to be met by the Port or its tenants. While action policies curtail or encourage general activities, action standards set forth detailed parameters. These standards are intended to govern how activities are conducted and involve establishing specific design procedures. Examples of implementing action standards include developing requirements for all new building construction or renovation projects on Port tidelands, setting specifications for lighting fixtures (e.g., LED or energy efficient light bulbs), or developing a green lease standard which builds certain energy efficiency, building operation, and sustainable building maintenance practices into lease renewals. The table below outlines the process for establishing and implementing action standards and includes an example of how these steps translate into developing an effective renewable energy generation standard.

Table F-4. Action-Standards Reduction Measure General Implementation Framework	
Steps	SAMPLE Implementation: Green Building Standards (e.g., Measure EB1 & EB2)
Identify Port lead - department or manager responsible for overseeing the measure implementation.	Environmental & Land Use Management and/or Real Estate
Identify lead coordinating agency and/or lead stakeholder groups.	Port's Environmental Advisory and/or Real Estate Committee, specific stakeholder group
Identify information needs and data gaps requiring further study.	Survey of existing buildings on Port tidelands and the relative efficiency of each building. Cost effectiveness. Lease renewal timeline. Available technologies. Existing green building benchmarks.
Identify funding mechanism (may occur at multiple steps in the process).	Not Applicable
Commission or encourage additional studies.	Conduct research to address outstanding data gaps identified above (e.g., energy demand, cost, location options, etc.).
Determine the form of the measure (e.g., infrastructure improvement, program, policy, ordinance, etc.).	Ordinance
Develop and establish a strategy or framework for implementing measures with agency and stakeholder groups if applicable.	Outline of ordinance to require meeting certain energy conservation/efficiency standards for buildings upon renewal of lease or construction of new buildings.
Identify measure performance target for monitoring.	% exceedence of Title 24 or square footage of building space complying with standard.
Identify supporting measures.	Measures EB3, EB4, EB5, EA5, EA6, EA9 and EA10
Coordinate implementation of measure strategies in collaboration with agency and stakeholder groups if applicable.	Finalize and adopt ordinance based on input from Board and stakeholders.

Stakeholder Involvement

During the development of this Climate Action Plan, the Port requested and received community involvement at work group meetings from stakeholders including member city residents, Port tenant businesses, regulators, environmental groups, and other interested parties. An integral element of implementing and achieving all the goals and performance targets of the Climate Action Plan will be the continued involvement of the Port's stakeholders. The implementation and adoption of the Port's GHG reduction measures will be more successful if the Port stakeholders clearly understand the desired goals and implementation process, and can contribute effectively to the process.

As outlined in the implementation framework described above, the Port will continue to actively seek stakeholder involvement. For example, through the Port's Environmental Advisory Committee or other committees and the Board of Port Commissioners, the Port will continue to provide stakeholders and interested parties the opportunity to:

- provide input and/or assistance to facilitate implementation of reduction measures;
- assist/provide funding opportunities for reduction measures.

The following outlines strategies for enhancing stakeholder participation in and performance of Port GHG reduction efforts:

- Educate and inform Port tenants about implementation strategies and ways in which they can support the GHG reduction goals through changes to operating decisions (e.g., decisions regarding energy efficient equipment and facility upgrades).
- Identify a central repository for information regarding Port programs, policies, ordinances, and general GHG management.
- Inform and update stakeholders regarding Climate Action Plan efforts via the Port's website, progress reports, and press releases.
- Continue implementing sustainability programs such as the Port's Green Business Network which promote participation in voluntary reduction measures. The Green Business Network in particular strives to be a resource for businesses that would like to increase their energy efficiency and sustainability efforts, and provides a means to track and recognize those businesses that have already made substantial progress.

This Climate Action Plan will align the Port's goals, actions, and policies to encourage a reduction in GHG emissions; however the Climate Action Plan's primary success will depend on the individuals and businesses working or operating within the Port tidelands.

Potential Funding Opportunities

This section provides examples of potential funding sources for the Port to consider for financing the costs of implementing GHG reduction measures. Cost for implementing measures may include initial startup, ongoing administration and oversight, and monitoring. The following list of potential general funding sources and financing mechanisms is based on a review of other California Climate Action Plans (CAPs). Other funding sources may also be available for various reduction measures. As outlined above, the general implementation framework includes a review of available funding sources and financing mechanisms as part of the reduction measure development process. Examples of potential funding sources include:

- U.S. Department of Energy
- U.S. Environmental Protection Agency
- California Energy Commission

- California Infrastructure and Economic Development Bank
- Air District & California Air Resources Board Grants
- San Diego Association of Governments
- San Diego Gas & Electric
- Parking fees

F.4 GHG Reduction Performance Evaluation

This section outlines steps and recommendations for the Port to follow to effectively coordinate performance indicator monitoring, comprehensive GHG inventory updates, and overall Climate Action Plan evaluations to track progress toward meeting reduction goals through a monitoring plan.

An integral component of successful monitoring will be the designation of monitoring staff responsible for overseeing the monitoring process and tracking each reduction measure as it is implemented. The monitoring staff will coordinate with the departments and/or individuals responsible for overseeing the implementation of each reduction measure. The monitoring staff will gather and document performance and activity data, estimate emissions reductions, evaluate reduction measure performance, and prepare progress reports. Recommendations for each step in this process are provided in the sections below. The process of GHG monitoring will vary by year depending on the type of performance evaluation required (i.e., performance indicator evaluation or GHG inventory update) as determined by Port staff.

Data Gathering

Data gathering is necessary to evaluate individual reduction measures and to update the Port's GHG inventory. The process of data collection will be an ongoing requirement of the Climate Action Plan implementation and monitoring. Details regarding data gathering efforts for performance indicators and Port-wide GHG inventory updates are discussed below.

