

# Greenhouse Gas Mitigation and CEQA

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*A Review of Mitigation Strategies for Projects Subject to the California Environmental Quality Act*

Prepared by

Santa Barbara County Air Pollution Control District

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## Disclaimer

The Santa Barbara County Air Pollution Control District (District) prepared this white paper to provide information and tools to support lead agencies under the California Environmental Air Quality Act (CEQA) in their determination of the appropriate amount and type of mitigation for impacts from greenhouse gas emissions, which contribute to global climate change. This paper is intended as a resource and provides information about a variety of GHG mitigation tools, strategies, registries, and example project scenarios. It is not intended, and should not be interpreted, to dictate the GHG mitigation requirements for specific projects, air districts, or CEQA lead agencies. This paper is not intended to provide legal advice and should not be construed as such. Questions of legal interpretation, particularly in the context of CEQA and other laws, should be directed to the agency's legal counsel.

### ***What is the purpose of this paper?***

This paper was prepared to offer ideas and guidance on how to mitigate impacts of greenhouse gas (GHG) emissions under the California Environmental Quality Act (CEQA). With this information, it is our hope that project proponents and CEQA lead agencies can design GHG mitigation strategies to fit project needs and also maximize the potential co-benefits that GHG mitigation offers to the local community.

This paper is not intended to dictate precisely how mitigation should occur for every project that is subject to CEQA review and mitigation. The information provided here allows for some flexibility in mitigation approaches, and introduces opportunities for local co-benefits. Although Santa Barbara County and other regions within California and the U.S. are doing a great deal in reducing GHG emissions, there are still opportunities for local GHG reduction projects. As with other mitigation strategies, it is best to plan for mitigation up-front, and to incorporate design features that maximize efficiency and make economic sense. This way, project proponents can realize cost savings, incorporate mitigation costs into the project budget, achieve co-benefits in public perception/marketing, air quality, public health, and address other GHG reduction goals related to the energy, transportation, water, and waste sectors.

This paper is primarily designed to address mitigation for stationary sources of GHGs (primarily stationary combustion devices); however, some of the concepts also apply to mitigation strategies for other project types.

### ***What factors should be considered when developing a GHG mitigation approach?***

If the GHG emissions from a project exceed a threshold, then mitigation would be required in order to bring the emissions below the threshold. Mitigation may take the form of purchased Cap-and-Trade allowances/credits, if the facility is a part of Cap-and-Trade, or GHG offsets obtained through another entity. Mitigation may also involve other actions conducted or funded by the project proponent, or incorporate adherence to a set of performance standards that apply to specific types of projects or

industries. These other actions would be evaluated by the lead agency on a case-by-case basis. Each of these are discussed below.

❖ **Mitigation Location**

GHG emissions can cause worldwide impacts. GHG emissions are different from criteria pollutants or toxic emissions; their potential effects extend well beyond an air basin’s boundaries. Emissions of GHGs in one location can produce effects on the other side of the globe. Therefore, mitigation on the other side of the globe can have the same reduction in impacts as local mitigation. However, local GHG mitigation strategies can provide local co-benefits as discussed below.

- GHG reduction projects can improve local air quality. Many air districts in California struggle with achieving state and federal attainment of ozone (related to NOx and VOC emissions) and particulate matter standards. Many GHG mitigation strategies also reduce emissions of ozone precursors and/or particulate matter.
- Emissions of toxic materials, such as diesel particulate matter, can be reduced by diesel equipment replacement strategies associated with GHG reduction measures, thereby producing co-benefits to local communities for both GHGs and toxic risks.

Local GHG mitigation measures can thus improve the health of the communities with the proposed GHG-emitting projects.

There are additional local co-benefits that are harder to quantify. Investments in GHG mitigation projects can:

- Offer local employment opportunities and generally contribute to the local economy;
- Benefit other impact/resource areas such as energy and water usage, waste and wastewater generation;
- Generate long-term benefits such as reduced traffic congestion associated with transportation improvement projects that produce GHG reductions;
- Demonstrate a leadership role to the community and contribute to regional GHG reduction efforts, through implementation of tangible and visible local projects,

CEQA (15130) indicates that a project’s contribution is less than cumulatively considerable if the project is required to implement or fund its "fair share" of a mitigation measure or measures designed to alleviate the cumulative impact. Fair share-type projects are numerous throughout the State, including transportation-related efforts funded by a range of different projects, as well as the CARB GHG Reduction Plan program, funded by proceeds from the Cap-and-Trade allowance actions. The CEQA Guidelines also state (in Section 15041), that a lead agency has authority to require feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant effects on the environment, consistent with applicable constitutional requirements such as the “nexus” and “rough proportionality” standards established by case law.

