

## Appendix C: Greenhouse Gas Emission Calculations

**UC Davis Respiratory Diseases Center  
Evaluation of Global Climate Change Impacts (Land Use GHG Emissions)**

**Table GHG-1  
Construction Exhaust GHG Emission Factors**

| <b>Equipment Type</b>     | <b>CO<sub>2</sub> Emission Factor<sup>1</sup><br/>(kg/gal)</b> | <b>CH<sub>4</sub> Emission Factor<sup>2,3</sup><br/>(kg/gal)</b> | <b>N<sub>2</sub>O Emission Factor<sup>2,3</sup><br/>(kg/gal)</b> | <b>CO<sub>2</sub> to CO<sub>2</sub>e Ratio<br/>(GWP CH<sub>4</sub> = 21)<br/>(GWP N<sub>2</sub>O = 310)</b> |
|---------------------------|--|--|--|---|
| Off-Road                  | 10.15  | 0.00058  | 0.00026  | 0.991   |
| On-Road                   | 10.15  | 0.000031   | 0.000029   | 0.999   |
| Vendor Autos <sup>4</sup> | 10.15<br>n/a   | 0.000031<br>n/a  | 0.000029<br>n/a  | 0.999<br>0.950  |

Sources:

1. California Climate Action Registry, *General Reporting Protocol: Reporting Entity-Wide Greenhouse Gas Emissions Version 3.1*, (2009) 96.
2. California Climate Action Registry, *General Reporting Protocol: Reporting Entity-Wide Greenhouse as Emissions Version 3.1*, (2009) 98, 100.
3. California Energy Commission, *Diesel Use in California, Remarks by Commissioner James D. Boyd*, (2002). It was assumed that heavy duty on-road trucks have a fuel economy of 6 miles per gallon based on this data source.
4. U.S. Environmental Protection Agency, *Emission Facts - Greenhouse Gas Emissions from a Typical Passenger Vehicle*, (2005) 4. It is assumed that CO<sub>2</sub> accounts for 95% of the greenhouse gas emissions, while CH<sub>4</sub>, N<sub>2</sub>O, and HFCs account for 5% of emissions.

**Table GHG-2  
Construction Exhaust GHG Emissions**

| <b>Construction Year</b>   | <b>Equipment Type</b> | <b>Annual CO<sub>2</sub> Emissions<sup>1</sup><br/>(Tons CO<sub>2</sub>/yr)</b> | <b>Annual CO<sub>2</sub> Emissions<br/>(MTCO<sub>2</sub>/yr)</b> | <b>CO<sub>2</sub> to CO<sub>2</sub>e Ratio</b> | <b>Annual CO<sub>2</sub>e Emissions<br/>(MTCO<sub>2</sub>e/yr)</b> |
|--|-----------------------|---|--|--|--|
| 2011   | Off-Road              | 144.21  | 130.83   | 0.991  | 132.02   |
| 2011   | On-Road               | 0.13  | 0.12   | 0.999  | 0.12   |
| 2011   | Vendor                | 28.94   | 26.25  | 0.999  | 26.28  |
| 2011   | Worker/Autos          | 21.67   | 19.66  | 0.950  | 20.69  |
| <b>Total 2011</b>  |                       | <b>194.95</b>   | <b>176.86</b>  |  | <b>179.11</b>  |
| <b>Total Construction Exhaust GHG Emissions Amortized over "Project Lifetime" (25 years)</b> |                       |   |  |  | <b>7.16</b>  |

Sources:

1. Estimated CO<sub>2</sub> emissions from URBEMIS2007.

Where:

|                   |                           |                  |               |
|-------------------|---------------------------|------------------|---------------|
| CH <sub>4</sub>   | Methane                   | kg               | Kilograms     |
| CO <sub>2</sub>   | Carbon dioxide            | MT               | Metric ton    |
| CO <sub>2</sub> e | Carbon dioxide equivalent | N <sub>2</sub> O | Nitrous oxide |
| gal               | Gallons                   | yr               | Year          |
| GWP               | Global warming potential  |                  |               |