Reduction Measure Performance Indicator Monitoring (Annual Performance Evaluation)

For each reduction measure, it will be necessary to collect performance indicator data. Identified Port monitoring staff will work with the departments or individual responsible for the implementation of each reduction measure to determine the most feasible and cost effective approach for collecting and documenting performance indicator data. If it is found infeasible to collect or track the recommended performance indicator, an alternative or surrogate indicator will be identified.

To make data collection as efficient as possible, the process should be institutionalized into the regular operations of each department responsible for collecting the data. A data collection schedule will be established and will define a deadline for finalizing data collection.

To facilitate data sharing between staff responsible for implementation and monitoring, a central repository for the data should be established (e.g., email address or online database). A

standard format for recording and sharing monitoring data should be mutually agreed on to avoid misinterpretation of data and ensure that data is provided in a ready to use format. It is recommended that the data management system align with Port systems and automate reporting where feasible.

Port-wide GHG Inventory Update (Three-Year Comprehensive Evaluation)

For the Port's future GHG emissions inventory updates, the Port will follow similar data gathering steps as were required for each sector of the baseline and projected GHG inventories. Details regarding the Port's GHG emissions inventory and data sources/needs are presented in Appendix B.

In addition to updating the activity data used to quantify each sector of the inventory, the Port should work toward refining the quantification methodologies, as needed. In the Port's baseline and projected GHG inventories documented in this plan, some sectors of the inventory are quantified based on metrics derived from available Port or tenant data and state or local data. While this is a common GHG quantification methodology, to the extent feasible, the Port's monitoring staff will coordinate the collection of data to update and refine the quantification metrics or to support alternative and more precise quantification methodologies, when available. A priority will be placed on the sectors of the GHG inventory that contribute most significantly to the overall inventory or are estimated based on data with the greatest uncertainty. As an example, an approach for refining the building energy use sector of the inventory would be to conduct surveys of the energy ratings of buildings on the Port tidelands. As another example, refinements to the recreational boating sector of the inventory could be done with more detailed survey data of activities on Port tidelands. As a continuing effort, the data gathering process should seek to fill data gaps in the Port's inventory to support the development of the most accurate emissions estimates possible.

Similar steps as outlined in the data gathering process for performance indicator monitoring should be taken to facilitate data collection, such as institutionalizing the collection process within each responsible department and establishing a standard format for reporting data.

GHG Emissions Quantification and Assessment

Emissions estimation is the process of evaluating emissions based on information collected through the data gathering process. A summary of GHG emissions quantification based on performance indicators and Port-wide GHG inventory updates are discussed below. Details on the quantification methods are found in the Port's Maritime Emission Inventory² and in Appendix B for Port and Port tenant operations.

Reduction Measure Performance Indicator Monitoring (Annual Performance Evaluation)

To evaluate emissions reductions of individual reduction measures, the Port may develop tracking tool(s) to calculate GHG emissions reductions based on performance indicators. The tool(s) will use metrics which correlate the indicators with GHG emissions levels. The tool(s) could both expedite and routinize the annual performance evaluation process. The tool(s)

² Port of San Diego. 2008. 2006 Emissions Inventory. March 2008. Prepared by Starcrest Consulting Group, LLC. Available online at: http://sandiegohealth.org/port/2006_emissions_inventory_final.pdf. Accessed July 23, 2012.

should be updated with each GHG inventory update to ensure that the most current metrics, assumptions, and methodologies are being used.

For each reduction measure, performance will be evaluated based on the estimated emissions reductions and against the reduction measure performance targets.

Port-wide GHG Inventory Updates (Three-Year Comprehensive Evaluation)

The comprehensive GHG inventory evaluation will consist of updating the Port-wide GHG emissions inventory described in the Port's Maritime Emission Inventory² and in Appendix B for Port and Port tenant operations. Where emissions quantification methodologies remain unchanged, just the activity data in the inventory will be updated. Where applicable, the GHG intensity factors and emission factors will also be revised to reflect the most current information. Fundamental inventory assumptions should be revisited and updated as necessary to ensure they remain representative of Port and tenant operations. As discussed in the data gathering section above, when new or more refined data become available, the Port will update the quantification metrics and methodologies used in the inventory.

As discussed in the implementation timeline, process, and progress reporting section above, the updated GHG emissions inventory will allow the Port to understand the performance of individual reduction measures and evaluate the Climate Action Plan as a whole. Each successive inventory will be tracked relative to the Port's 2006 baseline inventory. The baseline inventory is intended to be a benchmark for comparison.

Progress Reporting

The results of these updates will be incorporated into the progress reporting described in Section F.2. The information from these updates will allow the Port to describe progress towards meeting performance targets and estimated GHG reductions.

F.5 Evolution of GHG Reduction

The Climate Action Plan is a planning-level document that requires an iterative process of implementation, evaluation, and strategic updating. Future updates to the list of reduction measures and their categorization and prioritization will be done in accordance with the methods in Port Board's Policy 750. These updates would include results of reduction measure performance evaluations and advancement of technology allowing for new or enhanced reduction measures. For other elements of the Climate Action Plan to stay current and effective, the Port will need to critically review the results of the implementation and evaluation process and update and adapt the plan, as needed, going forward. Climate Action Plan updates may be necessary to address changes to the Port-wide GHG inventory methods, or changes in climate policy or GHG regulations. This is illustrated in Figure F-3.