The same co-benefits can be experienced regionally, if GHG mitigation strategies are applied in other cities or areas that are located within the same air basin as the proposed GHG-emitting project.

In general, a lead agency may prefer local projects for GHG mitigation, with their co-benefits. The preferred approach is to implement GHG reduction strategies locally, followed by regionally, state-

wide and then nationally in order to realize the co-benefits of GHG reductions and health benefits of strategies implemented in the areas where the GHG-emitting projects are proposed.

❖ **Mitigation Timing**

Implementing strategies in the near-term rather than long term, or purchasing or implementing strategies "up-front," produces significant climate protection benefits. IPCC (Intergovernmental Panel on Climate Change) studies on the effects of GHG emissions indicate that "Climate change has the characteristics of a collective action problem at the global scale, because most GHGs accumulate over time" and "Substantial cuts in greenhouse gas emissions over the next few decades can substantially reduce risks of climate change by limiting warming in the second half of the 21st century and beyond" as well as "Delays in additional mitigation or constraints on technological options increase the longer-term mitigation costs to hold climate change risks at a given level".

As emissions of GHG have a lag effect, it is beneficial to implement GHG strategies in as rapid a fashion as feasible. If, for example, a project needs 20,000 MTCO<sub>2</sub>e per year for 20 years, it would actually be more beneficial to GHG impacts to purchase 400,000 MTCO<sub>2</sub>e in year one than purchase 20,000 MTCO<sub>2</sub>e annually for 20 years.

In addition, mitigation strategies need to include the re-occurring nature of many offsets. For example, some offsets, like photovoltaic panels or residential energy efficiency projects, actually produce GHG emissions reductions (and therefore potentially credits) each year after they are purchased/installed, for a timeframe of perhaps 25-30 years. GHG reductions over the project and credit lifetime should be addressed in a manner that allows clear, up-front agreements, in order to maximize the near term benefits, and encourage facilities to purchase their credit requirements in an up-front manner.

For a project that has a relatively predictable source of GHG emissions, such as combustion of produced gases or steam generation, implementing a GHG reduction strategy in the first year to cover, say, the next 5-10 years of GHG emissions, would provide for advantageous climate change effects over the scenario of implementation of the GHG strategies each year.

***What are the different options for mitigating a project's GHG emissions?***

Implementation of GHG mitigation can take the form of reducing emissions onsite or nearby, contributing to local funds or programs, participating in local, regional or statewide programs, adhering to performance standards, or obtaining GHG credits through a registry system. Each of these is discussed below.

❖ **Onsite Mitigation Programs**

Onsite efficiencies can be utilized to reduce GHG emissions, thereby reducing the amount of GHG emissions that might be subject to CEQA mitigation requirements. Onsite programs would be implemented by the facility at the facility site. Measures could include replacing inefficient pumps with newer, more efficient models; the use of higher efficiency heaters, steam generators and boilers; changes to production methods to reduce energy use; water use reduction measures to reduce the GHG related to water pumping and processing; waste reduction to reduce the energy associated with waste handling and processing; co-generation to more efficiently utilize waste

gasses in situations where a facility requires both electricity and heat; replacement of engines with electric motors to take advantage of the cleaner electricity from the grid or onsite generation of electricity or heat from renewable resources.

❖ **Local and Regional Mitigation Programs**

Some air districts have set up local programs that allow entities to supply funds with which GHG strategies can be implemented. Most of these programs are starting to phase in with the CAPCOA GHG Rx registry program (see below), but they still provide good opportunities for local projects with co-benefits, or for air districts to develop these programs to ensure the co-benefit advantages. These local programs provide the greatest potential for local co-benefits from GHG reduction projects, while providing simplified methods for GHG projects to obtain credits associated with CEQA mitigation. They also allow the districts to implement programs such as building efficiency retrofits that might not have established protocols, but still provide GHG reductions.

The SCAQMD adopted Rule XXVII in 2009 establishing a SoCal Climate Solutions Exchange. The Exchange is currently still active and has been implementing primarily forestry projects following the forestry protocols, planting over 500,000 trees in the Station Fire area to help offset GHG emissions from a Chevron project. It has also been implementing the urban forestry protocol in over 30 Cities throughout Los Angeles County (SCAQMD 2015).

Placer County APCD (PCAPCD) is issuing GHG credits for purchase from the PCAPCD's verified GHG emission reducing project related to forestry biomass management programs, and are in the draft stages of a biomass related protocol development. PCAPCD also has a Clean Air Grants program that allows for application of funds for the installation of alternative fuel stations, alternative transit systems and energy conservation projects, all of which would allow for reductions in GHG.

