

Environmental Health Coalition

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November 7, 2008

California Energy Commission
Dockets Office, MS-4
RE: Docket No. 08-GHG Oil-1
1516 Ninth Street
Sacramento, CA 95814-5512

DOCKET

08-GHGOII-1

DATE NOV 07 2008

RECD. NOV 07 2008

By Email: docket@energy.state.ca.us

RE: Docket No. 08-GHG OII-1—Comments of Environmental Health Coalition on California Environmental Quality Act Requirements Relating to Greenhouse Gas Emission Impacts of Power Plants.

Dear Commissioners Byron and Douglas:

Environmental Health Coalition welcomes the opportunity to provide input into the important responsibility that the California Energy Commission (CEC) has regarding assessing the greenhouse gas (GHG) impacts of power plants under the California Environmental Quality Act (CEQA). Environmental Health Coalition (EHC) is one of the oldest environmental justice organizations in California and is a member of the Environmental Justice Advisory Committee for AB 32. We have a deep interest and experience in the impacts of power plants on communities and the environmental justice implications of the siting process and analysis.

We understand that the CEC is the lead agency under CEQA for the siting of all power plants (50 MW or greater) that are proposed for construction or operation in the state. EHC appreciates your solicitation for input from impacted stakeholders on this important issue. We also would like to take this opportunity to respond to some of the comments made at the workshop on October 29, 2008.

To summarize our comments we recommend that the CEC:

- Quantify and fully disclose anticipated GHG emissions from proposed projects;
- Quantify and fully disclose assumptions concerning the existing “baseline” for impact analysis;
- Use a ‘zero’ threshold to determine significance of project emissions as compared to the baseline;
- Propose feasible alternatives and enforceable mitigation measures to reduce or eliminate impacts;

- Close all loopholes that potentially exempt projects from analysis and mitigation of impacts;
- Evaluate and mitigate projects on a project-by-project basis;
- Include GHG emissions from fuel type and construction/demolition in analysis;
- Prioritize actions that implement the loading order in development of mitigation measures and alternatives; and,
- Adopt a plan to accelerate a phase out of aging power plants while achieving GHG reductions.

We have responded to the questions in order below in detail.

1. *GHG emissions have a cumulative impact on climate change that is global by nature. Are such global impacts appropriately subject to CEQA?*

Emphatically, yes! There is no longer any reasonable basis to argue that climate change impacts are not subject to analysis under CEQA. Applying National Environmental Policy Act (“NEPA”) standards for cumulative impacts analysis—standards analogous to those used under CEQA—the Ninth Circuit recently held that “[t]he impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct.” *Center for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008). California trial courts have agreed, invalidating CEQA documents that failed to address these impacts. *See, e.g., Center for Biological Diversity v. City of Desert Hot Springs*, No. RIC464585 (Riverside Co. Super. Ct. Aug. 6, 2008). Consistent with these decisions, the Governor’s Office of Planning and Research recently issued a technical advisory stating that

[e]ach public agency that is a lead agency for complying with CEQA needs to develop its own approach to performing a climate change analysis for projects that generate GHG emissions. A consistent approach should be applied for the analysis of all such projects, and the analysis must be based on best available information. For these projects, compliance with CEQA entails three basic steps: identify and quantify the GHG emissions; assess the significance of the impact on climate change; and if the impact is found to be significant, identify alternatives and/or mitigation measures that will reduce the impact below significance.¹

GHG emissions must be subject to CEQA analysis because they contribute to the significant cumulative environmental effects of climate change. California agencies, including the CEC, thus cannot approve projects without adopting all feasible mitigation measures and/or alternatives that could reduce those impacts to a less than significant level. Pub. Res. Code §§ 21002, 21002.1. The CEC *cannot* certify power plants without complying with these mandates. The CEC therefore cannot defer analysis of particular project’s impacts pending the outcome of regulatory processes before other agencies such as the California Air Resources Board (“CARB”).

¹ Office of Planning and Research, *CEQA and Climate Change Technical Advisory* (June 2008) at 5, available at <http://opr.ca.gov/index.php?a=ceqa/index.html>.

Because the electricity sector is so important to achievement of California's greenhouse gas reduction goals, it is important not only that the CEC comply with CEQA, but also that the CEC do so properly, emphasizing needs assessment and feasible alternatives before considering offsets or other mitigation.

CEC should consider that not all projects are needed.

We understand that how the CEC is currently allowed to consider need is limited. But, in this new era of climate change, it would be beneficial to establish rules or a very high hurdle of proof that a GHG emitting project is even needed. Not every power plant that is desired by utilities or merchant companies is appropriate for the location or even needed at all. Many communities are in the situation where their health and communities are being degraded unnecessarily by projects that are not even needed to secure our energy future.

CEC should require a robust alternatives analysis including hybrid and 'climate preferred' projects.

Alternatives analysis is one of the cornerstones of CEQA. The assessment of alternatives should be robust in light of the imperative need to reduce GHG emissions. EHC recommends that CEC require all project proponents to propose, analyze, and identify a viable "climate superior" alternative along the lines of the CEQA-required "environmentally superior" alternative. *See* CEQA Guidelines § 15126.6(e)(2). The CEC should take the next step (as does the Coastal Commission) and prioritize the least damaging alternative under certain conditions.

The CEC should also require that a "climate superior" alternative project not be limited to a single generation type. The CEC should promote the concept of a required "hybrid" option for generation in all alternatives analyses much like the required "no project" alternative. This concept would use multiple generation types, preferably those listed early in the CEC's own Preferred Loading Order, to provide an equivalent amount of generation or equivalent impact on the grid at a reduced GHG emission rate. These hybrid alternatives should include energy efficiency, renewable energy, distributed energy, and other approaches that reduce GHG emissions as compared to fossil-fired power plants.

For example, an alternative to a 100MW natural gas fired peaker plant could be a project that included two 10 MW CHP units, one 20 MW CHP unit, 5 MW of stationary fuel cells, equivalent reduction of 5 MW of peak demand through energy efficiency in identified buildings, 5 MW of rooftop solar on existing buildings and a 50 MW peaker plant. Impacts to the grid from the deployment of distributed generation and some emission-free renewables and efficiency should be considered against the centralized polluting fossil-fueled proposal. The CEC will be doing merchant generators a favor in encouraging them to diversify into other types of generation. Even though, under current rules, the CEC may not be able to permit or require a hybrid option that was superior for the climate, you should be able to deny a project that was not 'as good as it could be' for the climate. CEQA is as a law of disclosure and awareness of impacts of decisions and better environmental alternatives and should be used as a tool to express these values in CEC decision-making.

Environmental Justice impacts should be analyzed.

We understand that GHG emissions have significant global impacts. But, in addition, power plants also have highly localized co-pollutant impacts on nearby communities who are, too often, environmental justice communities. These are the same communities that will be hardest hit by the negative impacts of climate change. Analysis of global, local, and environmental justice impacts should be included in analysis.

2. *Assuming CEQA does apply, what should be the CEQA ‘threshold of significance’ for GHG emissions from a given project? What GHG emission levels are less than ‘cumulatively considerable?’ Should power plant construction emissions and ‘peaking’ gas-fired power plant” be considered?*

In the face of the economic, environmental, and societal crisis we are facing from GHG induced climate change, and in light of the GHG reduction mandates of AB 32 and Executive Order S-3-05, the state must take immediate steps to **reduce** current greenhouse gas emission levels. Therefore, **any new sources of GHG emissions should be considered significant.**

The current scientific consensus is that in order to avoid the dangerous—even catastrophic—consequences of climate change, atmospheric concentrations of CO₂e must be reduced to 450 ppm by 2050. AB 32 and Executive Order S-3-05 together aim to reduce California’s GHG emissions to 80% below 1990 levels by 2050, which is consistent with the 450 ppm target. Emerging scientific evidence, however, shows that even this dramatic level of reduction may be insufficient to avoid dangerous climate change, and that a target of 350 ppm may be necessary.² As the courts have held, “the greater the existing environmental problems are, the lower the threshold for treating a project’s contribution to cumulative impacts as significant.” *Communities for a Better Env’t v. Cal. Res. Agency*, 103 Cal. App. 4th 98, 120 (2002). Under these circumstances, any additional contribution of GHGs above baseline levels must be considered cumulatively significant, and must be mitigated or avoided to the extent feasible.

Other agencies and organizations considering this question agree that the threshold of significance for climate change impacts must be set very low, if not actually at zero. The California Air Pollution Control Officers Association (“CAPCOA”) has concluded that the only thresholds of significance capable of achieving AB 32 and Executive Order S-3-05 goals are (1) a threshold of zero, as EHC recommends, or (2) a threshold that captures 90% or more of likely future discretionary projects.³ Just two weeks ago, staff of the California Air Resources Board recommended a presumptive threshold of significance of 7,000 MTCO₂e/yr for industrial

² James Hansen, NASA’s foremost climatologist, reached this conclusion based on the melting of the Arctic sea ice at a rate not predicted by prevailing models. See Hansen, J. et al., *Target Atmospheric CO₂: Where Should Humanity Aim?* (April 2008) available at <http://www.columbia.edu/~jeh1>.