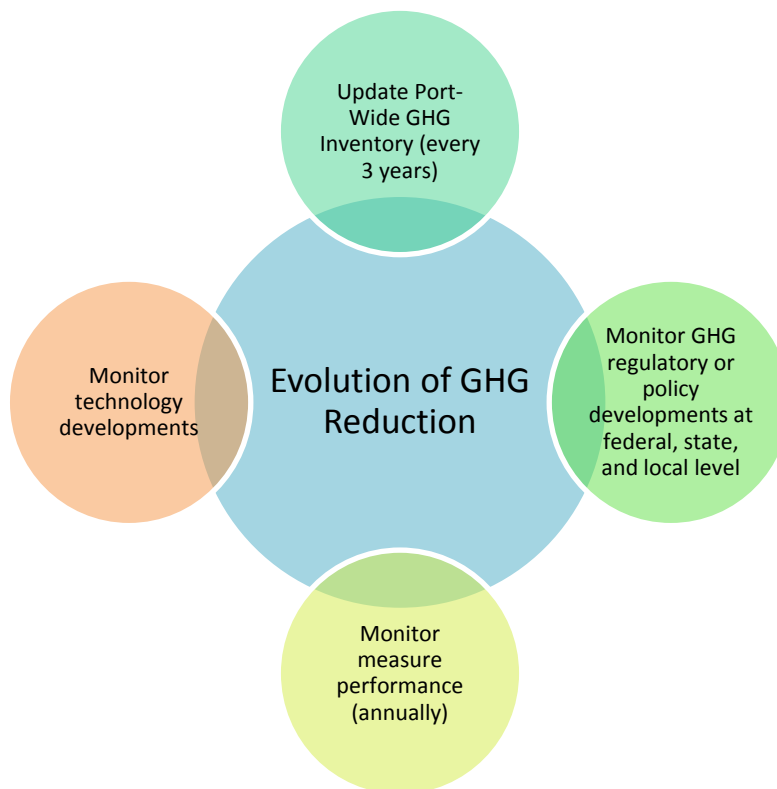


Figure F-3. Evolution of GHG Reduction

With each three-year comprehensive evaluation, the Port will critically evaluate and prescribe necessary changes to the original Climate Action Plan and GHG reduction measures to ensure this plan remains effective at meeting both short-term and long-term GHG reduction targets. This update schedule is suggested for routine plan maintenance and does not preclude any interim updates as they are deemed necessary by the Port.

This process will identify successful or high performing reduction measures to continue pursuing and reevaluate or replace underperforming reduction measures to manage the overall performance of the Climate Action Plan over time. For example, in the event that the performance evaluation process determines that the adopted GHG reduction target is not being achieved, the Port will evaluate secondary or new strategies for accelerating GHG emissions reductions. Budget, additional funding availability, and staff capacity will also be a consideration as the Climate Action Plan evolves. Secondary reduction strategies include new reduction measures or increasing reduction measure objectives of other measures in order to increase potential GHG emission reductions from existing measures. As reduction technologies advance, reduction measures with lower priority may also become more feasible to implement. In addition to previously identified secondary reduction measures, the Port will also explore potential new opportunities for GHG reduction which may not have previously been considered.

Once new reduction measures are identified, the implementation process will follow the steps outlined in the implementation framework section above.

F.6 References

Port of San Diego. 2008a. 2006 Emissions Inventory. March 2008. Prepared by Starcrest Consulting Group, LLC. Available from:
http://sandiegohealth.org/port/2006_emissions_inventory_final.pdf. Accessed July 23, 2012.

Table F-1
Reduction Measures Summary Table For Implementation
San Diego Unified Port District

Sector	Category	M ID	Description	Type of Measure (Port Action Vs. Port Advocacy)	Performance Indicators	Inventory Segment Future / Existing / Both	Inventory Metric Evaluated ¹	Key Measure (defined by target setting scenarios)	Reduction Potential Ranking ²
ENERGY	Building Energy Use	EB1	Establish green building standards and/or policy for new construction.	Port Action - Standard	Implementation of Standards Square footage of buildings	Future Projects	kW-hr / therms	✓	10
ENERGY	Building Energy Use	EB2	Establish green building standards and/or policy for existing buildings.	Port Action - Standard	Implementation of Standards Square footage of buildings	Existing Development	kW-hr / therms	✓	3
ENERGY	Building Energy Use	EB3	Develop energy efficiency performance standards that achieve a greater reduction in energy use than otherwise required by state law.	Port Action - Standard	Implementation of Standards Square footage of buildings Number of tenants	Both	kW-hr / therms	✓	3
ENERGY	Building Energy Use	EB4	Establish program/policy to encourage retrofit of existing buildings to reduce energy use.	Port Action - Policy	Square footage of building space retrofitted.	Existing Development	kW-hr / therms	✓	3
ENERGY	Building Energy Use	EB5	Energy Efficiency Funding: Increase awareness and coordinate use of incentives for tenants to invest in energy efficiency upgrades.	Port Advocacy	Supporting Measure Square footage of building space upgraded.	Both	kW-hr / therms	✓	3
ENERGY	Alternative Energy Generation	EA1	Implement on-site renewable energy generation policy for 2020 (solar power, wind power, methane recovery, wave power etc.).	Port Action - Policy	MW of installed renewable energy	Both	kW-hr	✓	1
ENERGY	Alternative Energy Generation	EA2	Implement on-site renewable energy generation policy for 2035 (solar power, wind power, methane recovery, wave power etc.).	Port Action - Policy	MW of installed renewable energy	Both	kW-hr		
ENERGY	Alternative Energy Generation	EA3	Implement on-site renewable energy generation policy for 2050 (solar power, wind power, methane recovery, wave power etc.).	Port Action - Policy	MW of installed renewable energy	Both	kW-hr		
ENERGY	Alternative Energy Generation	EA4	Establish policies and programs that facilitate the siting of new renewable energy generation.	Port Action - Policy	Supporting Measure	Both	kW-hr	✓	1
ENERGY	Alternative Energy Generation	EA5	Remove Barriers: Identify and remove or reduce barriers to renewable energy production, including: * Review and revise building and development codes, design guidelines, and zoning ordinances to remove barriers. * Work with related agencies, such as fire, water, health and others that may have policies or requirements that adversely impact the development or use of renewable energy technologies.	Port Action - Policy	Supporting Measure	Both	kW-hr		
ENERGY	Alternative Energy Generation	EA6	Pursue economic incentives and creative financing for renewable energy projects (such as a Solar Cooperative Purchasing Policy), as well as other support for tenants or developers seeking funding for such projects.	Port Action - Policy	Supporting Measure	Both	kW-hr	✓	1