San Luis Obispo has begun establishing an Energy Retrofit Program whereby residential homes could be retrofitted with various energy saving devices, including attic insulation, upgrades to HVAC systems or window replacement. These retrofits would involve energy savings, which would translate into GHG reductions. Estimated reductions for the program could be as high as 4.6 MTCO<sub>2</sub>e annually per home (SLOC 2011), which could translate into 100 MTCO<sub>2</sub>e over the life of the offset project per home (25-30 years for each home). The SLOCAPCD recently, in late 2014, accepted proposals for consultants to assist in the development and implementation of the GHG reduction program for residential energy retrofit projects. Note that no protocols currently address building energy retrofit programs.

The Bay Area Air Quality Management District has issued grants for energy efficiency, cool roof and renewable energy projects.

As part of the UCSB Bren School of Environmental Science & Management's master's curriculum, a group project was conducted to investigate the feasibility of greenhouse gas mitigation in Santa Barbara County (Brotman, Brown, and Squiers, 2015). Information about this project will be made available at the project website at [www2.bren.ucsb.edu/~sbcoffsets/](http://www2.bren.ucsb.edu/~sbcoffsets/).

Many local and regional agencies are considering or have adopted Climate Action Plans, or other plans, that analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level. As laid out in CEQA Guidelines Section 15064.4 (h)(3) and 15183.5, a project that complies with a greenhouse gas reduction plan may then be considered as "mitigated" for GHGs as long as the project decision incorporates the plan requirements as mitigation measures.

The CEQA Guidelines sections referenced above set forth specific requirements for this type of determination.

❖ **Best Practices and Performance-based Standards**

Some air districts (such as San Joaquin Valley APCD, or SJVAPCD) have allowed for the use of best performance standards to satisfy the requirements for a reduction in GHG emissions over the business-as-usual scenario. Best performance standards define, for specific equipment categories (boilers, process heaters, steam generators, etc.) or development projects, a set of design features that increase efficiency and thereby reduce GHG emissions.

For example, the SJVAPCD best performance standard for process heaters places the following requirements that, when combined, are estimated to increase efficiency by 9.5% over a baseline case:

- They must be fired with natural gas,
- Forced-draft design, with stack heater recovery systems to limit the temperature differential between the stack exhaust temperature and the heated fluid to 150 °F,
- Oxygen (O<sub>2</sub>) trim control system;
- Combustion air blower powered by a variable-drive, premium efficiency motor.

For development projects, best performance standards could include energy conservation through building designs that increase energy efficiency, thereby exceeding Title 24 requirements; water conservation; or, the use of energy efficient appliances.

Generally, these design features would need to be above and beyond the original proposal included in the project application materials, and not be required as part of existing code or design requirements, in order to be considered acceptable for CEQA mitigation.

CEQA (15064.4) indicates that the determination of the significance of greenhouse gas emissions can rely on a qualitative analysis or performance based standards.

❖ **State of California Programs**

The California Air Resource Board has implemented a Cap-and-Trade program, as per the AB-32 directed Scoping Plan, applicable to specific industries that emit more than 25,000 MTCO<sub>2</sub>e annually. The AB 32 Scoping Plan identifies a Cap-and-Trade program as one of the strategies California would employ to reduce GHG emissions that cause climate change. Under Cap-and-Trade, an overall limit on GHG emissions from capped sectors is established, and facilities subject to the cap are able to trade permits (allowances) to emit GHGs. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions from stationary sources. The petroleum and natural gas systems sector is covered starting in 2013 for stationary and related combustion, process vents and flare emissions if the total emissions from these sources exceed 25,000 MTCO<sub>2</sub>e per year. Suppliers of natural gas and transportation fuels are covered beginning in 2015 for combustion emissions from the total volume of natural gas delivered to a non-covered entity, or for transportation fuels.

Cap-and-Trade is designed to reduce the emissions from a substantial percentage of GHG sources (approximately 80 percent of GHG emissions would come under the program) within California through a market trading system. The system reduces GHG emissions by reducing the available GHG

“allowances” over time up until the year 2020. The program, beyond the year 2020, has not been designed yet, but the program is intended to extend beyond that timeframe.

Facilities are required to obtain an “allowance”, either through purchasing on auction or through freely allocated “industry assistance” allowances from CARB, for each MTCO<sub>2</sub>e of GHG they emit.