**UC Davis Respiratory Diseases Center  
Evaluation of Global Climate Change Impacts (Land Use GHG Emissions)**

**Table GHG-3  
Operational Motor Vehicle GHG Emissions**

| Emissions Scenario                      | ITE Code | Units     | Base Trip Rate <sup>1</sup><br>(ADT/unit) | Annual CO <sub>2</sub> Emissions <sup>2</sup><br>(Tons CO <sub>2</sub> /yr) | AB 32 Reductions in Place <sup>3</sup><br>(%) | CO <sub>2</sub> to CO <sub>2</sub> e Ratio <sup>4</sup> | Annual CO <sub>2</sub> e Emissions (MTCO <sub>2</sub> e/yr) |          |
|---|----------|-----------|---|---|---|---|---|----------|
|   |          |           |   |   |   |   | w/o AB 32   | w/ AB 32 |
| Proposed Project General Light Industry | 110      | 20.00 ksf | 5.00                                      | 193.52  | 27.6%   | 0.95  | 184.80  | 133.85   |
| Subtotal                                |          |           |   | 193.52  |   |   | 184.80  | 133.85   |

Sources:

1. Trip generation rate provided by UC Davis (100 trips per day).
2. Estimated CO<sub>2</sub> emissions from URBEMIS2007 Environmental Management Software.
3. California Air Resources Board, Climate Change Scoping Plan, (2008). See Table GHG-2.
4. U.S. Environmental Protection Agency, *Emission Facts - Greenhouse Gas Emissions from a Typical Passenger Vehicle*, (2005) 4. It is assumed that CO<sub>2</sub> accounts for 95% of the greenhouse gas emissions, while CH<sub>4</sub>, N<sub>2</sub>O, and HFCs account for 5% of the emissions.

Where:

ADT                      Average daily trips  
CO<sub>2</sub>                      Carbon dioxide  
Carbon dioxide  
CO<sub>2</sub>e                      equivalent

**UC Davis Respiratory Diseases Center  
Evaluation of Global Climate Change Impacts (Land Use GHG Emissions)**

**Table GHG-4  
Electrical Consumption GHG Emissions**

| Emissions Scenario | Units     | Efficiency Standards <sup>1</sup> | Other <sup>2</sup> Features (%) | Cumulative Efficiency Features (%) | Electricity Consumption Factor <sup>3,4,5</sup> (kW-hr/unit/yr) | Annual Consumption Factor (MW-hr/yr) | CO <sub>2</sub> GWP = 1 (lbs/MW-hr) | CH <sub>4</sub> Emission Factor <sup>6</sup> GWP = 21 (lbs/MW-hr) | N <sub>2</sub> O Emission Factor <sup>7</sup> GWP = 310 (lbs/MW-hr) | Annual CO <sub>2</sub> e Emission Factor <sup>7</sup> (MTCO <sub>2</sub> e/yr) |
|--------------------|-----------|-----------------------------------|---------------------------------|------------------------------------|---|--------------------------------------|-------------------------------------|---|---|--|
|                    |           | Title 24 2008 (%)                 |                                 |                                    |   |                                      |                                     |   |   |  |
| Proposed Project   |           |                                   |                                 |                                    |   |                                      |                                     |   |   |  |
| Industrial         | 20,000 sf | 0.0%                              | 11.0%                           | 11.0%                              | 13.49   | 240.12                               | 721.12                              | 0.300   | 0.008   | 79.50  |
| Subtotal           |           |                                   |                                 |                                    |   | 240.12                               |                                     |   |   | 79.50  |

Sources:

- California Energy Commission, *Impact Analysis: 2008 Update to the California Energy Efficiency Standards*, (2007) 4.
- 11% of power supplied by WAPA is assumed to be produced by hydropower and have no net GHG emissions
- California Air Pollution Control Officer's Association, *CEQA and Climate Change*, (2008) 61.
- South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (1993) A9-114.
- California Climate Action Registry, *General Reporting Protocol: Reporting Entity-Wide Greenhouse Gas Emissions*, Version 3.1, (2009) 37.
- California Climate Action Registry, "Climate Action Registry Reporting Online Tool," <https://www.climateregistry.org/CARROT/public/reports.aspx>. 2010. See *2008 Annual Entity Emissions: Electric Power Generation/Electric Utility Sector*, Pacific Gas & Electric.  
The CO<sub>2</sub> factor is for Pacific Gas & Electric. The CO<sub>2</sub> factor is based on the 2008 value, the latest year for which data is available.
- The Climate Registry, *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories*, Version 1.1, (2010) 208.
- California Air Resources Board, *Climate Change Scoping Plan*, (2008).