Table F-1
Reduction Measures Summary Table For Implementation
San Diego Unified Port District

Sector	Category	M ID	Description	Type of Measure (Port Action Vs. Port Advocacy)	Performance Indicators	Inventory Segment Future / Existing / Both	Inventory Metric Evaluated ¹	Key Measure (defined by target setting scenarios)	Reduction Potential Ranking ²
ENERGY	Alternative Energy Generation	EA7	Promote co-generation (i.e., combined heat and power system) projects.	Port Advocacy	Supporting Measure MW of installed co-generation capacity	Both	kW-hr / therms		
ENERGY	Alternative Energy Generation	EA8	Encourage the implementation of methane recovery systems that generate energy for use at landfills used by tenants.	Port Advocacy	Supporting Measure % Capture rate and Landfill or MW of Landfill gas generation	Both	MT CO2e		
ENERGY	Alternative Energy Generation	EA9	Reduce costs to permit alternative energy generation projects.	Port Action - Policy	Supporting Measure	Both	kW-hr	✓	1
ENERGY	Alternative Energy Generation	EA10	Develop clean, fuel cell distributed generation within Port Tidelands.	Port Advocacy	TBD - Future Advanced Technology	Both	NA		
ENERGY	Heat Gain and Shading	EH1	Adopt a Heat Island Mitigation Plan that uses cool roofs, cool pavements, and strategically placed shade trees, and actively inspect and enforce state requirements for cool roofs on non-residential re-roofing projects.	Port Action - Policy	Sq footage and/or number of buildings complying with plan or meeting a specified standard	Both	kW-hr / therms	✓	10
ENERGY	Heat Gain and Shading	EH2	Urban Forestry Management: Develop an Urban Forestry Program to consolidate policies and ordinances regarding tree planting, maintenance, and removal, including: * comprehensive inventory and analysis of the urban forest. * tree-planting target and schedule to support goals of the California Climate Action Team to plant 5 million trees in urban areas by 2020. * Establish guidelines for tree planting (deciduous vs. evergreen, low-VOC-producing trees, drought-tolerant native trees and vegetation).	Port Action - Policy	Number of trees planted	Both	kW-hr / therms		
ENERGY	Heat Gain and Shading	EH3	Evaluate existing landscaping and options to convert reflective and impervious surfaces to landscaping, and install or replace vegetation with drought-tolerant, low-maintenance native species that can also provide shade and reduce heat-island effects.	Port Action - Policy	Area converted (e.g., acres)	Existing Development	kW-hr / therms		
ENERGY	Lighting	EL1	Develop and implement performance standards for exterior lighting of commercial and industrial buildings and parking lots, which include minimum and maximum lighting levels while providing a safe environment.	Port Action - Standard	% of buildings or building square footage upgraded	Both	kW-hr	✓	12
ENERGY	Lighting	EL2	Require the replacement of traffic lights with LED traffic lights.	Port Action - Standard	% of traffic lights replaced	Existing Development	kW-hr		
ENERGY	Lighting	EL3	Install occupancy sensors (Vending Misers) at soda machines.	Port Action - Policy	% of vending machines upgraded	Both	kW-hr		
ENERGY	Lighting	EL4	Replace light fixtures in Port owned facilities with lower energy bulbs such as fluorescent, LEDs, or CFLs.	Port Action - Standard	Building square footage upgraded	Both	kW-hr	✓	12
ENERGY	Lighting	EL5	Replace light fixtures in non-Port facilities with lower energy bulbs such as fluorescent, LEDs, or CFLs. (Measure ID changed to EB6 in final CAP)	Port Action - Standard	Building square footage upgraded	Both	kW-hr	✓	12

Table F-1
Reduction Measures Summary Table For Implementation
San Diego Unified Port District

Sector	Category	M ID	Description	Type of Measure (Port Action Vs. Port Advocacy)	Performance Indicators	Inventory Segment Future / Existing / Both	Inventory Metric Evaluated ¹	Key Measure (defined by target setting scenarios)	Reduction Potential Ranking ²
TRANSPORTATION	Land Use/Community Design	TL1	Promote infill and higher density development. (This measure was deleted during final CAP review.)	Port Action - Policy	Acres with new higher density development	Future Projects	VMT	✓	9
TRANSPORTATION	Land Use/Community Design	TL2	Promote greater linkage between land uses and transit, as well as other modes of transportation. (Measure ID changed to TL1 in final CAP)	Port Advocacy	Transit ridership counts	Both	VMT	✓	9
TRANSPORTATION	Land Use/Community Design	TL3	Increase bicycling and walking opportunities (safe infrastructure to priority destinations) as an alternative to driving. (Measure ID changed to TL2 in final CAP)	Port Action - Policy	Miles of bicycle routes	Both	VMT	✓	9
TRANSPORTATION	Land Use/Community Design	TL4	Drive-Through Uses: Restrict the locations of drive-through businesses to reduce the impacts of vehicle idling on adjacent uses, such as housing, schools, and health care facilities. (Measure ID changed to TL3 in final CAP)	Port Action - Standard	Supporting Measure	Future Projects	VMT		
TRANSPORTATION	Transit System Improvements	TT1	Encourage expansion of the transit network; both passenger transit and rail freight transportation.	Port Advocacy	Transit ridership counts Rail freight volumes	Both	VMT	✓	6
TRANSPORTATION	Transit System Improvements	TT2	Encourage increased transit performance (e.g., frequency and speed).	Port Advocacy	% reduction in VMT	Both	VMT	✓	6
TRANSPORTATION	Transit System Improvements	TT3	Encourage implementation of transit access improvements.	Port Advocacy	Transit ridership counts	Both	VMT	✓	6
TRANSPORTATION	Parking Policy/Pricing	TP1	Adopt a comprehensive parking policy to capture the true cost of private vehicle use, discourage private vehicle use and encourage the use of alternative transportation.	Port Action - Policy	Increase in street parking prices % reduction in parking provisions	Both	VMT	✓	8
TRANSPORTATION	Parking Policy/Pricing	TP2	Event Parking Policies. Establish policies and programs to reduce onsite parking demand and promote ride-sharing and public transit at large events.	Port Action - Policy	Reduction of trips per event	Both	VMT	✓	8
TRANSPORTATION	Trip and Vehicle Miles Reduction	TV1	Implement trip reduction programs such as: * ride sharing * telecommuting and alternative work schedules * commute trip reduction marketing * employer-sponsored vanpool/shuttle	Port Advocacy	% reduction in VMT % participation	Both	VMT	✓	4
TRANSPORTATION	Roadway System Management	TR1	Implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions on general roadways within Port tidelands.	Port Advocacy	Level of service % reduction in VMT	Both	MT CO2e / VMT	✓	2
TRANSPORTATION	Roadway System Management	TR2	Implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions at maritime facilities.	Port Action - Policy	Level of service % reduction in VMT	Both	MT CO2e / VMT	✓	2