CARB issues the “industry assistance” allocations for free for a number of industries. These are based, in part, on a pre-defined “benchmark” of GHG emissions per unit of production, or, in effect, the efficiency and GHG intensity of the industry process (i.e., GHG per barrel of crude oil produced). The more inefficient the process, the more purchased allowances the facility is required to obtain. Purchased offsets are also available for offsets complying with CARB approved protocols (see below).

### ❖ **GHG Protocols and Registries**

GHG credits are available through the Cap-and-Trade program as well as registries that are open to entities purchasing credits for other reasons. Obtaining credits for GHG reduction generally requires that the credits be issued as prescribed in an approved protocol. Protocols and registries are discussed below.

#### **GHG Reduction Protocols**

Protocols provide a mechanism to ensure that GHG reductions meet the following criteria:

- Real* – represent reductions actually achieved (not based on maximum permit levels),
- Additional/Surplus* – not already planned or required (i.e., not double-counted),
- Quantifiable* – readily accounted for through process information or other reliable data,
- Enforceable* – acquired through legally binding commitments/agreements,
- Validated* – verified through accurate means by a reliable third party, and
- Permanent* –will remain as GHG reductions in perpetuity.

In combination with protocols, verification by a certified verifier are usually required to ensure that the GHG credit is actually following the protocols. Cap-and-Trade, for example, requires that all GHG sources be verified and that all credits issued under the Cap-and-Trade program also be verified. Protocols allow for an air district to specify what type of GHG projects are acceptable for GHG mitigation in advance of a facility’s purchase of credits. Clear communication about what protocols are acceptable in advance will facilitate fulfillment of CEQA mitigation requirements.

Some protocols currently available include the following:

***Biomass to energy (GHG Rx)*** - This protocol is for projects which process and transport biomass waste for the generation of energy (e.g. electricity and process heat). The protocol is limited to projects where, at the start of the project, the biomass waste would have otherwise been legally disposed of through: (1) open burning; (2) decay and decomposition in the field; or (3) landfill.

***Boiler Efficiency (GHG Rx)*** - The purpose of this protocol is to establish a method to quantify voluntary reductions in greenhouse gas (GHG) emissions resulting from an improvement in the efficiency of a boiler or process heater. This protocol is being phased out in the SCAQMD



(SCAQMD 2015) for boilers that use purchased natural gas, which is covered by the Cap-and-Trade rule.

**Forestry (CARB, GHG Rx, CAR, ACR)** - The Compliance Offset Protocol U.S. Forest Projects (Forest Offset Protocol) provides requirements and methods for quantifying the net climate benefits of activities that sequester carbon on forestland. The protocol provides offset project eligibility rules; methods to calculate an offset project's net effects on greenhouse gas (GHG) emissions and removals of CO<sub>2</sub> from the atmosphere (removals); procedures for assessing the risk that carbon sequestered by a project may be reversed (i.e. released back to the atmosphere); and approaches for long term project monitoring and reporting. There are multiple protocols for forestry management, including the CAPCOA "100-year Improved Forest Management Methodology for Quantifying GHG", the CARB "Compliance Offset Protocol U.S. Forest Projects", the Climate Action Reserve (CAR) "Forest Project Protocol" and the CARB "Urban Forest Protocol".

**Organic Waste (GHG Rx, CAR, ACR)** - The Climate Action Reserve (Reserve) Organic Waste Digestion (OWD) Project Protocol provides guidance to account for, report, and verify greenhouse gas (GHG) emission reductions associated with the diversion of organic waste and/or wastewater away from anaerobic treatment and disposal systems and to a biogas control system.

**Livestock Manure (CARB, GHG Rx, CAR, ACR)** - Livestock manure protocols address livestock manure, a significant source of methane that can be captured and used for heat and/or energy, thereby reducing GHG emissions.

**Ozone Depleting Substances (CARB, CAR)** - The Compliance Offset Protocol Ozone Depleting Substances Projects provides methods to quantify and report greenhouse gas (GHG) emission reductions associated with the destruction of high global warming potential ozone depleting substances (ODS) sourced from and destroyed within the U.S. that would have otherwise been released to the atmosphere.

**Mine Methane Capture (CARB, CAR)** - The purpose of the Compliance Offset Protocol Mine Methane Capture Projects (protocol) is to quantify greenhouse gas emission reductions associated with the capture and destruction of methane that would otherwise be vented into the atmosphere as a result of mining operations at active underground and surface coal and trona mines and abandoned underground coal mines.