Where:

|                 |                |       |               |
|-----------------|----------------|-------|---------------|
| CH <sub>4</sub> | Methane        | lbs   | Pounds        |
| CO <sub>2</sub> | Carbon dioxide | MW-hr | Megawatt-hour |

|                   |                           |                  |                |
|-------------------|---------------------------|------------------|----------------|
| CO <sub>2</sub> e | Carbon dioxide equivalent | MT               | Metric ton     |
| gsf               | Gross square feet         | n/a              | Not applicable |
| GWP               | Global warming potential  | N <sub>2</sub> O | Nitrous oxide  |
| kW-hr             | Kilowatt-hour             | yr               | Year           |

**UC Davis Respiratory Diseases Center  
Evaluation of Global Climate Change Impacts (Land Use GHG Emissions)**

**Table GHG-5  
Solid Waste GHG Emissions**

| <b>Emissions Scenario</b> | <b>Units</b> | <b>Solid Waste Generation<sup>1</sup><br/>(MT/yr)</b> | <b>CO<sub>2</sub>e Emission Factor<sup>2</sup><br/>(MT CO<sub>2</sub>e/MT waste)</b> | <b>Annual CO<sub>2</sub>e Emissions<br/>(MT CO<sub>2</sub>e/yr)</b> |
|---------------------------|--------------|---|--|---|
| Proposed Project          |              |   |  |   |
| Industrial                | 25 emp       | 172.37  | 0.37   | 63.78   |
| Subtotal                  |              | 172.37  |  | 63.78   |

Sources:

- California Integrated Waste Management Board, "Estimated Solid Waste General Rates for Institutions," <http://www.calrecycle.ca.gov/wastechar/wastegenrates/Institution.htm>. 2009. The rate is 7.6 tons per employee per year for light industrial. Value is converted to metric tons.
- U.S. Environmental Protection Agency, *Solid Waste Management and Greenhouse Gases: A Lifecycle Assessment of Emissions and Sinks* (2006) 93. The net CO<sub>2</sub>e emission factors are based on mixed municipal solid waste (MSW) as disposed in landfills without landfill gas recovery.

Where:

CO<sub>2</sub>e                      Carbon dioxide equivalent

gsf                      Gross square  
feet  
MT                        Metric ton  
yr                         Year

**UC Davis Respiratory Diseases Center  
Evaluation of Global Climate Change Impacts (Land Use GHG Emissions)**

**Table GHG-6  
Potable Water Supply, Conveyance, Treatment, and Distribution GHG Emissions**

| <b>Emissions Scenario</b>            | <b>Water Saving Features<sup>1</sup> (%)</b> | <b>Potable Water Estimate<sup>2</sup> (MG/yr)</b> | <b>Electrical Consumption Factor<sup>3,4,5</sup> (kW-hr/MG)</b> | <b>Annual Electrical Consumption (MW-hr/yr)</b> | <b>CO<sub>2</sub> Emission Factor<sup>6</sup> GWP = 1 (lbs/MW-hr)</b> | <b>CH<sub>4</sub> Emission Factor<sup>7</sup> GWP = 21 (lbs/MW-hr)</b> | <b>N<sub>2</sub>O Emission Factor<sup>7</sup> GWP = 310 (lbs/MW-hr)</b> | <b>Annual CO<sub>2</sub>e Emissions (MTCO<sub>2</sub>e/yr)</b> |
|--------------------------------------|--|---|---|---|---|--|---|--|
| Proposed Project Supply & Conveyance | 0%   | 1.71  | 2,117   | 3.62  | 721.12  | 0.029  | 0.011   | 1.19   |
| Treatment                            | 0%   | 1.71  | 111   | 0.19  | 721.12  | 0.029  | 0.011   | 0.06   |
| Distribution                         | 0%   | 1.71  | 1,272   | 2.17  | 721.12  | 0.029  | 0.011   | 0.71   |
| Recycled Water                       | 0%   | 1.71  | 875   | 1.49  | 721.12  | 0.029  | 0.011   | 0.49   |
| Subtotal                             |  |   |   |   |   |  |   | 2.46   |

Sources:

1. No specific project features were accounted for.
2. Assumes potable water demand is equal to 125% of estimated wastewater generation.
3. California Energy Commission, *California's Water-Energy Relationship, Final Staff Report*, CEC-700-2005-011-SF, (2005) 11.