Table F-1
Reduction Measures Summary Table For Implementation
San Diego Unified Port District

Sector	Category	M ID	Description	Type of Measure (Port Action Vs. Port Advocacy)	Performance Indicators	Inventory Segment Future / Existing / Both	Inventory Metric Evaluated ¹	Key Measure (defined by target setting scenarios)	Reduction Potential Ranking ²
TRANSPORTATION	Roadway System Management	TR3	Vehicle Idling: Enforce State idling laws for commercial vehicles, including delivery and construction vehicles.	Port Action - Policy	Number of tenants joining program to comply	Both	MT CO2e	✓	7
TRANSPORTATION	Roadway System Management	TR4	Encourage rail freight utilization over trucks to reduce vehicle miles traveled.	Port Advocacy	Number of tenants complying Rail freight volumes vs. truck volumes	Both	MT CO2e / VMT	✓	7
TRANSPORTATION	Alternative Powered Vehicles & Vessels	TA1	Support and promote the use of alternate fueled, electric or hybrid Port owned vehicles and vessels (also includes cargo handling equipment, terminal and stationary equipment).	Port Action - Policy	% of fleet powered Number of charging stations	Both	MT CO2e	✓	5
TRANSPORTATION	Alternative Powered Vehicles & Vessels	TA2	Support and promote non-Port owned vehicles and vessels to achieve the lowest emissions possible, using a mix of alternative fueled, electric or hybrid technology.	Port Advocacy	Number of charging stations Number of alternative vehicles	Both	MT CO2e	✓	5
TRANSPORTATION	Alternative Powered Vehicles & Vessels	TA3	Implement emissions reduction strategies at loading docks through electrification of docks or idling-reduction systems for use while at loading docks.	Port Action - Policy	% of loading docks	Both	MT CO2e		
TRANSPORTATION	Alternative Powered Vehicles & Vessels	TA4	Electrification of marinas	Port Action - Policy	Number of marinas electrified Number of slips	Both	MT CO2e		
TRANSPORTATION	Alternative Powered Vehicles & Vessels	TA5	Develop and encourage use of shore power for ocean going vessels	Port Action - Policy	% or number of vessels	Both	Vessel Calls		
TRANSPORTATION	Alternative Powered Vehicles & Vessels	TA6	Develop and encourage use of shore power for tugs	Port Action - Policy	% of fleet complying	Both	N/A		
TRANSPORTATION	Alternative Powered Vehicles & Vessels	TA7	Catenary/Induction-Driven Trucks for transporting cargo between the Port terminals and intermodal rail yards, distribution centers, and warehouses.	Port Advocacy	TBD - Future Advanced Technology	Both	N/A		
TRANSPORTATION	Alternative Powered Vehicles & Vessels	TA8	Alternative container transport systems such as Maglev to eliminate diesel-powered rail and truck transport to near-dock rail facilities.	Port Advocacy	TBD - Future Advanced Technology	Both	N/A		
TRANSPORTATION	Advanced Technology/Miscellaneous	TE1	Use of technologies and strategies to reduce fuel consumption such as installation of electronic engine and fuel management systems to reduce fuel consumption and cleaner vessel engines.	Port Advocacy	% or number of trucks and/or vessels with reduced fuel consumption technologies	Both	MT CO2e		
TRANSPORTATION	Advanced Technology/Miscellaneous	TE2	Implement Vessel Speed Reduction for ocean going vessels	Port Action - Policy	Compliance rate (%)	Both	MT CO2e		
TRANSPORTATION	Advanced Technology/Miscellaneous	TE3	Implement anti-idling restrictions for locomotives	Port Action - Policy	Number of tenants joining program to comply	Both	MT CO2e		

Table F-1
Reduction Measures Summary Table For Implementation
San Diego Unified Port District