³ See California Air Pollution Control Officers’ Association, *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act* (Jan. 2008) at 56-57, available at <http://www.capcoa.org/ceqa/CAPCOA%20White%20Paper%20-%20CEQA%20and%20Climate%20Change.pdf>.

projects.⁴ Again, EHC strongly believes that a zero threshold is the only defensible threshold given the serious consequences of failing to achieve **at least** the reductions mandated by AB 32 and Executive Order S-3-05.

Construction/demolition emissions should be included in GHG analysis.

CEQA requires analysis of the “whole of the action” that has a potential for causing direct or indirect changes to the environment. § 15378(a); *Laurel Heights Improvement Assn. v. Regents of Univ. of Cal.*, 47 Cal. 3d 376, 395-398 (1988). The CEC therefore must consider GHG impacts from construction and decommissioning/demolition phases of each project. Construction and decommissioning/demolition emissions can be very significant and should be part of the assessment of the impact of the project.

Fuel type should be included in GHG analysis.

The type of fuel proposed for use is also an integral part of the “whole of the action” that must be analyzed under CEQA. In southern California, we are especially concerned about the exacerbated environmental and GHG impacts from the use of LNG imported from the Sempres LNG terminal in Baja California, Mexico. Unfortunately, LNG seems to be a blind-spot in current state energy policy. This is a significant issue as the statewide goals of reducing GHG emissions and importing LNG are contradictory. The process of extracting natural gas from foreign sources, transporting it to an export facility, liquefying it, transporting it thousands of miles overseas, and re-gasifying it in North America carries a heavy “energy penalty.” This translates directly into considerably higher total GHG emissions associated with LNG production and delivery than with North American natural gas.

The entire process of bringing LNG to California increases total emissions between 18 and 40 percent over current emissions from use of domestic natural gas. While LNG proponents argue that (due to higher butane content) the LNG may burn ‘hotter’ so less fuel will be needed, it is unknown if this will produce less GHG. However, South Coast Air Quality Management District among others have called for a full environmental assessment of the full environmental and health impacts of LNG which are viewed to be higher than with domestic supplies. This is a very important issue that the Commission should include in their assessments.

The need to assess the life-cycle GHG emissions of fuel also applies to the consideration of permitting new nuclear plants. The GHG associated with the mining, manufacture, construction, decommissioning, protection, and long-term storage of nuclear fuel and power plants must be considered in role the Commission plays in the permitting of new nuclear plants or in removing the ban for new nuclear plants.

3. *What is the proper CEQA “baseline” for determining the significance of GHG emissions? Are all new power plant projects with emissions that exceed some threshold*

⁴ California Air Resources Board, Preliminary Draft Staff Proposal, *Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases Under the California Environmental Quality Act* (Oct. 24, 2008) at p. 10, available at <http://www.arb.ca.gov/cc/localgov/ceqa/meetings/102708/prelimdraftproposal102408.pdf>.

level “cumulatively considerable” (so called “zero baseline”)? If so, would the zero baseline apply to solar facilities that burn some natural gas for startup or for generation augmentation?

The “baseline” for environmental analysis under CEQA normally consists of “the physical environmental conditions in the vicinity of the project” at the time that notice of environmental review is published. CEQA Guidelines § 15125(a). The courts have repeatedly held that a proposed project’s impacts must be compared to “real conditions on the ground.” *See, e.g., Save Our Peninsula Committee v. Board of Supervisors*, 87 Cal. App. 4th 99, 121 (2001). By contrast, a project’s impacts may not be evaluated only in relation to a speculative future scenario. *See Woodward Park Homeowners Ass’n v. City of Fresno*, 150 Cal. App. 4th 683, 708-09 (2007). Assumptions underlying the choice of a baseline must be clearly and conspicuously identified in the environmental document and supported with substantial evidence in the record. *San Joaquin Raptor Rescue Ctr. v. County of Merced*, 149 Cal. App. 4th 645, 659 (2007).

The Commission’s questions appear to conflate the baseline with the threshold of significance for cumulative impacts. Nomenclature notwithstanding, any increase in GHG emissions above existing conditions must be considered significant. Again, under AB 32 and other state policy, the state must implement actions to **decrease** greenhouse gas emissions dramatically over a very short time period. Also, as mentioned above, a life cycle/lifetime analysis (including construction emissions and fuel type) should be considered in the analysis of significance. Furthermore, the emissions should be evaluated in and counted in terms of maximum, overall emissions and not emissions per MW/hour.

The Commission should take all feasible steps to quantify current GHG emissions from the electricity sector in California. A baseline based on unquantified assumptions about the entire generation “system” is too unreliable to provide an accurate assessment of the emissions or impacts of the project on climate change. Conclusions regarding both the existing baseline and a particular project’s impacts must be supported with quantitative data.

Finally, CEQA requires analysis of the environmental impacts of all projects that do not fall under one of the specific “categorical exemptions” specified by the Legislature or the Resources Agency. Pub. Res. Code §§ 21080(b), 21084. The Commission has no unilateral authority to forego analysis of any class of generation projects that has not specifically been exempted from CEQA. *See generally Mountain Lion Found. v. Cal. Fish & Game Comm’n*, 16 Cal. 4th 105 (1997). No matter what characteristics a project has, the Commission must quantify GHG emissions, measure them against a defensible and quantitative baseline, determine their significance, and propose feasible mitigation measures or alternatives.

3.c. *Should certain generation technologies be considered categorically less than significant?—re-powered coastal gas-fired facilities that are more efficient than the existing facilities and eliminate once-through cooling impacts on the marine environment?*

As explained above, it is not for the Commission to determine whether certain generation technologies should be considered categorically less than significant. The Commission may not create CEQA exemptions on its own. Even if it could, such an approach would be inadvisable given the potential variation between projects. A re-powered gas-fired facility, for example, could theoretically reduce GHG emissions as compared to an existing facility. Without quantifying its emissions, however, and comparing those emissions to those of the existing facility, as well as considering impacts from construction, decommissioning, fuel choice, potential growth-inducement, increased generation capacity, and so forth, the Commission could not defensibly conclude that the project will have a less-than-significant impact. Nor could the Commission refrain from analyzing any of the project's other impacts, such as co-pollutant impacts, based on an assumption that its GHG emissions were less than significant.

In fact, a similar scenario played out recently in San Diego with the proposed re-powering of the South Bay Power Plant. Although a new, combined-cycle, air-cooled replacement plant was proposed, the overall emission impact of the plant was at least equal to (and could have easily been greater than) the current emissions at the existing plant, due to a potential larger plant size and more frequent operation.

We are strong supporters of decommissioning aging power plants and believe that the CEC should take affirmative action to ensure that this is done. A blanket CEQA exemption, which the Commission lacks legal authority to create in any case, is not the way to achieve this goal. EHC proposed a plan to ensure the speedy retirement of all aging power plants in our comments on CARB's proposals for early action under AB 32. We have offered a suggestion of our plan again below in response to the request for other program ideas.

--Gas fired plants found needed to protect system reliability?

No. Every applicant contends that its power plant is needed to protect system reliability. Such an exemption therefore would be a recipe for business as usual, and could be disastrous in terms of meeting California's emission reductions goals. If power plants are not needed for reliability, they should not be built. If they are, their GHG emissions must be disclosed and analyzed, and feasible mitigation measures and alternatives considered, in accordance with CEQA.

4. *If an individual power plant is found to have a significant cumulative impact due to GHG emissions, is it feasible to mitigate this cumulative impact? Must mitigation meet the standards that apply to criteria pollutants—e.g., that such mitigation must be certain, enduring, and not duplicative of other measures. What feasible mitigation should be required for power plants? If the Commission were to find a power plant's cumulative impacts to be significant, and if impacts cannot feasibly be mitigated to a less than significant level, what if any basis should support CEQA "override" findings to allow project approval?*

The advantage of CO₂ monitoring is that we can look at real, quantifiable numbers. Therefore, we know how much CO₂ a project is projected to emit. We also know how much

mitigation would be needed for a project. Therefore, any mitigation measure must be equally quantifiable and should ensure that the measures will result in a net decrease in CO2 emissions. These mitigation measures must be quantifiable, certain, enduring, enforceable, and non-duplicative.