4. California Energy Commission, *Refining Estimates of Water-Related Energy Use in California, PIER Final Project Report*, CEC-500-2006-118, (2006) 22.
5. R. C. Wilkinson, et. al, California Department of Water Resources, *Water Sources "Powering" Southern California*, n.d. Recycled water is estimated to use 285 kW-hr per acre-foot (West Basin Municipal Water District).
6. California Climate Action Registry, "Climate Action Registry Reporting Online Tool," <https://www.climateregistry.org/CARROT/public/reports.aspx>. 2010. See *2008 Annual Entity Emissions: Electric Power Generation/Electric Utility Sector, Pacific Gas & Electric*.
7. The Climate Registry, *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories*, Version 1.1, (2010) 208.

Where:

|                   |                           |                  |                 |
|-------------------|---------------------------|------------------|-----------------|
| CH <sub>4</sub>   | Methane                   | MG               | Million gallons |
| CO <sub>2</sub>   | Carbon dioxide            | MW-hr            | Megawatt-hour   |
| CO <sub>2</sub> e | Carbon dioxide equivalent | MT               | Metric ton      |
| GWP               | Global warming potential  | n/a              | Not applicable  |
| kW-hr             | Kilowatt-hour             | N <sub>2</sub> O | Nitrous oxide   |
| lbs               | Pounds                    | yr               | Year            |



**UC Davis Respiratory Diseases Center  
Evaluation of Global Climate Change Impacts (Land Use GHG Emissions)**

**Table GHG-7  
Wastewater Treatment Electrical Demand GHG Emissions**

| <b>Emissions Scenario</b> | <b>Net Wastewater Generation Rate<sup>1</sup><br/>(MG/yr)</b> | <b>Electrical Demand Factor<sup>2,3</sup><br/>(kW-hr/MG)</b> | <b>Annual Demand Factor<br/>(MW-hr/yr)</b> | <b>CO<sub>2</sub> Emission Factor<sup>4</sup><br/>GWP = 1<br/>(lbs/MW-hr)</b> | <b>CH<sub>4</sub> Emission Factor<sup>5</sup><br/>GWP = 21<br/>(lbs/MW-hr)</b> | <b>N<sub>2</sub>O Emission Factor<sup>5</sup><br/>GWP = 310<br/>(lbs/MW-hr)</b> | <b>Annual CO<sub>2</sub>e Emissions<br/>(MT CO<sub>2</sub>e/yr)</b> |
|---------------------------|---|--|--|---|--|---|---|
| Proposed Project          |   |  |  |   |  |   |   |
| Industrial                | 1.37  | 2,500  | 3.42                                       | 641.35  | 0.029  | 0.011   | 1.00  |
| Subtotal                  | 1.37  |  |  |   |  |   | 1.00  |

**Sources:**

1. UC Davis, *Respiratory Diseases Center, Tiered Initial Study*, (2010).
2. California Energy Commission, *California's Water-Energy Relationship, Final Staff Report*, CEC-700-2005-011-SF, (2005) 11.
3. California Energy Commission, *Refining Estimates of Water-Related Energy Use in California, PIER Final Project Report (CEC-500-2006-118)*. Prepared by Navigant Consulting, Inc., (2006) 22.
4. California Climate Action Registry, "Climate Action Registry Reporting Online Tool," <https://www.climateregistry.org/CARROT/public/reports.aspx>. 2010. See *2008 Annual Entity Emissions: Electric Power Generation/Electric Utility Sector, Pacific Gas & Electric*.
5. The Climate Registry, *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories*, Version 1.1, (2010) 208.