Sector	Category	M ID	Description	Type of Measure (Port Action Vs. Port Advocacy)	Performance Indicators	Inventory Segment Future / Existing / Both	Inventory Metric Evaluated ¹	Key Measure (defined by target setting scenarios)	Reduction Potential Ranking ²
TRANSPORTATION	Advanced Technology/Miscellaneous	TE4	Promote best vehicle maintenance and operational best practices for Harbor Craft including routine engine monitoring.	Port Advocacy	TBD - Future Advanced Technology	Both	N/A		
TRANSPORTATION	Advanced Technology/Miscellaneous	TE5	Promote the application of advanced hull and propeller design in new ships and air cavity systems to reduce hull resistance.	Port Advocacy	TBD - Future Advanced Technology	Both	N/A		
TRANSPORTATION	Advanced Technology/Miscellaneous	TE6	Promote the use of flywheel technology for non-electric cranes.	Port Advocacy	TBD - Future Advanced Technology	Both	N/A		
TRANSPORTATION	Advanced Technology/Miscellaneous	TE7	Support and promote the use of advanced technologies for rail locomotives: * advanced technology diesel-fuel injectors * Tier 2 or Tier 3 locomotive engines * gen-set engines * hybrid or LNG locomotives	Port Advocacy	TBD - Future Advanced Technology	Both	N/A		
TRANSPORTATION	Advanced Technology/Miscellaneous	TE8	Solar power generators or alternative power generation systems for ocean going vessels to supply on-board electrical demand and propulsion.	Port Advocacy	TBD - Future Advanced Technology	Both	N/A		
WATER	Water Recycling	WR1	Recycled Water Use: Establish programs and policies to increase the capture and use of recycled water	Port Action - Policy	% reduction in outdoor water usage	Both	million gal water		
WATER	Water Conservation	WC1	Adopt a Water Conservation Strategy.	Port Action - Policy	% reduction in total water usage	Both	million gal water		
SOLID WASTE	Waste Reduction and Recycling	SW1	Increase the diversion of solid waste from landfill disposal.	Port Action - Policy	% increase in diversion % decrease in waste to landfill adopting of ordinance	Both	tons solid waste	✓	11
SOLID WASTE	Waste Reduction and Recycling	SW2	Adopt a Construction and Demolition Recycling Ordinance.	Port Action - Standard	% of construction/demo materials recycled.	Both	N/A		
SOLID WASTE	Waste Reduction and Recycling	SW3	Develop policy to reduce the generation of solid waste.	Port Action - Policy	% decrease in waste to landfill	Both	tons solid waste	✓	11
MISCELLANEOUS	Miscellaneous	M1	Increase public awareness of climate change and climate protection challenges, and support community reductions of GHG emissions through coordinated, creative public education and outreach, and recognition of achievements.	Port Advocacy	Supporting Measure	Both	N/A		
MISCELLANEOUS	Miscellaneous	M2	Carbon Sequestration. Develop program to conserve open space to preserve and promote the ability of such resources to remove carbon from the atmosphere. Identify and prioritize specific projects within the Port's jurisdiction that sequester carbon and provide other amenities, including wildlife habitat. Report on sequestered carbon	Port Advocacy	Number of trees planted	Both	trees planted		
MISCELLANEOUS	Miscellaneous	M3	Develop a Green Business Certification Program.	Port Action - Policy	Supporting Measure	Both	N/A		
MISCELLANEOUS	Miscellaneous	M4	Ensure that Port Climate Mitigation and Adaptation Plan and Port Master Plan are aligned with, support, and enhance any regional plans that have been developed consistent with state guidance to achieve reductions in GHG emissions.	Port Action - Policy	Supporting Measure	Both	N/A		

Table F-1
Reduction Measures Summary Table For Implementation
San Diego Unified Port District

Sector	Category	M ID	Description	Type of Measure (Port Action Vs. Port Advocacy)	Performance Indicators	Inventory Segment Future / Existing / Both	Inventory Metric Evaluated ¹	Key Measure (defined by target setting scenarios)	Reduction Potential Ranking ²
MISCELLANEOUS	Miscellaneous	M5	Require Port and encourage Port tenants to purchase goods and services that embody or create fewer GHG emissions.	Port Action - Policy	TBD - Future Advanced Technology (Currently voluntary as part of green business challenge)	Both	N/A		
MISCELLANEOUS	Miscellaneous	M6	Pursue off-site GHG mitigation strategies	Port Advocacy	TBD - Future Advanced Technology	Both	N/A		
MISCELLANEOUS	Miscellaneous	M7	Active carbon capture and injection.	Port Advocacy	TBD - Future Advanced Technology	Both	N/A		
MISCELLANEOUS	Miscellaneous	M8	Develop Smart Grid and energy districts for Port operations and tenants	Port Advocacy	TBD - Future Advanced Technology	Both	N/A		
MISCELLANEOUS	Miscellaneous	M9	Develop a Green Lease standard.	Port Action - Standard	Supporting Measure (To be identified in Green Lease requirements)	Both	N/A		

Notes:

- 1) N/A indicates that a reasonable estimate of the GHG reductions from the measure is not feasible at this time.
2) Ranking is based on the Port's 2020 greenhouse gas reduction target.

Measure Key:

	Indicates a mitigation measure categorized as Port Advocacy
	Indicates a mitigation measure categorized as a Port Action - Standard
	Indicates a mitigation measure categorized as a Port Action - Policy

Appendix G—Public Process

G.1 Introduction

As described in Appendix A, California Environmental Quality Act (CEQA) guidelines for greenhouse gas (GHG) emissions reduction plans, have been developed by the California Office of Planning and Research (OPR) and adopted by the California Natural Resources Agency (CNRA). The guidelines (CEQA Guidelines § 15183.5) specify that a GHG reduction plan such as the San Diego Unified Port Districts' (Port's) Climate Action Plan should include or address specific elements. One of these elements is that the plan be adopted in a public process, following environmental review. To address this element, the Port's Climate Action Plan has been developed with community involvement through a series of work group and public meetings. After environmental review, the Board of Port Commissioners will consider whether to adopt the Climate Plan in a public Board meeting.