**Compost Additions to Grazed Grasslands (GHG Rx, CAR, ACR)** – This relatively new protocol involves sustainable land management practices that help store atmospheric carbon in the soil through a process of applying compost to rangelands. The practice helps reduce atmospheric greenhouse gases through enhanced photosynthetic capture of carbon dioxide from the air, generates tradable offset credits for ranchers and enhances the productivity and water holding capacity of rangelands.

**Other American Carbon Registry Protocols** - The California Air Resources Board (ARB) has approved the American Carbon Registry (ACR) as an Offset Project Registry (OPR) for the California Cap-and-Trade Program. The ACR has a large number of other protocols currently in place that a CEQA lead agency may consider allowing, including energy generation and demand, transportation, fugitive emissions, waste handling and agricultural management (fertilizer management, rice management, grasslands, wetlands, grazing lands, etc.).

**Other Climate Action Reserve Protocols** - The Climate Action Reserve has a number of additional protocols established, including nitric acid production, nitrogen management, and U.S. landfill protocols.

Additional protocols are being developed, such as the Placer County APCD protocol on Biochar (transforming the carbon in raw biomass into a more recalcitrant form, which can be applied to soil for long-term sequestration). CAPCOA has protocol requirements for developing new protocols. As more protocols are adopted, the opportunities for GHG reduction projects will increase.

The Santa Barbara County APCD finds the following protocols for GHG credits to be acceptable for CEQA mitigation:

1. Credits generated within Santa Barbara County per a District-approved protocol;
2. Credits generated within the state of California per an approved District protocol;
3. Credits that meet the requirements of the AB 32 Cap-and-Trade regulation protocols (CARB);
4. Credits that are generated and verified under the CAPCOA GHG Rx program protocols;
5. Credits that are generated and verified under the voluntary SCAQMD Regulation XXVII;
6. Verified credits registered with the Climate Action Reserve or the American Carbon Registry.

In addition, independently verified GHG credits available through other carbon registries that follow specific protocols may be eligible for off-site mitigation, but should be reviewed and approved by the CEQA lead agency prior to being used as mitigation for a specific project.

#### **Registries for GHG Offsets/Credits**

Registries essentially provide a clearinghouse where projects that have reduced GHG emissions, and follow a protocol, can make their reductions available to projects that emit GHGs and might be in need of credits. The Cap-and-Trade program includes a mechanism whereby offset credits can be used, in addition to the allowances issued by CARB or purchased at auction. CARB utilizes some of the credits that are listed with these registries to fulfill this option. There are a number of these registries, and some of them are discussed below.

**CAPCOA (GHG Rx)** – in 2013 CAPCOA set up a registry system called the Greenhouse Gas Reduction Exchange (GHG Rx) that is for California GHG reduction projects only. It was established in cooperation with a number of air districts in California and utilizes protocols that are similar to those listed above. Air districts can provide trained and certified air district staff, or individuals that are CARB-certified, to provide third-party verification of credit projects. The CAPCOA exchange takes advantage of some of the co-benefits, as the GHG reduction projects are all required to be located within California. Also, limiting project location to California allows for a strong degree of control over protocols. Currently, the number of credits available on the GHG Rx is limited, totaling about 2,000 MTCO<sub>2e</sub>.

**Climate Action Reserve** - The Reserve (CAR) began as the California Climate Action Registry, which was created by the State of California in 2001 to address climate change through voluntary calculation and public reporting of emissions. The CAR has over 400 projects listed, with the largest one in California being the Big River/Salmon Creek Forestry Management

Project with about 180,000 MTCO<sub>2</sub>e sequestered in 2013. The CAR issued over 1.2 million MTCO<sub>2</sub>e of credits in 2014 to 40 clients (only 1 of those in California).

**American Carbon Registry** - The American Carbon Registry (ACR) was founded in 1996. The registry has over 150 projects currently listed, mostly in the US, but some in Brazil and Mexico. They have a wider range of protocols available than CAPCOA. Some projects have made available in total as much as 8 million MTCO<sub>2</sub>e associated with carbon sequestration projects over the years. The largest project in California is the Round Table Indian Tribe forestry management project, with over 500,000 MTCO<sub>2</sub>e sequestered over the years through management of a 5,700 acre forest.

**Western Climate Initiative (WCI)** - is a collaboration of jurisdictions working together to identify, evaluate, and implement emission-trading programs to mitigate the impacts of climate change at a sub-national level. Current WCI members are British Columbia, California and Quebec. Under WCI, California and Quebec linked their Cap-and-Trade programs in 2014. WCI manages the Compliance Instrument Tracking Service System, administers allowance auctions, conducts independent market monitoring of allowance auctions, and certifies allowance and offset certificate trade transactions. This system is only open to facilities who are required to be a part of the program.