**UC Davis Respiratory Diseases Center  
Stationary Source Emissions  
Natural Gas Boilers**

Boiler Data

Nominal Rating per Boiler: 1.5 MMBtu/hr  
 Number of New Boilers: 1  
 Operational hours: 24 hr/day  
 8,760 hr/yr  
 Capacity Factor: 75%  
 Standard Temp 60 deg F  
 Molar Volume 379.70 scf/mole  
 Heat Content of Natural Gas 1,020 Btu/scf

**Table STA-1  
Natural Gas Boiler Emissions**

| Units                   | Criteria Pollutants |                 |        |                 |        |        | Greenhouse Gases |                 |                  |                   |
|-------------------------|---------------------|-----------------|--------|-----------------|--------|--------|------------------|-----------------|------------------|-------------------|
|                         | ROG                 | NO <sub>x</sub> | CO     | SO <sub>x</sub> | PM10   | PM2.5  | CO <sub>2</sub>  | CH <sub>4</sub> | N <sub>2</sub> O | CO <sub>2</sub> e |
| ppm @ 3% O <sub>2</sub> |                     | 30.00           |        |                 |        |        |                  |                 |                  |                   |
| lbs/MMBtu               | 0.0054              | 0.0360          | 0.0824 | 0.0006          | 0.0075 | 0.0075 | 116.98           | 0.0110          | 0.0002           | 117.28            |
| lbs/hr                  | 0.01                | 0.04            | 0.09   | 0.00            | 0.01   | 0.01   | 131.60           | 0.01            | 0.00             | 131.94            |
| lbs/day                 | 0.11                | 0.73            | 1.67   | 0.01            | 0.15   | 0.15   | 2,368.79         | 0.22            | 0.00             | 4,906.07          |
| lbs/yr                  | 39.85               | 266.09          | 608.69 | 4.35            | 55.07  | 55.07  | 864,608.24       | 81.47           | 1.63             | 866,824.34        |
| tons/yr                 | 0.02                | 0.13            | 0.30   | 0.00            | 0.03   | 0.03   | 432.30           | 0.04            | 0.00             | 433.41            |
| metric tons/yr          |                     |                 |        |                 |        |        | 392.18           | 0.04            | 0.00             | 393.19            |

Notes:

- 1 Emission factors for ROG, CO, PM10, and SO<sub>x</sub>: U.S. Environmental Protection Agency, *AP-42 Compilation of Air Pollutant Emission Factors*, Chapter 1.4, Table 1.4-1 and 1.4-2.
- 2 Emission factor for NO<sub>x</sub> assumes compliance with 30 ppm standard.
- 3 Emission factor for PM2.5 assumes all PM is less than 1 micron in diameter.
- 4 Emission factors for CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O: California Climate Action Registry, *General Reporting Protocol*, Version 3.1, (2009) 101, 103.
- 5 Emissions of CO<sub>2</sub>e assumes the following global warming potentials: CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310.

**UC Davis Respiratory Diseases Center  
Stationary Source Emissions  
Emergency Generator**

Generator Data

|                              |      |        |
|------------------------------|------|--------|
| Nominal Rating of Generator: | 600  | kW     |
| Number of New Generators:    | 1    |        |
| Engine size                  | 805  | hp     |
| Operational hours:           | 1    | hr/day |
|                              | 50   | hr/yr  |
| Capacity Factor:             | 100% |        |
| MMBtu/yr                     | 102  |        |

**Table STA-2  
Emergency Generator Emissions**

| Units     | Criteria Pollutants |                 |          |                 |          |          | Greenhouse Gases |                 |                  |                   |
|-----------|---------------------|-----------------|----------|-----------------|----------|----------|------------------|-----------------|------------------|-------------------|
|           | ROG                 | NO <sub>x</sub> | CO       | SO <sub>x</sub> | PM10     | PM2.5    | CO <sub>2</sub>  | CH <sub>4</sub> | N <sub>2</sub> O | CO <sub>2</sub> e |
| lbs/hp-hr | 2.47E-03            | 3.10E-02        | 6.68E-03 | 1.21E-05        | 2.20E-03 | 2.20E-03 |                  |                 |                  |                   |
| lbs/hr    | 1.99                | 24.96           | 5.38     | 0.01            | 1.77     | 1.77     |                  |                 |                  |                   |
| lbs/day   | 1.99                | 24.96           | 5.38     | 0.01            | 1.77     | 1.77     |                  |                 |                  |                   |
| lbs/yr    | 99.42               | 1,247.75        | 268.87   | 0.49            | 88.55    | 88.55    |                  |                 |                  |                   |