This Appendix presents a summary of the Port's 2010-2013 public process during the development of the Climate Action Plan including meetings held through the Port's ad hoc Climate and Energy Work Group (Work Group) and Environmental Advisory Committee (EAC), as well as evening meetings held to further inform and engage the general public on the Port's efforts.

In 2013, the Port held a series of Board Workshops specific to the Climate Action Plan. During these workshops, the Port's Commissioners provided direction to staff on policies, mitigation measures, and evaluation criteria. In addition, the public provided feedback on content of the Plan, including additional measures to be included in the Climate Action Plan. The changes from the 2013 Board Workshops are reflected in the Climate Action Plan. The public comments received during the 2013 Board Workshops was documented in public Board packets prepared for the Workshop meetings and are available on the internet.¹

G.2 Climate and Energy Work Group

The Port was committed to having an open, public process during the development of the Climate Action Plan. The primary setting the Port engaged stakeholders was through the Climate and Energy Work Group. The Work Group was a subcommittee of the Port's EAC and served as an advisory group to the Port. The Work Group provided input on all key Climate Action Plan milestones and decisions including the selection of the GHG baseline year, scope of the Port's inventory, potential GHG mitigation measures, evaluation criteria, and GHG emissions reduction targets (see Table G-1 for a complete list).

The Work Group was an ad hoc, informal group that consisted of technical experts, Port tenants, local residents, member city representatives, environmental groups, and other interested parties. Work Group meetings were also open to the general public. Parties represented at one or more Work Group meetings included: California Center for Sustainable

¹ <http://www.portofsandiego.org/read-board-agendas.html>

Energy, City of Chula Vista, City of San Diego, Environmental Health Coalition, Industrial Environmental Association, Nature Conservancy, Port Tenants Association, San Diego Foundation, San Diego Gas and Electric, Sierra Club, US Fish and Wildlife Services, and University of San Diego's Energy Policy Initiatives Center.

G.3 Climate Action Plan Public Meetings

The Port conducted a series of meetings on the Climate Action Plan during its development. This included a series of Work Group meetings to provide direction on the Climate Action Plan's technical components, evening meetings for the general public, and updates and direction from the Port's EAC and Board of Port Commissioners meetings. In 2013, it also included a series of three Board of Port Commissioner Workshops. These Climate Action Plan-related meetings are summarized in Table G-1 along with general topics and decisions made during that Climate Action Plan development, which are discussed further in the next section.

Table G-1. Summary of Climate Action Plan Development Meetings Open to the Public			
Meeting Date	Meeting Type	Meeting Topic/Goal	Direction/Input
7/29/2010	Climate & Energy Work Group (WG)*	<ul style="list-style-type: none"> • Staff introduction to the proposed Climate Action Plan and Climate Adaptation Plan contract solicitation 	<ul style="list-style-type: none"> • Move forward as soon as possible on the process to select a consultant and award a contract • Select a single consulting team to complete project
9/7/2010	Board of Port Commissioners Meeting	<ul style="list-style-type: none"> • Approval of consultant agreement to develop Climate Action Plan and Climate Adaptation Plan 	<ul style="list-style-type: none"> • Agreement approved
9/30/2010	Climate & Energy WG	<ul style="list-style-type: none"> • Introduction to selected consultant (ENVIRON) • Overview of Climate Action Plan development, mitigation legislation, regional benchmarking, and schedule. 	
10/28/2010	Climate & Energy WG	<ul style="list-style-type: none"> • Introduction to the Climate Action Plan. Includes data gaps, elements to be included in inventory, baseline year, and future projections methodology 	<ul style="list-style-type: none"> • 2006 selected as GHG inventory baseline year • Scope of Port GHG inventory was finalized
4/5/2011	Environmental Advisory Committee*	<ul style="list-style-type: none"> • Update on the Climate Action Plan 	
6/2/2011	Climate & Energy WG	<ul style="list-style-type: none"> • Presentation and discussion of the 2006 GHG baseline inventory and 2020, 2050 	<ul style="list-style-type: none"> • Separate out South Bay Power Plant in baseline GHG inventory

Table G-1. Summary of Climate Action Plan Development Meetings Open to the Public

Meeting Date	Meeting Type	Meeting Topic/Goal	Direction/Input
		projections • Review first draft of mitigation measures	• Incorporate additional mitigation measures received from WG
6/7/2011	Environmental Advisory Committee	• Update on Climate Action Plan - emissions inventory update	
6/9/2011	Climate Action Plan Public Meeting	• Introduction to climate change and the Port's Climate Action Plan	• General comments heard
8/2/2011	Environmental Advisory Committee	• Update on Climate Action Plan	
8/17/2011	Climate & Energy WG	• Review and provide comments on adaptation vulnerability matrices	• Make changes to the vulnerability matrices as discussed during the WG meeting
9/20/2011	Environmental Advisory Committee	• Update on Climate Action Plan	• Request that staff provide updates at each EAC meeting and coordinate with other local agencies
10/5/2011	Climate & Energy WG	<ul style="list-style-type: none"> • Discussion of the mitigation measures, specifically the identification, analysis, and categorization • Discussion of potential GHG reduction targets and the process (top down, bottom up, etc) • Request comments from WG on mitigation strategies by October 17th, 2011 	<ul style="list-style-type: none"> • ENVIRON to complete additional 2020 GHG reduction target scenarios: 7.5%, 10%, and 12% reduction from 2006 and 25% reduction from 2006 by 2035 • Update GHG inventory for recreational boating with new information • Accepted WG comments on mitigation measure categorization
10/18/2011	Environmental Advisory Committee	• Update on Climate Action Plan	
11/15/2011	Environmental Advisory Committee	<ul style="list-style-type: none"> • Update on Climate Action Plan • Targets 	
12/1/2011	Climate Action Plan Public Meeting	<ul style="list-style-type: none"> • Update on Climate Action Plan • Mitigation measure prioritization 	• "Voted" on priority mitigation measures