There are a number of potentially feasible mitigation strategies to offset GHG emissions that cannot be avoided through alternative generation projects. The CEC should require that mitigation measures follow and implement the loading order and should last at least as long as the life of the project. For example, a mitigation program could require that a MW of rooftop solar be developed for every MW of fossil fuel emitting generation permitted. A requirement to fund and implement energy efficiency measures in existing buildings also could make a significant contribution to implementing the loading order, reduce demand, and, if properly quantified, mitigate the impact of the GHG emissions. Solar systems linked to plug-in stations for hybrids and electric vehicles are also good candidates for mitigation that can be developed over time to mitigate long-term emissions. Finally, if a plant will or reasonably could burn fuel (like imported LNG) with higher GHG emissions and higher GHG life cycle costs, the mitigation program should reflect that and ratios and mitigation level must be higher to account for this.

Given the daunting challenge facing California in achieving its GHG reduction goals, the threshold for an “override” of significant impacts remaining after mitigation must be very high. Indeed, the Commission should adopt a general rule that if impacts cannot be mitigated, the application should be rejected. Mitigation measures that will lead to an overall net CO2e **reduction** should be required.

5. *Is it more appropriate to mitigate power plant GHG emission case-by-case or with a more encompassing program?*

These are not mutually exclusive. Under CEQA, the CEC already has a legal responsibility to mitigate power plant GHG emission on a case-by-case basis. In order to fulfill this responsibility, the CEC also could develop a more encompassing program, so long as it provided enforceable, certain, enduring, and non-duplicative measures to ensure that projects’ impacts are actually mitigated. Furthermore, emissions mitigation should be located in proximity to projects so that we avoid the all-too-common scenario where certain communities get stuck with a large polluting facility in their neighborhoods and the benefits of co-pollutant reductions accrue elsewhere. This is another key environmental justice issue.⁵

- c. *If CARB should require a “cap and trade” program pursuant to AB 32, should the adoption of such program change or negate Commission project-by-project mitigation?*

⁵ AB 32, in establishing ground rules for a possible future “cap and trade” system, addresses the co-pollutant problem in three ways. First, it requires any market-based mechanism to consider impacts on communities already adversely impacted by air pollution. Second, it requires the mechanism to prevent increases in toxic or criteria co-pollutants. Third, it requires the mechanism to “[m]aximize additional environmental and economic benefits for California, as appropriate.” Health & Saf. Code § 38570(b). This provides strong support for a mitigation program that will actually improve conditions in already impacted communities.

Cap and trade should **not** be taken into account in the GHG assessment. Cap and trade allows the right to pollute, but does not itself provide for mitigation of a particular plant's emissions. The project may end up reducing its emissions due to the cap and trade program, but such reductions are too uncertain to be taken into account in the assessment.

d. Should programmatic mitigation require GHG reductions from "load serving entities" such as utilities rather than from individual in-state power plants?

The question assumes that the CEC may forego requiring mitigation from individual in-state power plants in favor of requiring mitigation from other entities. This once again seems to overlook the CEC's fundamental responsibilities under CEQA: in considering individual power plant projects, the CEC must disclose and analyze their significant impacts, and may not issue approvals unless all feasible mitigation measures or alternatives to avoid or lessen those impacts have been adopted. In the absence of discretionary approval authority over projects proposed by load-serving entities, it is not clear that the CEC even has authority to require mitigation from these entities as a substitute for mitigation of impacts from projects under its jurisdiction. Under CEQA, the CEC has a responsibility to mitigate the impacts of the projects it approves. The CEC's efforts should be directed toward implementing, not avoiding, that responsibility.

f. Are there other programs that should be considered?

As mentioned above, we are strong supporters of decommissioning aging power plants and believe that the CEC should take affirmative action to ensure that this is done. EHC proposed a plan to ensure the timely retirement of all aging power plants to CARB in response to requests for early action proposals under AB 32. EHC's phase-out plan proposed that CARB adopt a per-megawatt hour performance standard for carbon dioxide emissions from pre-1980 power plants rated at over 100 MW. The standard would be based on carbon dioxide emissions from a benchmark state-of-the-art combined cycle power plant. Regulated plants would be required to meet this standard by a pre-determined date or else cease operation. In the years leading up to the deadline, the proposal would require the regulated plants to ratchet down their CO2 emissions according to a fixed schedule.

The CEC should partner with CARB and implement this or another plan to ensure that these aging plants are decommissioned soon. Again, our local experience is telling and frustrating. In 1999, the San Diego Port District purchased the aging South Bay Power Plant (SBPP). At that time, the community was told that when new generation was developed in the region equal to the SBPP, it would be removed. However, in the intervening years, new generation far in excess of the SBPP has been put on-line, but CalISO has been unwilling to lift the current RMR designation **on any portion** of the SBPP. The CEC must act on this issue because other agencies are, apparently, unwilling to.

6. The Commission is authorized to certify a facility even if it does not conform to applicable state, local, or region standards...should this general provision of the law be understood to allow an override of unmitigated GHG emissions if the Commission

believe the facility is “needed.”? If “need” become a rationale for certification of unmitigated facilities, is there a limit on the amount of capacity “needed”?

The Commission should refrain from heading down this slippery slope. If “need” becomes the basis for “override” of unmitigated GHG emissions, we will remain on the same “business as usual” path that will eventually lead to catastrophic climate change. In addition, there is no reason to adopt such a dangerous approach. GHG emissions can and should be mitigated. There are alternative energy generation sources that can replace or mitigate polluting generation.

If the CEC adopts this approach, we will never actualize the actions we need to reduce our demand and curb our energy appetites. What we really need are strong, affirmative, and concrete actions to implement the Loading Order and the net-zero construction goals of the CEC as soon as possible. If we continue to approve additional, GHG-intensive generation projects based on the “need” to stay ahead of ever-increasing consumer demand, these policies will continue to be frustrated, and the electricity sector will continue to undermine California’s GHG reduction mandates. What we truly “need” is to follow the loading order, curb GHG emissions, and reduce the impacts of climate change.

7. *The Commission has licensed numerous power plants that have not yet been constructed, some of which have had licenses expire and others have been surrendered voluntarily. To what extent should such “failure” to construct and operate a licensed facility be taken into account in determining whether a power plant’s emissions are significant?*

The question is not entirely clear. In assessing cumulative impacts, the CEC must consider a project’s effects in conjunction with the effects of reasonably foreseeable probable future projects. See CEQA Guidelines §§ 15130, 15355. Potential GHG emissions from already permitted projects that foreseeably may be constructed must be considered as additional, cumulatively significant impacts in conjunction with any proposed project. Unbuilt power plants, however, are not part of the existing physical condition and should not be counted in the “baseline” for environmental analysis.

Under no circumstances may an applicant’s failure to build a previously permitted project be used to offset or discount the emissions from a current, proposed project. Again, CEQA requires analysis of a project’s actual impacts as compared to existing physical conditions, and does not permit agencies to compare projects only to speculative future conditions that will never occur. The state needs real CO₂ reductions immediately to ensure that our AB 32 goals are met. Therefore, any assessment that precludes analysis of a project’s *actual* net increase in emissions must be rejected. The failure of another CO₂ emitting power plant to be constructed or become operational should not provide an opportunity for another project to be constructed or become operational.

In closing, we thank the members of the CEC and staff for the opportunity to address this very important issue and we look forward to being involved in the future.

Sincerely,

ORIGINAL SIGNED BY

Laura Hunter, Clean Bay Campaign Director
Environmental Health Coalition

Attachments:

California Air Resources Board, Preliminary Draft Staff Proposal, *Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases Under the California Environmental Quality Act* (Oct. 24, 2008) at p. 10, available at <http://www.arb.ca.gov/cc/localgov/ceqa/meetings/102708/prelimdraftproposal102408.pdf>.

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Office of Planning and Research, *CEQA and Climate Change Technical Advisory* (June 2008) at 5, available at <http://opr.ca.gov/index.php?a=ceqa/index.html>.

California Air Resources Board

Preliminary Draft Staff Proposal

**Recommended Approaches for Setting
Interim Significance Thresholds
for Greenhouse Gases under the
California Environmental Quality Act**

Released: October 24, 2008

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DOCUMENT AVAILABILITY

Electronic copies of this document and related materials can be found at: <http://www.arb.ca.gov/cc/localgov/ceqa/ceqa.htm>. Alternatively, paper copies may be obtained from the Board's Public Information Office, 1001 I Street, 1st Floor, Visitors and Environmental Services Center, Sacramento, California, 95814, (916) 322-2990.

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INTRODUCTION

Climate change is one of the most serious environmental problems facing the world, the United States, and California today. In this State, climate change already is impacting our coastlines, water supplies, agriculture, and public health, and putting millions of acres of forested land at increased risk of fire. These adverse effects will only increase in number and intensity if we do not promptly and substantially reduce pollution of the atmosphere with greenhouse gases (GHGs).