|                |      |      |      |      |      |      |       |          |          |       |
|----------------|------|------|------|------|------|------|-------|----------|----------|-------|
| tons/yr        | 0.05 | 0.62 | 0.13 | 0.00 | 0.04 | 0.04 |       |          |          |       |
| kg/MMBtu       |      |      |      |      |      |      | 19.95 | 1.10E-02 | 6.00E-04 | 20.37 |
| metric tons/yr |      |      |      |      |      |      | 2.04  | 1.13E-03 | 6.14E-05 | 2.08  |

Notes:

1. Emission factors for ROG, NO<sub>x</sub>, CO, PM10, and SO<sub>x</sub>: U.S. Environmental Protection Agency, *AP-42 Compilation of Air Pollutant Emission Factors*, Chapter 3.3, Table 3.3-1. Emission Factor for SO<sub>x</sub> is based on 15 ppm (0.0015%).
2. Emission factors for SO<sub>x</sub>: U.S. Environmental Protection Agency, *AP-42 Compilation of Air Pollutant Emission Factors*, Chapter 3.4, Table 3.4-1. Emission Factor for SO<sub>x</sub> is based on 15 ppm (0.0015%).
3. Emission factor for PM2.5 assumes all PM is less than 1 micron in diameter.
4. Emission factors for CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O: California Climate Action Registry, *General Reporting Protocol*, Version 3.1, (2009) 101, 103.
5. Emissions of CO<sub>2</sub>e assumes the following global warming potentials: CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310.

## *Additional Regulatory Background*

### *Assembly Bill 1493*

In response to the transportation sector's contribution of more than half of California's CO<sub>2</sub> emissions, Assembly Bill 1493 (AB 1493, Pavley) was enacted on July 22, 2002. AB 1493 requires CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles whose primary use is noncommercial personal transportation. CARB adopted the standards in September 2004. The new standards will be phased in during the 2009–2016 model years. When fully phased in, the near term (2009–2012) standards will result in a reduction of about 22 percent in GHG emissions compared to the emissions from the 2002 fleet, while the midterm (2013–2016) standards will result in a reduction of about 30 percent.

Before these regulations may go into effect, the U.S. EPA must grant California a waiver under the federal CAA, which ordinarily preempts state regulation of motor vehicle emission standards. On June 30, 2009, the U.S. EPA formally approved California's waiver request. However, in light of the September 15, 2009, announcement by the U.S. EPA and NHTSA regarding the national program to reduce vehicle GHG emissions, California—and states adopting California emissions standards—have agreed to defer to the proposed national standard through model year 2016 if granted a waiver by the U.S. EPA. The 2016 endpoint of the two standards is similar, although the national standard ramps up slightly more slowly than required under the California standard. The Pavley standards require additional reductions in CO<sub>2</sub> emissions beyond 2016 (referred to as Phase II standards). While the Phase II standards have yet to be fully developed, CARB's has made it clear that the state intends to pursue additional reductions from motor vehicles in the 2017 through 2020 timeframe under the California Global Warming Solutions Act of 2006.

### *Executive Order S-1-07 (Low Carbon Fuel Standard)*

On January 18, 2007, California further solidified its dedication to reducing GHGs by setting a new Low Carbon Fuel Standard (LCFS) for transportation fuels sold within the state. Executive Order S-1-07 sets a declining standard for GHG emissions measured in CO<sub>2</sub>-equivalent gram per unit of fuel energy sold in California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels by at least 10 percent by 2020. The LCFS will apply to refiners, blenders, producers, and importers of transportation fuels and will use market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods. The executive order requires the Secretary of Cal/EPA to coordinate with the CEC, CARB, the University of California, and other agencies to develop a protocol to measure the "life-cycle carbon intensity" of transportation

fuels. CARB released a draft version of the LCFS in October 2008 and adopted the final regulation on April 23, 2009.