Table G-1. Summary of Climate Action Plan Development Meetings Open to the Public			
Meeting Date	Meeting Type	Meeting Topic/Goal	Direction/Input
12/15/2011	Climate & Energy WG	<ul style="list-style-type: none"> Review of scenarios requested by WG at 10/5 meeting Select GHG reduction target 	<ul style="list-style-type: none"> Low attendance. Additional WG meeting necessary before goal is selected
2/16/2012	Climate & Energy WG	<ul style="list-style-type: none"> Discussion and selection of a 2020 GHG reduction goal and 2035, 2050 targets 	<ul style="list-style-type: none"> No consensus on a goal for 2020, therefore goal setting discussion will take place at EAC to make recommendation to BPC
3/6/2012	Board of Port Commissioners Meeting	<ul style="list-style-type: none"> Update on Climate Action Plan and Climate Adaptation Plan 	
3/20/2012	Environmental Advisory Committee	<ul style="list-style-type: none"> Provide input on GHG emissions reduction targets for 2020, 2035 and 2050 	<ul style="list-style-type: none"> No consensus. Further discussion at next EAC meeting on April 17, 2012
4/17/2012	Environmental Advisory Committee	<ul style="list-style-type: none"> Provide input on GHG emissions reduction targets for 2020, 2035 and 2050 	<ul style="list-style-type: none"> The following recommendations were provided by the committee: 10% below 2006 by 2020 12% below 2006 by 2025 25% below 2006 by 2035
6/12/2012	Board of Port Commissioners Meeting	<ul style="list-style-type: none"> Update on the Climate Action Plan and establish goals 	<ul style="list-style-type: none"> The following targets were provided by the BPC: 10% below 2006 by 2020 25% below 2006 by 2035
11/4/12	Board of Port Commissioners Meeting	<ul style="list-style-type: none"> Update on the Climate Action Plan and identify next steps 	<ul style="list-style-type: none"> Return with update
4/9/13	Board of Port Commissioners Meeting	<ul style="list-style-type: none"> Update on the Climate Action Plan and identify next steps 	<ul style="list-style-type: none"> Schedule a Board Workshop on Climate Action Plan for more in-depth discussion
4/16/13	Environmental Advisory Committee	<ul style="list-style-type: none"> Update on Climate Action Plan 	
5/30/13	Environmental Advisory Committee	<ul style="list-style-type: none"> Update on Climate Action Plan Review and recommend greenhouse gas reduction policies to Board 	<ul style="list-style-type: none"> Recommendations on policy text to be provided to Board on 5/31/13
5/31/13	Board of Port	<ul style="list-style-type: none"> Update on Climate Action 	<ul style="list-style-type: none"> Develop draft

Table G-1. Summary of Climate Action Plan Development Meetings Open to the Public

Meeting Date	Meeting Type	Meeting Topic/Goal	Direction/Input
	Commissioners Climate Action Plan Workshop I	Plan <ul style="list-style-type: none"> • Review and recommend greenhouse gas reduction policies • Provide feedback on next steps 	implementation plan <ul style="list-style-type: none"> • Schedule second Climate Action Plan Workshop
8/20/13	Environmental Advisory Committee	<ul style="list-style-type: none"> • Update on Climate Action Plan 	
8/28/13	Board of Port Commissioners Climate Action Plan Workshop II	<ul style="list-style-type: none"> • Overview of policies, evaluation criteria, and approach to implementation • Provide feedback on next steps 	<ul style="list-style-type: none"> • Update greenhouse gas reduction policies • Update evaluation criteria • Develop case studies to highlight implementation mechanisms • Hold meeting to receive input from the public • Schedule third Climate Action Plan Workshop
9/24/13	Environmental Advisory Committee	<ul style="list-style-type: none"> • Update on Climate Action Plan 	
9/25/13	Climate Action Plan Public Meeting	<ul style="list-style-type: none"> • Update on Climate Action Plan • Provide input on greenhouse gas reduction policies 	<ul style="list-style-type: none"> • Provide comments to Board • Update greenhouse gas reduction policy text and evaluation criteria based on feedback
11/12/13	Board of Port Commissioners Climate Action Plan Workshop III	<ul style="list-style-type: none"> • Overview of updates to greenhouse gas reduction policies, evaluation criteria, and approach to implementation • Provide feedback on next steps 	<ul style="list-style-type: none"> • Make revisions to greenhouse gas reduction policy text and evaluation criteria based on Board input • Provide update or final Climate Action Plan to Board in December
12/10/13	Board of Port Commissioners Meeting	<ul style="list-style-type: none"> • Approve final Climate Action Plan 	

Notes:

* Climate & Energy Workgroup (WG) - a sub-group of the Port's Environmental Advisory Committee (EAC)

* Environmental Advisory Committee (EAC) - Port advisory committee to the Board of Port Commissioners

N/A - not applicable as no written comments regarding the meeting were received by the Port

G.4 Summary of Public Comments

The Port's Work Group meetings, Environmental Advisory Committee meetings, and evening meetings for the general public included requests for public comments throughout the development of the Climate Action Plan. Numerous comments and questions were put forth by the Work Group, Committee, and public and were incorporated into the development of the Plan, when possible. Public comments received during the 2013 Board Workshops were documented in public Board packets prepared for the Workshop meetings and are available on the internet.²

G.5 Public Process After Adoption

If the Board of Port Commissioners adopts the Climate Action Plan, input from stakeholders and the public on implementation of the Plan will continue to be an important part of the process. Creating a plan is just the first step. Implementation of the Climate Action and Plan will require collaboration with an array of Port departments, stakeholders, regional efforts, and state and federal programs.

² http://www.portofsandiego.org/environment/clean-water/doc_download/5430-11-12-13-bpc-special-meeting-agenda-climate-plan-workshop-iii.html