California law provides that climate change is an environmental effect subject to the California Environmental Quality Act (CEQA).¹ Lead agencies therefore are obligated to determine whether a project's climate change-related effects may be significant, requiring preparation of an Environmental Impact Report,² and to impose feasible mitigation to substantially lessen any significant effects.³ Determining significance, however, can be a challenging task. Accordingly, the Governor's Office of Planning and Research in its June 2008 Technical Advisory, "CEQA and Climate Change,"⁴ asked the Air Resources Board (ARB) to make recommendations for GHG-related thresholds of significance – identifiable benchmarks or standards that assist lead agencies in the significance determination.⁵

With this Staff Proposal, ARB staff is taking the first step toward developing recommended statewide interim thresholds of significance for GHGs that may be adopted by local agencies for their own use. The task that ARB staff is undertaking is, however, a limited one. Staff will not attempt to address every type of project that may be subject to CEQA, but instead will focus on common project types that, collectively, are responsible for substantial GHG emissions – specifically, industrial, residential, and commercial projects.⁶ ARB staff believes that thresholds in these important sectors will advance our climate objectives, streamline project review, and encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the State.

Staff intends to make its final recommendations on thresholds in early 2009, in order to harmonize with OPR's timeline for issuing draft CEQA guidelines addressing GHG emissions⁷ and to provide much needed guidance to lead agencies in the near term.

Public, stakeholder, and local lead agency participation is essential to the success of this project. ARB staff believes that the comment and feedback it receives, along with

¹ Senate Bill 97, Public Resources Code, § 21083.05.

² California Code of Regulations, tit. 14, § 15064, subd. (f)(1).

³ Id., § 15021, subd. (a)(2).

⁴ See: <http://opr.ca.gov/download.php?dl=ceqa/pdfs/june08-ceqa.pdf>

⁵ Id., § 15064.7, subd. (a).

⁶ The collective greenhouse gas emissions from the industrial, residential and commercial sectors, together with the transportation sector, represent approximately 80% of the statewide greenhouse gas emissions inventory in 2004.

⁷ See Senate Bill 97, Public Resources Code § 21083.05 (providing that draft guidelines are due June 1, 2009).

additional data and analyses, can form a body of evidence that lead agencies may rely on in adopting thresholds of significance consistent with ARB staff's recommendations.

Because the schedule is expedited, staff's recommendations must necessarily be interim and subject to review and revision as more information becomes available.⁸

BACKGROUND

Significance Under CEQA

A significant effect on the environment means a substantial, or potentially substantial, change in the environment caused directly or indirectly by the project.⁹ The incremental effect of a project can be significant when it is cumulatively considerable – that is, when the effect is added to that of other past, present, and reasonably foreseeable probable future projects that also contribute to the problem.¹⁰

To streamline and facilitate consistency in the significance determination, the CEQA Guidelines¹¹ encourage agencies “to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects.”¹² A threshold of significance is an identifiable quantitative, qualitative or performance level that marks the division between an impact that is significant and one that is not. A threshold of significance gives rise to a presumption, which can be rebutted by evidence that the threshold should not apply to a particular project.

Thresholds of significance must be supported by “substantial evidence.” This does not mean that there is one best threshold. In CEQA, substantial evidence “means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached.”¹³

Climate Change and GHG Thresholds of Significance

“The capacity of the environment is limited, and it is the intent of the Legislature that the government of the state take immediate steps to identify any critical thresholds for the health and safety of the people of the state and take all coordinated actions necessary to prevent such thresholds being reached.”¹⁴ But where should a threshold of significance be set for GHG emissions and climate change? This question can be answered only after considering the nature of the environmental problem.

⁸ ARB staff intends to monitor the implementation of thresholds that are adopted as a result of this process for effectiveness. In the same time frame as the update of the AB 32 Scoping Plan, staff intends to revisit its recommendations and to modify them if necessary.

⁹ California Code of Regulations, title 14, §§ 15064, subd. (d), 15382.

¹⁰ *Id.*, § 15355, subd. (b).

¹¹ *Id.*, § 15000, et. seq.

¹² *Id.*, § 15064.7, subd. (a).

¹³ *Id.*, § 15384, subd. (a).

¹⁴ Public Resources Code, § 21000, subd. (d).

There is a scientific consensus that human activities, chief among them the burning of fossil fuels, profoundly affect the world's climate by increasing the atmospheric concentration of GHG beyond natural levels. Contributing additional GHG pollution to the atmosphere leads to higher global average temperatures, changes to climate, and adverse environmental impacts here in California and around the world.¹⁵ Climate change, caused by “collectively significant projects taking place over a period of time[,]”¹⁶ is a quintessential cumulative impact.

The experts tell us that an additional increase in global average temperatures of just 2 degrees Celsius (3.6 degrees Fahrenheit) is very likely dangerous.¹⁷ With a 2 degree Celsius increase, disastrous effects become likely, including more extreme and more frequent severe weather, more wildfires, greater frequency of droughts and floods, rapid and higher sea level rise, and increased habitat destruction and extinctions.¹⁸ These environmental effects will undoubtedly lead to serious economic, political, and national security disruptions.

In order to reduce the risk of dangerous climate change, we must stabilize atmospheric levels of GHGs at approximately 450 parts per million (ppm) by mid-century.¹⁹ We are fast approaching this limit. Since the beginning of the industrial era, atmospheric concentrations of carbon dioxide, the primary GHG, have climbed to their highest point in the last half-million years, increasing from just under 300 ppm at the turn of the last century, to over 380 ppm today, and rising at about 2 ppm per year.²⁰

In response to the challenge of climate change, California has taken a leadership role by committing to reduce its GHG emissions to 1990 levels by 2020 (about a thirty percent reduction in business-as-usual emissions in 2020) and to eighty percent below 1990 levels by 2050.²¹ The latter target is consistent with the scientific consensus of the reductions needed to stabilize atmospheric levels of GHGs at 450 ppm by mid-century. Assembly Bill 32, the Global Warming Solutions Act of 2006, codifies the 2020 reduction

¹⁵ There is a large body of authoritative sources on the causes and current and projected impacts of climate change. An extended discussion of climate change is beyond the scope of this Staff Proposal. For additional information, ARB recommends the Fourth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC) and, in particular, the IPCC's "Frequently Asked Questions," available at: <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-faqs.pdf> and the 2006 California Climate Action Team's Report to the Governor and Legislature, available at: http://www.climatechange.ca.gov/climate_action_team/reports/index.html.

¹⁶ See California Code of Regulations, tit. 14, § 15355, subd. (b).

¹⁷ See IPCC 4th Assessment Report, Working Group II, Summary for Policymakers, Figure 2, available at: <http://www.ipcc.ch/graphics/graphics/ar4-wg2/jpg/spm2.jpg> (chart showing global impacts at various temperature increases); California Climate Change Center, Our Changing Climate: Assessing the Risks to California (2008) at p. 15, available at <http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF> (chart showing impacts in California at various temperature increases.)

¹⁸ *Id.*

¹⁹ See IPCC 4th Assessment Report, Working Group III, Summary for Policymakers at p. 17, available at <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-spm.pdf>.

²⁰ IPCC 4th Assessment Report, Working Group I, Figure FAQ 2.1, available at: <http://www.ipcc.ch/graphics/graphics/ar4-wg1/jpg/faq-2-1-fig-1.jpg>.

²¹ Executive Order S-03-05

target and charges ARB with development of a Scoping Plan to map out how the State will achieve this target, including regulatory, voluntary, and market-based mechanisms beginning in 2012.²²

There is strong need, however, to aggressively address GHG emissions right now. The pollution we contribute to the atmosphere today will continue to have climate impacts for years, decades, and, in some cases, millennia to come. And the longer we delay in addressing the problem, the more we risk being unable to meet our climate objective. CEQA provides a mechanism that is independent of AB 32 through which lead agencies can begin immediately to reduce the climate change-related impacts of the projects that come before them.

What Type of Threshold is Appropriate?

Some have suggested that because of the need for urgent action and the uncertainty of the precise “tipping point” for dangerous climate change, any contribution of GHGs to the atmosphere may be significant – a so-called “zero threshold.”

ARB staff believes that for the project types under consideration, non-zero thresholds can be supported by substantial evidence. ARB staff believes that zero thresholds are not mandated in light of the fact that (1) some level of emissions in the near term and at mid-century is still consistent with climate stabilization and (2) current and anticipated regulations and programs apart from CEQA (e.g., AB 32, the Pavley vehicle regulations, the Renewable Portfolio Standard, the California Solar Initiative, and the commitment to net-zero-energy buildings by 2020 (residential) and 2030 (commercial)) will proliferate and increasingly will reduce the GHG contributions of past, present, and future projects.

But any non-zero threshold must be sufficiently stringent to make substantial contributions to reducing the State’s GHG emissions peak, to causing that peak to occur sooner, and to putting California on track to meet its interim (2020) and long-term (2050) emissions reduction targets. ARB staff believes that the preliminary interim approaches outlined in this Staff Proposal are consistent with these objectives.