#### **Gold Standard**

The Gold Standard is a primarily international market for GHG offsets. The Gold Standard has been in existence since 2004 and has certified projects totaling over 20-million tonnes of carbon. The registry currently has over 1,800 projects listed. Most are located internationally, but there are a few projects listed in the U.S.

#### **The “Voluntary” Carbon Market**

The voluntary market refers to the population of projects, and their associated GHG reduction credits/offsets, that were generated throughout the world on a voluntary basis, and were not generated as part of a regulatory program. This market is composed of corporations and government entities that want to prescribe to reducing their GHG emissions as part of a company or government strategy. These efforts are realized through a number of the registries listed above or done privately between reduction programs and buyers. In 2013, approximately 76 million MTCO<sub>2</sub>e were traded on the voluntary market (Forest Trends 2014).

**Others: Brokers, etc.** - There are a number of brokers that utilize the above listed registries to arrange for transactions. Brokers are required to register with the various registries in order to do business on the registry. For example, CAR currently lists 9 brokers on their website. There are also 25 wholesale traders listed on the CAR site that are selling larger quantities of credits to other account holders.

## **What are the costs of GHG mitigation?**

Costing of GHG offsets/credits varies widely worldwide, ranging from \$0.25 to \$95 per MTCO<sub>2</sub>e. On the low end, there were many landfill projects initiated around 2009 in anticipation of a Federal Cap-and-Trade program that didn't materialize. Below are some costs, in \$ per ton, that are currently listed on exchanges.

- California Cap-and-Trade Allowances Feb 2015 (includes fuel suppliers) - \$12.21 per MTCO<sub>2</sub>e

- California Cap-and-Trade Allowances Futures April 16th price - \$12.70 per MTCO<sub>2</sub>e
- Voluntary Carbon Markets (from Forest Trends 2014 report) - \$5.90 per MTCO<sub>2</sub>e average
- Regional Greenhouse Gas Initiative (northeastern States) as of 3/2015 - \$5.41 per MTCO<sub>2</sub>e
- Brokerages:
  - Early vintage (2009) verified U.S. offsets \$0.25 per MTCO<sub>2</sub>e (large quantities >100,000 MTCO<sub>2</sub>e, from landfills in Texas, for example)
  - Current vintage verified U.S. offsets \$1.50-\$2 per MTCO<sub>2</sub>e
  - CARB-certified offsets \$9-11 per MTCO<sub>2</sub>e
- Worldwide
  - European Emissions Trading Scheme (EU ETS) - \$3-5 per MTCO<sub>2</sub>e
  - New Zealand - \$1 per MTCO<sub>2</sub>e
  - Shanghai - \$5 per MTCO<sub>2</sub>e
  - Beijing - \$10 per MTCO<sub>2</sub>e
  - UK Price floor - \$16 per MTCO<sub>2</sub>e
  - Tokyo - \$95 per MTCO<sub>2</sub>e

Projects for On-site reductions, such as heater efficiency improvements at \$15,000 per 2 mmbtu/hr unit, can yield GHG reductions at a cost of approximately \$17 per MTCO<sub>2</sub>e assuming full load and 10 year unit life.

Local mitigation projects:

- SLOC Energy Retrofit Program \$0 - \$150 per MTCO<sub>2</sub>e depending on handling of monthly cost savings.
- UCSB Bren School Group Project investigated feasibility of Santa Barbara County mitigation; costs range from negative costs of \$600 or greater (a cost benefit) per MTCO<sub>2</sub>e (for renewable energy and energy efficiency projects) to a positive cost of \$800 or greater per MTCO<sub>2</sub>e.

### ***How are GHG mitigation strategies implemented?***

Depending on the CEQA thresholds utilized, mitigation may or may not be required for a project in the form of GHG offset credits. Onsite measures that reduce GHG emissions, including increased efficiency or equipment replacement, would not require GHG offset credits, but would need to be verified and approved by the applicable CEQA lead agency as part of the facility's project approval process.

Depending on how the facility fits into the threshold criteria would define how mitigation is applied. In general, all facilities subject to CEQA would be required to report GHG emissions annually. All emissions sources at the facility, including combustion sources, venting and fugitive emissions, should be reported, along with GHG emissions associated with electricity use and offsite vehicle use.

A facility may fit into different scenarios in different years depending on the reported level of GHG emissions. All facilities subject to CEQA should report annually to ensure that they are complying with CEQA thresholds and mitigation. For example, a facility may initially emit less than 25,000 MT/yr, but if

emissions increase, it may become subject to the Cap-and-Trade program, thereby requiring different reporting efforts and GHG offset credit obligations.