### ***California Climate Action Registry***

The California Climate Action Registry (CCAR) is a private non-profit organization formed by the State of California that serves as a voluntary GHG registry to protect and promote early actions to reduce GHG emissions by organizations. Senate Bill 1771 (SB 1771, Sher) formally established the CCAR with technical changes made to the statute in SB 527, which finalized the structure of the CCAR. The CCAR began with 23 charter members and currently has over 300 corporations, universities, cities and counties, government agencies and environment organizations voluntarily measuring, monitoring, and publicly reporting their GHG emissions using the CCAR protocols. The CCAR has published a General Reporting Protocol, as well as project- and industry-specific protocols for landfill activities, livestock activities, the cement sector, the power/utility sector, and the forest sector. The protocols provide the principles, approach, methodology, and procedures required for participation in the CCAR.

Due to the growth of the CCAR, it now operates under the Climate Action Reserve,<sup>1</sup> which is a national offsets program for the United States carbon market. As part of this transition, the California Climate Action Registry was instrumental in establishing The Climate Registry, with the mission of expanding the California Registry's emissions reporting work to include all of North America.<sup>2</sup> Emissions inventory reporting is being transitioned to The Climate Registry, and reports for the 2009 reporting year will be the last the California Registry will accept. However, even after that year, the California Registry will continue to represent its members' emissions reports to the state of California.

### ***CAPCOA CEQA and Climate Change White Paper***

The California Air Pollution Control Officers Association (CAPCOA) prepared a white paper on CEQA and Climate Change in January 2008. The white paper contains a disclaimer that states the paper is intended to be used as a resource by lead agencies when considering policy options and not as a guidance document. The disclaimer also states that it "is not intended, and should not be interpreted, to dictate the manner in which an air district or lead agency chooses to address GHG emissions in the context of its review of projects under CEQA" (CAPCOA 2008). Specifically, the white paper discusses three possible approaches to evaluating the significance of GHG emissions and possible mitigation measures; however,

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<sup>1</sup> Additional information about the Climate Action Reserve may be obtained at the following Web site: <http://www.climateactionreserve.org/>.

<sup>2</sup> Additional information about The Climate Registry may be obtained at the following Web site: <http://www.theclimateregistry.org/>.

CAPCOA does not endorse any particular approach. The three alternative significance approaches are (1) not establishing a significance threshold for GHG emissions, (2) setting the GHG emission threshold at zero, and (3) setting the GHG emission threshold at some non-zero level. The white paper evaluates potential considerations and pitfalls associated with the three approaches. At the end of the white paper, CAPCOA provides a list of potential mitigation measures and discusses each in terms of emissions reduction effectiveness, cost effectiveness, and technical and logistical feasibility.

### ***CARB Proposal for Significance Thresholds for GHGs under CEQA***

On October 24, 2008, CARB staff released a draft and preliminary proposal for determining whether the emissions related to proposed new projects are significant impacts under CEQA. While the proposal is focused on helping lead agencies determine under which conditions a project may be found exempt from the preparation of an EIR, the proposal also provides a guide for establishing significance thresholds for projects for which EIRs would be prepared regardless of the project's climate change impact. According to this proposal, the threshold for determining whether a project's emissions are significant is not zero emissions, but must be a stringent performance-based threshold to meet the requirements of AB 32. If the project meets certain specific yet to be developed performance standards for several categories of emissions, including construction emissions, building energy use, water use, solid waste, and transportation, and the project emits no more than a certain to be determined amount of metric tons of carbon equivalents per year, the project's impact would not be significant. According to CARB, California Energy Commission Tier II building energy use standards are proposed to be used, which generally require a reduction in energy usage of 30 percent beyond Title 24 building code requirements. CARB has also proposed a 7,000 metric ton carbon dioxide equivalent (MTCO<sub>2</sub>e) threshold for industrial projects, but has not yet proposed thresholds for residential and commercial projects. The annual threshold does not explicitly include emissions associated with construction- and transportation-related activities. The draft proposal was very controversial and CARB Staff no longer has any plans to move forward with any final threshold. A key preliminary conclusion from the draft threshold, however, was that CARB staff, in setting a numerical threshold for industrial projects and suggesting performance standards, does not believe in 'zero threshold' mandated by CEQA.