RECOMMENDED THRESHOLDS – CONCEPTUAL APPROACH

ARB staff believes that different GHG thresholds of significance may apply to projects in different sectors. Two primary reasons that sector-specific thresholds are appropriate are: (1) some sectors contribute more substantially to the problem, and therefore should have a greater obligation for emissions reductions, and, (2) looking forward, there are differing levels of emissions reductions expected from different sectors in order to meet California’s climate objectives. We also believe that different types of thresholds – quantitative, qualitative, and performance-based – can apply to different sectors under the premise that the sectors can and must be treated separately given the state of the science and data. A sector-specific approach is consistent with ARB’s

²² Health and Safety Code, § 38500, et. seq.

Proposed Scoping Plan. Consequently, the Staff Proposal takes different, although harmonious, approaches to setting thresholds for different sectors.

The attached flowcharts describe ARB staff's preliminary interim threshold concepts for two important sectors: industrial projects (**Attachment A**) and residential and commercial projects (**Attachment B**). The objective is to develop thresholds for projects in these sectors that will result in a substantial portion of the GHG emissions from new projects being subject to CEQA's mitigation requirement, consistent with a lead agency's obligation to "avoid or minimize environmental damage where feasible."²³ ARB staff is working on a proposal for an interim approach for thresholds for transportation projects and large dairies. Electricity generation is another sector where clarity is needed in the near term. The California Energy Commission (CEC) recently began a public process for identifying an approach for assessing the significance of GHG emissions from power plant projects. CEC staff anticipates concluding that work in Spring 2009.²⁴

ARB staff's proposed recommendations for GHG thresholds address projects for which local agencies are typically the CEQA lead agency. In addition to the CEC, other State agencies also serve as lead agencies under CEQA. ARB is coordinating with these State agencies on their approaches to thresholds of significance.

²³ California Code of Regulations, title 14, § 15021.

²⁴ The CEC adopted an Order Instituting Informational Proceeding on October 8, 2008 to address GHG emissions in power plant licensing cases: http://www.energy.ca.gov/ghg_powerplants/notices/2008-10-06_PROPOSED_GHG_CEQA_OII.PDF.

REQUEST FOR PUBLIC COMMENT

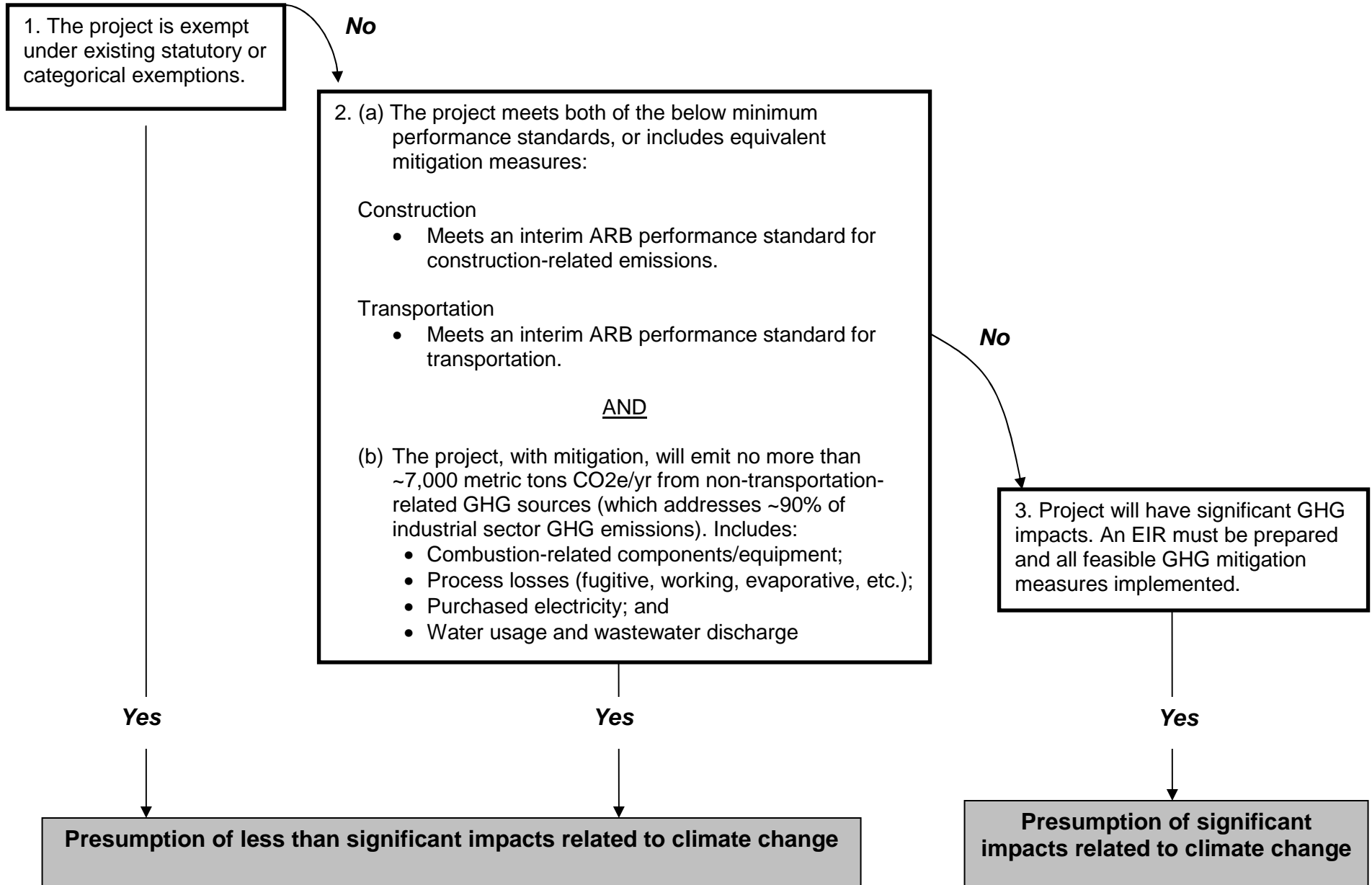
ARB staff believes that the concepts in this Staff Proposal can be further developed into interim thresholds of significance. However, staff recognizes that additional analyses and data are needed to fill in some of the blanks, and to understand how the thresholds will operate in the real world.

Comments on all aspects of the Staff Proposal are encouraged. In particular, ARB seeks the active participation of local lead agencies. Staff has identified a few questions to solicit public comment, but this list is not exhaustive.

- Will the recommended approaches have any unintended consequences, for example, encouraging the piecemealing of projects?
- As set out in the attachments to the Staff Proposal, staff proposes to define certain performance standards (e.g., for energy efficiency) by referencing or compiling lists from existing local, State or national standards. For some sub-sources of GHG emissions (e.g., construction, transportation, waste), ARB staff has not identified reference standards. How should the performance standards for these sub-sources be defined?
- Are any of the industrial, residential, or commercial project types eligible for categorical exemptions likely to contribute more significantly to climate change than staff's preliminary analysis indicates?
- For residential and commercial projects, staff has proposed that the GHG emissions of some projects that meet GHG performance standards might under some circumstances still be considered cumulatively considerable and therefore significant. What types of projects might still have significant climate change-related impacts?

ATTACHMENT A

Preliminary Draft Proposal for Industrial Projects



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Preliminary Draft Proposal for Industrial Projects

Introduction

CEQA guidelines provide that thresholds of significance can be qualitative, quantitative, or in the form of performance standards. ARB staff's objective is to develop a threshold of significance that will result in the vast majority (~90% statewide) of the greenhouse gas (GHG) emissions from new industrial projects being subject to CEQA's requirement to impose feasible mitigation. ARB staff believes this can be accomplished with a threshold that allows small projects to be considered insignificant. ARB staff used existing data for the industrial sector to derive a proposed hybrid threshold. The threshold consists of a quantitative threshold of 7,000 metric tons of CO₂ equivalent per year (MTCO₂e/year) for operational emissions (excluding transportation), and performance standards for construction and transportation emissions.

The goal of this effort is to provide for the mitigation of GHG emissions from industrial projects on a statewide level. Over time, implementation of AB 32 will reduce or mitigate GHG emissions from industrial sources. Once such requirements are in place, they could become the performance standard for industrial projects for CEQA purposes. ARB staff intends to pursue this approach in conjunction with development of the regulatory requirements for industrial sources in the Proposed AB 32 Scoping Plan. Staff is proposing the use of a quantitative significance threshold at least until such time that performance standards, such as AB 32 regulatory requirements, are in place to ensure mitigation of significant impacts of GHG emissions from projects in the industrial sector.

The performance standards are largely self explanatory and similar to the approaches proposed for residential and commercial projects. The method for deriving the quantitative aspect of the threshold warrants further explanation.

Technical foundation for proposed quantitative aspect of the threshold

Based on the available data, ARB staff found that for the industrial sector, small projects – defined as the portion of new projects that, when viewed collectively, were responsible for only a relatively small amount of emissions – could be allowed to proceed without requiring additional mitigation under CEQA. The question for ARB staff was what line divides these small projects from the rest of the projects that should undergo mitigation to achieve the larger environmental objective.