**Cap-and-Trade Considerations**

Through the Cap-and-Trade program, CARB issues allowances to be used as compliance obligations under the program. Some allowances are freely allocated by CARB according to industry benchmark values and an “industry assistance” factor. Allowances can also be purchased on the CARB auction or purchased directly from other participants. CARB-qualified offsets can also be used for a portion of the Cap and Trade program compliance obligations. Freely allocated allowances are issued to some industry sectors based on the potential for “leakage”, or the movement of the industry out of state to avoid the Cap-and-Trade program. The decision to allow credit for the Cap-and-Trade program under CEQA as “GHG reduction plan” or to allow for the use of allowances as mitigation should be determined by each lead agency.

CEQA and CEQA case law requires that mitigation be feasible, not vague or deferred, specific, certain, and enforceable. Allowances provided freely to an entity may not be considered to meet this CEQA test for mitigation as no specific action is associated with the mitigation. Allowances purchased on the CARB auction, however, provide funding for the CARB GHG Reduction Fund, which provides funding for various programs, including home weatherization, wetlands restoration and transit improvements (CARB 2015) and can be associated with a specific reduction. These purchased allowances or offsets that are above and beyond the amount freely allocated by CARB represent a GHG benefit (i.e., through reductions in emissions that would have occurred elsewhere, through an offset project done under a CARB-approved protocol, or through a GHG reduction initiative funded with revenue from auctioned allowances).

Note that in 2015, fuel suppliers are required to purchase allocations for the carbon equivalent of all fuel sold. Fuel suppliers do not receive free allocations. Natural gas and electricity suppliers receive some free allocations.

**Scenarios**

A number of different mitigation scenarios are discussed below, from small sources that are not subject to mitigation requirements to large sources subject to the Cap-and-Trade program.

**❖ Scenario 1: Project with emissions below a bright line or other numeric threshold**

In this scenario, the project’s GHG emissions are below a bright line or other numeric CEQA significance threshold. The facility should still periodically report GHG emissions, or a simplified surrogate such as fuel use, to ensure that the facility stays below the threshold. The facility would not have to obtain GHG offset credits or implement any required efficiency standards. As with all of the categories, GHG emissions related to the use of transportation fuel, purchased natural gas and electricity would be reduced to some extent through the Cap-and-Trade program and the facility would therefore still be contributing to GHG reduction efforts.

❖ **Scenario 2: Project with emissions above a bright line or other numeric threshold, but not subject to Cap-and-Trade program**

In this scenario, the project's GHG emissions are above a bright line CEQA significance threshold but are below the Cap-and-Trade threshold of 25,000 MTCO<sub>2</sub>e annually. As per the California mandatory reporting requirements, for facilities with emissions between 10,000 and 25,000 MTCO<sub>2</sub>e, operators have the option to file an abbreviated report (section 95103(a)) using simpler emission calculation methods, and they are not subject to third-party verification, missing data substitution, and calibration and accuracy requirements. Also, suppliers of petroleum products and natural gas are required to report if they emit greater than 10,000 MTCO<sub>2</sub>e annually. The CEQA lead agency may decide to accept the abbreviated report in lieu of local reporting requirements. For facilities emitting less than 10,000 MTCO<sub>2</sub>e annually that emit more than a numeric bright line threshold, the facility may be required to report GHG emissions annually to the local CEQA lead agency. For all emissions above the CEQA significance threshold, the facility would be required to provide GHG offset credit as mitigation.

❖ **Scenario 3: Project that is subject to the Cap-and-Trade program but is still subject to a bright line threshold**

In this scenario, the project's GHG emissions are above a bright line CEQA significance threshold, and are also greater than 25,000 MTCO<sub>2</sub>e/yr, meaning that the stationary source is subject to the Cap-and-Trade program. Reporting and monitoring/verification would be required as part of the Cap-and-Trade program. The CEQA lead agency should consider harmonizing the Cap-and-Trade-required reports and compliance periods with the CEQA mitigation requirements. GHG emissions associated with electricity and offsite vehicle use are not reported under the Cap-and-Trade program, so they may need to be quantified and mitigated separately. Under this scenario, the facility would obtain GHG offset credits for all GHG emissions that are above the CEQA threshold that is applied to the project. Cap-and-Trade allowances and/or Cap-and-Trade offset credits may be used as GHG offset credits for compliance with a CEQA mitigation strategy. The lead agency should determine whether allowances that are freely allocated by CARB according to the industry assistance factor should be accepted, as discussed above.