ARB decided to construct a representative small project and to estimate that project's expected emissions. First, ARB considered the common sub-sources of GHG emissions in the industrial sector. The four main broad emission categories and their approximate statewide contribution to GHG emissions from industrial facilities other than power plants are:

Category	MMTCO2e/year	Percent (%)
Combustion processes	70	63 %
Process Losses (evaporative, fugitive, working, etc.)	15	13 %
Purchased Electricity	18	17 %
Water Use and Wastewater Treatment	7	7 %

As the table indicates, GHG emissions from industrial sources are dominated by combustion emissions. To ensure that significant industrial emissions would be captured by the proposed threshold, ARB staff evaluated industrial boilers because they are a very common piece of equipment, are essential in many energy-intensive industries, and are a top contributor to industrial combustion emissions.

A recent comprehensive survey of industrial boilers by Oak Ridge National Laboratory²⁵ found that boilers with an input capacity of 10 MMBtu/hr or greater correspond to 93 percent of total industrial boiler input capacity. Based on this data, ARB staff used a natural gas boiler input capacity benchmark of 10 MMBtu/hr which equates to emissions of 4,660 MTCO2e/yr. This capacity benchmark defines a significant combustion source.

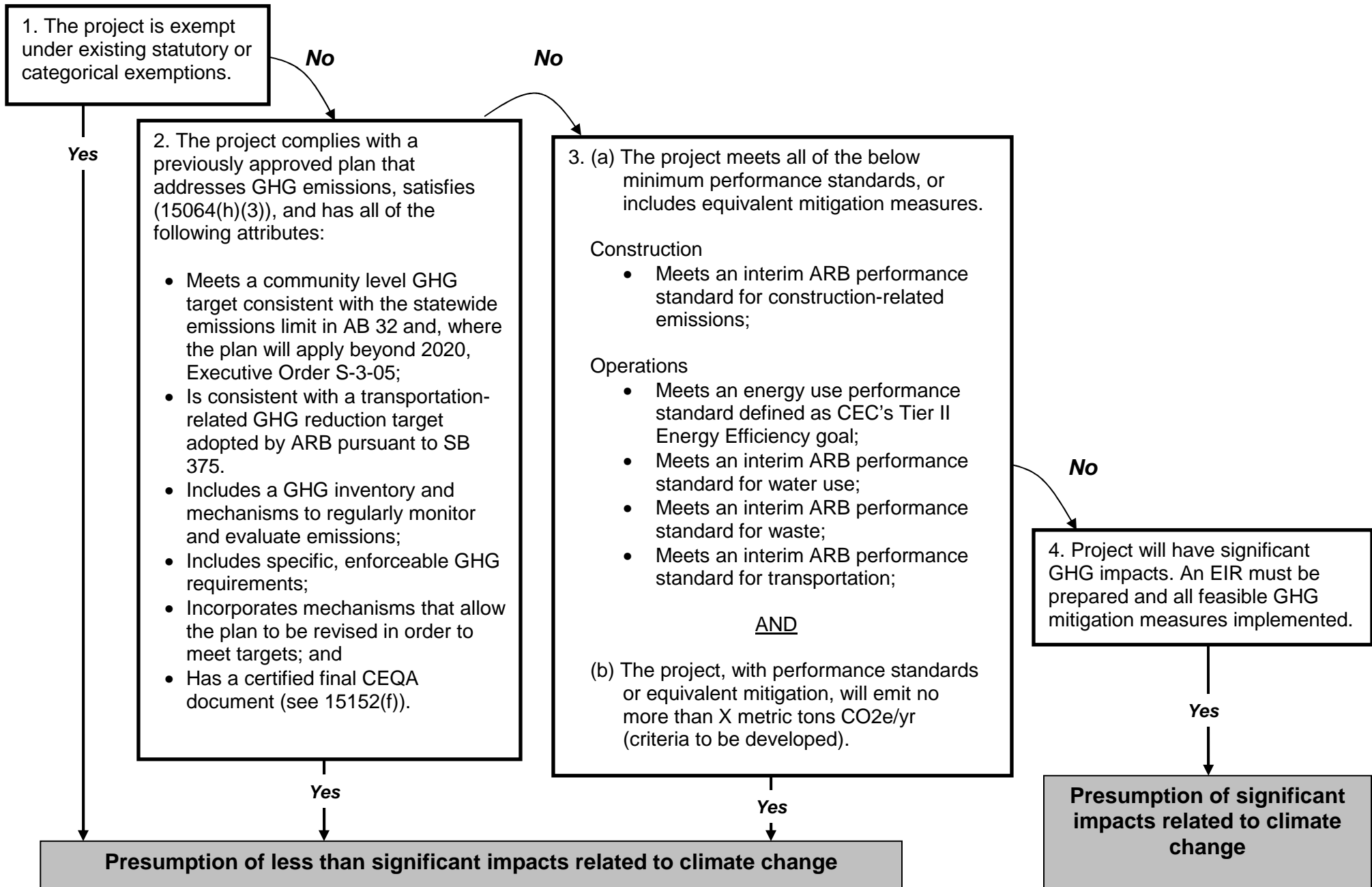
As shown in the above table, combustion processes account for 63 percent of the statewide GHG emissions from industrial facilities. Process losses, purchased electricity, and water use and water treatment account for the remaining 27 percent of emissions. Staff applied these proportions to the benchmark combustion emissions estimate (4,660 MTCO2e/yr). The result is an overall emissions estimate of approximately 7,000 MTCO2e/yr for a representative small project that accounts for the four main categories in the table above.

Based on the available data, staff believes that the 7,000 MTCO2e/year benchmark can be used to effectively mitigate industrial projects with significant GHG emissions.

²⁵ Characterization of the U.S. Industrial/Commercial Boiler Population, Energy, and Environmental Analysis, Inc. submitted to Oak Ridge National Laboratory, available at: http://www.eea-inc.com/natgas_reports/BoilersFinal.pdf.

ATTACHMENT B

Preliminary Draft Proposal for Residential and Commercial Projects



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Preliminary Draft Proposal for Residential and Commercial Projects

Introduction

CEQA guidelines provide that thresholds of significance can be qualitative, quantitative, or in the form of performance standards. ARB staff's objective is to develop a threshold for residential and commercial projects that will substantially reduce the greenhouse gas (GHG) emissions from new projects and streamline the permitting of carbon-efficient projects. To achieve this, staff's preliminary recommendation is to develop a threshold based on clear and stringent performance standards.

Performance standards will address the five major emission sub-sources for the sector: energy use, transportation, water use, waste, and construction. For the energy use performance standard, staff recommends reliance on the California Energy Commission's (CEC) Tier II Energy Efficiency standards for solar energy incentive programs. These standards are consistent with what is needed to meet the state's goal of zero net energy buildings and are continuously updated to reflect energy efficiency best practices. For the remaining sub-sources (water, waste, etc.), staff intends to compile benchmark performance standards as part of its final threshold recommendation. Projects may alternatively incorporate mitigation equivalent to these performance standards.

Staff recognizes that a substantial body of measures to address GHG emissions exists through programs like LEED, GreenPoint Rated, and the California Green Building Code. As work on performance standards moves forward, staff intends to make use of these projects.

In addition, staff proposes that a presumption of non-significance apply only to projects whose total net emissions, after meeting the performance standards or equivalent, are below a specified level. Staff proposes to develop this emissions level as part of its final threshold recommendation.

Discussion of Flow Chart

Box 1: In general, categorical exemptions will continue to apply.

Based on its preliminary analysis, ARB staff believes that projects described in CEQA's categorical and statutory exemption provisions (Articles 18 and 19 of the California Code of Regulations, title 14) will not interfere with achieving the objective to minimize emissions from new projects in this sector. GHG emissions from residential and commercial projects that are described in the categorical exemption language appear to be relatively small from a GHG perspective. For example, staff's preliminary analysis indicates that emissions from a project qualifying for the statutory infill project exemption (Cal. Code Regs., tit. 14, § 15195) will emit approximately 1,600 metric tons (MT)CO₂e/yr. Staff believes

such infill projects represent some of the largest projects described in the exemption provisions. ARB staff expects to provide additional analyses to support a lead agency's determination that the GHG impact of these project types is less than significant. Staff invites the public and stakeholders to provide further evidence on the application of categorical exemptions to residential and commercial projects.

Box 2: If GHGs are adequately addressed at the programmatic level, the impact of certain individual projects can be found to be insignificant.