❖ **Scenario 4: Project that is subject to the Cap-and-Trade program, with the consideration that Cap-and-Trade is a qualified GHG reduction plan**

In this scenario, the project emits greater than 25,000 MTCO<sub>2</sub>e/yr, is a source subject to the Cap-and-Trade program, and the CEQA lead agency considers that the Cap-and-Trade program is a "qualified GHG reduction plan". In this scenario, the CEQA lead agency considers that a facility's participation in the Cap-and-Trade program fully mitigates GHG impacts. Therefore, the facility would have no ongoing CEQA mitigation requirements beyond what is required by participation in Cap-and-Trade. However, the CEQA lead agency may still require the covered entity to report GHG emissions and Cap-and-Trade compliance information, to ensure that the facility continues to achieve mitigation through the Cap-and-Trade program.

❖ **Scenario 5: Project that is subject to best practices or performance-based standards**

In this scenario, the project would be subject to the requirements associated with best performance standards. As discussed above, this could be a heater with the required design features. The lead agency may utilize a screening threshold which would eliminate smaller projects or projects that might not normally be subject at an APCD permit. Projects implementing best performance standards could be evaluated to determine whether the performance standards provide a “fair share” of mitigation to deem the impact to be less than cumulatively significant. Or, performance standards can be used as part of a suite of mitigation measures designed to reduce the impact to less than cumulatively significant.

***What should be included in a GHG Mitigation Monitoring and Reporting Plan?***

Under some of the above scenarios, the project would be required to submit a GHG Mitigation Monitoring and Reporting Plan, in line with CEQA requirements for a mitigation monitoring plan (15097). The GHG Plan would address the following issues:

- A description of the project and the GHG emission sources. Identify all equipment, processes, and operations that will be subject to monitoring requirements, including applicable indirect sources such as transportation, electricity, water, wastewater, and waste sources.
- A description of the emissions calculation methodologies for each GHG source, including
  - Emission factors,
  - Fuel Source/type,
  - Measurement requirements,
  - Mobile and indirect sources (if applicable).
- Project-specific reporting requirements including reporting periods and due dates. All of the mitigation monitoring and reporting requirements that are laid out in the project approval conditions should be re-iterated in the plan.
- How reporting correlates with other programs (such as Cap-and-Trade).
- An example report that would be submitted to demonstrate compliance with the plan.

## **Definition of Terms and Acronyms**

AB 32 - Global Warming Solutions Act of 2006 requires California to reduce its GHG emissions to 1990 levels by 2020

AB 32 Scoping Plan - AB 32 requires CARB to develop a Scoping Plan which lays out California's strategy for meeting the AB 32 goals. The Scoping Plan must be updated every five years. In December 2008, the CARB approved the initial Scoping Plan, which included a suite of measures to reduce GHG emissions. In May 2014, CARB approved the First Update to the Climate Change Scoping Plan.

ACR - American Carbon Registry

Allowance - Equal to one MTCO<sub>2e</sub> emitted from a facility as part of the Cap-and-Trade program. Allowances are freely allocated by the CARB and can be purchased from other entities or from the CARB auction. Approximately each year, facilities under Cap-and-Trade must submit allowances equal to their annual GHG emissions.

APCD - Air Pollution Control District

BPS - Best performance standards

CEQA - California Environmental Quality Act

Cap-and-Trade - Cap-and-Trade is a market based regulation that is designed to reduce GHGs from multiple sources. Cap-and-Trade sets a limit or cap on GHGs. The cap will decline approximately 3 percent each year beginning in 2013.. The Cap-and-Trade program is estimated to cover 85% of the GHG emissions in the State and includes natural gas and fuels (gasoline, diesel, propane, natural gas)

CAPCOA - California Air Pollution Control Officers Association

CAR - Climate Action Reserve

CARB - California Air Resources Board

CARB GHG Reduction Fund - A fund created as part of the Cap-and-Trade program where the revenue from sold Allowances would be placed and the proceeds would be used to fund GHG reductions programs Statewide.

GHG Rx - the CARB exchange for the trading of GHG offsets

GHG - greenhouse gas

MTCO<sub>2e</sub> - metric tons of carbon dioxide equivalent. Includes methane and nitrous oxide and all other GHG gasses along with their respective global warming potentials.

MTCO<sub>2e</sub>/yr - MTCO<sub>2e</sub> emitted per year

RGGI - Regional Greenhouse Gas Initiative (northeastern States)

SCAQMD - South Coast Air Quality Management District

SLOC - San Luis Obispo County

WCI - Western Climate Initiative



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