As OPR noted in its June 2008 Technical Advisory:

CEQA can be a more effective tool for greenhouse gas emissions analysis and mitigation if it is supported and supplemented by sound development policies and practices that will reduce greenhouse gas emissions on a broad planning scale and that can provide the basis for a programmatic approach to project-specific CEQA analysis and mitigation.... For local government lead agencies, adoption of general plan policies and certification of general plan EIRs that analyze broad jurisdiction-wide impacts of greenhouse gas emissions can be part of an effective strategy for addressing cumulative impacts and for streamlining later project-specific CEQA reviews.

ARB staff encourages local agencies to take advantage of a programmatic approach to address climate change, consistent with existing law.

If a project complies with the requirements of a previously adopted GHG emission reduction plan or mitigation program that satisfies California Code of Regulations, title 14, section 15064(h)(3), and includes the attributes specified in that provision and Box 2, the lead agency may determine that the project's GHG impacts are less than significant with no further analysis required. Examples of plans that may satisfy this provision include Climate Action Plans incorporated into General Plans that have inventories, an emissions target, suites of specific and enforceable measures to reach that target, monitoring and reporting, and mechanisms to revise the plan to stay on target. Moreover, a prior EIR that "adequately addressed" climate change may be used for tiering purposes. (See Cal. Code Regs. tit. 14, § 15152.)

Box 3: Projects that meet performance standards, or include equivalent mitigation, can be found to be insignificant.

The threshold incorporates performance standards requiring carbon efficiency for each major sub-source of emissions from projects in these sectors. Provided they are set at a sufficiently stringent level, performance standards will dramatically reduce GHG emissions and promote a transition toward zero and low emission projects. In most cases, ARB staff expects that performance

standards will need to reach beyond current State mandates by a substantial amount, given that GHG emission reduction goals have not yet been adequately incorporated into State programs. Staff anticipates that performance standards will become more stringent over time.

ARB staff has identified the California Energy Commission's Tier II Energy Efficiency goals as an appropriate performance standard for energy use. Under State law, the CEC is required to establish eligibility criteria, conditions for incentives, and rating standards to qualify for ratepayer-funded solar energy system incentives in California. As part of this effort, the CEC establishes energy efficiency standards for homes and commercial structures, and requires new buildings to exceed current building standards by meeting Tier Energy Efficiency goals. CEC's Tier II Energy Efficiency goals will continue to be updated to achieve energy efficiency best practices, and are consistent with what is needed to meet the California Public Utilities Commission Strategic Plan goals of zero net energy buildings. Currently, the CEC's proposed guidelines for the solar energy incentive program recommend a Tier II goal for residential and commercial projects of a 30 percent reduction in building combined space heating, cooling, and water heating energy compared to the 2008 Title 24 Standards.²⁶

For the remaining sub-sources, staff intends to compile benchmark performance standards as part of its final threshold recommendation. ARB staff believes that existing progressive green building standards provide a starting point for performance standards for transportation, water use, waste, and construction-related emissions. Existing green building rating systems like LEED, GreenPoint Rated, the California Green Building Code, and others, contain examples of measures that are likely to result in substantial GHG emission reductions from residential and commercial projects. The key to this approach will be identifying effective GHG reduction measures within these systems. ARB staff would like input from the public and stakeholders on appropriate performance standards for these sub-sources. Performance standards that already exist and have been proven to be effective – at the local, State, national or international level – are preferable.

Under staff's proposed approach, lead agencies would be allowed to find that a project's mitigation is "equivalent" to identified performance standards, thereby allowing for cost-effective and innovative approaches to reducing GHG emissions.

Staff believes that under some circumstances, projects that meet performance standards or include equivalent mitigation measures will have impacts that may still be cumulatively considerable and therefore significant. For this reason, staff recommends that, in addition to meeting performance standards or including

²⁶ [Guidelines for California's Solar Electric Incentive Program Pursuant to Senate Bill 1 - SECOND EDITION - Draft Guidelines](http://www.energy.ca.gov/2008publications/CEC-300-2008-007/CEC-300-2008-007-D.PDF) can be found at:
<http://www.energy.ca.gov/2008publications/CEC-300-2008-007/CEC-300-2008-007-D.PDF>

equivalent mitigation measures, a project must also emit no more than “X” MTCO₂e/yr. Criteria for determining this emissions level have yet to be defined. ARB requests public and stakeholder input on what types of projects might still have significant climate change-related impacts.

Box 4: Presumption of significant impacts.

If a project cannot meet the requirements in the previous boxes, it should be presumed to have significant impacts related to climate change. The lead agency must then prepare an EIR, or other appropriate document, and implement all feasible GHG mitigation measures.



Technical Advisory

CEQA AND CLIMATE CHANGE: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review

This technical advisory is one in a series of advisories provided by the Governor's Office of Planning and Research (OPR) as a service to professional planners, land use officials and CEQA practitioners. OPR issues technical guidance from time to time on issues that broadly affect the practice of CEQA and land use planning. The emerging role of CEQA in addressing climate change and greenhouse gas emissions has been the topic of much discussion and debate in recent months. This document provides OPR's perspective on the issue.

I. PURPOSE

General scientific consensus and increasing public awareness regarding global warming and climate change have placed new focus on the California Environmental Quality Act (CEQA) review process as a means to address the effects of greenhouse gas (GHG) emissions from proposed projects on climate change. Many public agencies—along with academic, business, and community organizations—are striving to determine the appropriate means by which to evaluate and mitigate the impacts of proposed projects on climate change. Approaches and methodologies for calculating GHG emissions and addressing the environmental impacts through CEQA review are rapidly evolving and are increasingly available to assist public agencies to prepare their CEQA documents and make informed decisions.

JUNE 19, 2008

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The Governor's Office of Planning and Research (OPR) will develop, and the California Resources Agency (Resources Agency) will certify and adopt amendments to the Guidelines implementing the California Environmental Quality Act ("CEQA Guidelines"), on or before January 1, 2010, pursuant to Senate Bill 97 (Dutton, 2007). These new CEQA Guidelines will provide regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents. In the interim, OPR offers the following informal guidance regarding the steps lead agencies should take to address climate change in their CEQA documents. This guidance was developed in cooperation with the Resources Agency, the California Environmental Protection Agency (Cal/EPA), and the California Air Resources Board (ARB).

II. BACKGROUND

Climate change refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. Climate change may result from natural factors, natural processes, and human activities that change the composition of the atmosphere and alter the surface and features of the land. Significant changes in global climate patterns have recently been associated with global warming, an average increase in the temperature of the atmosphere near the Earth's surface, attributed to accumulation of GHG emissions in the atmosphere. Greenhouse gases trap heat in the atmosphere, which in turn heats the surface of the Earth. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities. The emission of GHGs through the combustion of fossil fuels (i.e., fuels containing carbon) in conjunction with other human activities, appears to be closely associated with global warming.

State law defines GHG to include the following: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (Health and Safety Code, section 38505(g).) The most common GHG that results from human activity is carbon dioxide, followed by methane and nitrous oxide.

Requirements of AB 32 and SB 97

Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006 (Nunez, 2006), recognizes that California is the source of substantial amounts of GHG emissions. The statute begins with several legislative findings and declarations of intent, including the following:

Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snow pack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems. (Health and Safety Code, section 38501.)

In order to avert these consequences, AB 32 establishes a state goal of reducing GHG emissions to 1990 levels by the year 2020 (a reduction of approximately 25 percent from forecast emission levels) with further reductions to follow. The law requires the ARB to establish a program to track and report GHG emissions; approve a scoping plan for achieving the maximum technologically feasible and cost effective reductions from sources of GHG emissions; adopt early reduction measures to begin moving forward; and adopt, implement and enforce regulations – including market mechanisms such as “cap-and-trade” programs – to ensure the required reductions occur. The ARB recently adopted a statewide GHG emissions limit and an emissions inventory, along with requirements to measure, track, and report GHG emissions by the industries it determined to be significant sources of GHG emissions.

CEQA requires public agencies to identify the potentially significant effects on the environment of projects they intend to carry out or approve, and to mitigate significant effects whenever it is feasible to do so. While AB 32 did not amend CEQA to require new analytic processes to account for the environmental impacts of GHG emissions from projects subject to CEQA, it does acknowledge that such emissions cause significant adverse impacts to human health and the environment.

Senate Bill 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directs OPR to develop draft CEQA Guidelines “for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions” by July 1, 2009 and directs the Resources Agency to certify and adopt the CEQA Guidelines by January 1, 2010.

Requirements of CEQA

CEQA is a public disclosure law that requires public agencies to make a

good-faith, reasoned effort, based upon available information, to identify the potentially significant direct and indirect environmental impacts—including cumulative impacts— of a proposed project or activity. The CEQA process is intended to inform the public of the potential environmental effects of proposed government decisions and to encourage informed decision-making by public agencies. In addition, CEQA obligates public agencies to consider less environmentally-damaging alternatives and adopt feasible mitigation measures to reduce or avoid a project's significant impacts.

The lead agency is required to prepare an Environmental Impact Report (EIR), a Mitigated Negative Declaration, or equivalent document, when it determines that the project's impacts on the environment are potentially significant. This determination of significance must be based upon substantial evidence in light of all the information before the agency.

Although the CEQA Guidelines, at Appendix G, provide a checklist of suggested issues that should be addressed in an EIR, neither the CEQA statute nor the CEQA Guidelines prescribe thresholds of significance or particular methodologies for performing an impact analysis. This is left to lead agency judgment and discretion, based upon factual data and guidance from regulatory agencies and other sources where available and applicable. A threshold of significance is essentially a regulatory standard or set of criteria that represent the level at which a lead agency finds a particular environmental effect of a project to be significant. Compliance with a given threshold means the effect normally will be considered less than significant. Public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact.

We realize that perhaps the most difficult part of the climate change analysis will be the determination of significance. Although lead agencies typically rely on local or regional definitions of significance for most environmental issues, the global nature of climate change warrants investigation of a statewide threshold of significance for GHG emissions. To this end, OPR has asked ARB technical staff to recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state. Until such time as state guidance is available on thresholds of significance for GHG emissions, we recommend the following approach to your CEQA analysis.

III. RECOMMENDED APPROACH

Each public agency that is a lead agency for complying with CEQA needs to develop its own approach to performing a climate change analysis for projects that generate GHG emissions. A consistent approach should be applied for the analysis of all such projects, and the analysis must be based on best available information. For these projects, compliance with CEQA entails three basic steps: identify and quantify the GHG emissions; assess the significance of the impact on climate change; and if the impact is found to be significant, identify alternatives and/or mitigation measures that will reduce the impact below significance.

Lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source. Second, the lead agency must assess whether those emissions are individually or cumulatively significant. When assessing whether a project's effects on climate change are "cumulatively considerable" even though its GHG contribution may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions. Although the scientific knowledge and understanding of how best to perform this analysis is rudimentary and still evolving, many useful resources are available (see Attachment 1).

Until such time as further state guidance is available on thresholds of significance, public agencies should consider the following general factors when analyzing whether a proposed project has the potential to cause a significant climate change impact on the environment.

Identify GHG Emissions

- Lead agencies should make a good-faith effort, based on available information, to calculate, model, or estimate the amount of CO₂ and other GHG emissions from a project, including the emissions associated with vehicular traffic, energy consumption, water usage and construction activities.
- Technical resources, including a variety of modeling tools, are available to assist public agencies to quantify GHG emissions. OPR recognizes that more sophisticated emissions models for particular types of projects are continually being developed and that the state-of-the-art quantification

models are rapidly changing. OPR will periodically update the examples of modeling tools identified in Attachment 2.

- There is no standard format for including the analysis in a CEQA document. A GHG/climate change analysis can be included in one or more of the typical sections of an EIR (e.g., air quality, transportation, energy) or may be provided in a separate section on cumulative impacts or climate change.

Determine Significance

- When assessing a project's GHG emissions, lead agencies must describe the existing environmental conditions or setting, without the project, which normally constitutes the baseline physical conditions for determining whether a project's impacts are significant.
- As with any environmental impact, lead agencies must determine what constitutes a significant impact. In the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a "significant impact", individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice.
- The potential effects of a project may be individually limited but cumulatively considerable. Lead agencies should not dismiss a proposed project's direct and/or indirect climate change impacts without careful consideration, supported by substantial evidence. Documentation of available information and analysis should be provided for any project that may significantly contribute new GHG emissions, either individually or cumulatively, directly or indirectly (e.g., transportation impacts).
- Although climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment. CEQA authorizes reliance on previously approved plans and mitigation programs that have adequately analyzed and mitigated GHG emissions to a less than significant level as a means to avoid or substantially reduce the cumulative impact of a project.

Mitigate Impacts

- Mitigation measures will vary with the type of project being contemplated, but may include alternative project designs or locations that conserve energy and water, measures that reduce vehicle miles traveled

(VMT) by fossil-fueled vehicles, measures that contribute to established regional or programmatic mitigation strategies, and measures that sequester carbon to offset the emissions from the project.

- The lead agency must impose all mitigation measures that are necessary to reduce GHG emissions to a less than significant level. CEQA does not require mitigation measures that are infeasible for specific legal, economic, technological, or other reasons. A lead agency is not responsible for wholly eliminating all GHG emissions from a project; the CEQA standard is to mitigate to a level that is “less than significant”.
- If there are not sufficient mitigation measures that the lead agency determines are feasible to achieve the less than significant level, the lead agency should adopt those measures that are feasible, and adopt a Statement of Overriding Considerations that explains why further mitigation is not feasible. A Statement of Overriding Considerations must be prepared when the lead agency has determined to approve a project for which certain impacts are unavoidable. These statements should explain the reasons why the impacts cannot be adequately mitigated in sufficient detail, and must be based on specific facts, so as not to be conclusory.
- Agencies are encouraged to develop standard GHG emission reduction or mitigation measures that can be applied on a project-by-project basis. Attachment 3 contains a preliminary menu of measures that lead agencies may wish to consider. This list is by no means exhaustive or prescriptive. Lead agencies are encouraged to develop their own measures and/or propose project alternatives to reduce GHG emissions, either at a programmatic level or on a case-by-case review.
- In some cases GHG emission reduction measures will not be feasible or may not be effective at a project level. Rather, it may be more appropriate and more effective to develop and adopt program-level plans, policies and measures that will result in a reduction of GHG emissions on a regional level.

IV. ADDITIONAL LAND USE CONSIDERATIONS

CEQA can be a more effective tool for GHG emissions analysis and mitigation if it is supported and supplemented by sound development policies and practices that will reduce GHG emissions on a broad planning scale and that can provide the basis for a programmatic approach to project-specific CEQA analysis and mitigation.

Local governments with land use authority are beginning to establish policies that result in land use patterns and practices that will result in less energy use and reduce GHG emissions. For example, some cities and counties have adopted general plans and policies that encourage the development of compact, mixed-use, transit-oriented development that reduces VMT; encourage alternative fuel vehicle use; conserve energy and water usage; and promote carbon sequestration. Models of such developments exist throughout the state (see OPR climate change website for examples of city and county plans and policies, referenced in Attachment 1).

For local government lead agencies, adoption of general plan policies and certification of general plan EIRs that analyze broad jurisdiction-wide impacts of GHG emissions can be part of an effective strategy for addressing cumulative impacts and for streamlining later project-specific CEQA reviews.

International, national, and statewide organizations such as ICLEI (Local Governments for Sustainability), the Cities for Climate Protection, and the Clean Cities Coalition—to name just a few—have published guidebooks to help local governments reduce GHG emissions through land use planning techniques and improved municipal operations. Links to these resources are provided at the end of this advisory.

Regional agencies can also employ a variety of strategies to reduce GHG emissions through their planning processes. For example, regional transportation planning agencies adopt plans and programs that address congestion relief, jobs-to-housing balance, reduction of vehicle miles traveled (VMT), and other issues that have implications for GHG emission reductions.

State agencies are also tackling the issue of climate change. Some have adopted or support policies and programs that take climate change into account, including the Department of Water Resources' State Water Plan; the Department of Transportation's State Transportation Plan; and the Business, Housing and Transportation Agency's Regional Blueprint Planning Program. These efforts not only raise public awareness of climate change and how the State can reduce GHG emissions, but also offer specific information and resources for lead agencies to consider.

V. NEXT STEPS

OPR has asked ARB technical staff to recommend a method for setting a threshold of significance for GHG emissions. OPR has requested that the ARB identify a range of feasible options, including qualitative and quantitative options.

OPR is actively seeking input from the public and stakeholder groups, as it develops draft CEQA Guidelines for GHG emissions. OPR is engaged with the Resources Agency and other expert state agencies, local governments, builders and developers, environmental organizations, and others with expertise or an interest in the development of the Guidelines.

OPR will conduct public workshops later this year to receive input on the scope and content of the CEQA Guidelines amendments. It is OPR's intent to release a preliminary draft of the CEQA Guidelines amendments for public review and comment in the fall. This will enable OPR to deliver a proposed package of CEQA Guidelines amendments to the Resources Agency as early as January 2009, well before the statutory due date of July 1, 2009.

We encourage public agencies and the public to refer to the OPR website at www.opr.ca.gov for information about the CEQA Guidelines development process and to subscribe to OPR's notification system for announcements and updates.

For more information about this technical advisory and assistance in addressing the impacts of GHG emissions on the environment, please contact:

Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street
P.O. Box 3044
Sacramento, CA 95812-3044
Telephone: (916) 445-0613
Fax: (916) 323-3018
Web Address: www.opr.ca.gov

ATTACHMENTS

1. References and Information Sources
2. Technical Resources/Modeling Tools to Estimate GHG Emissions
3. Examples of GHG Reduction Measures

Attachment 1

References and Information Sources

The following is a list of websites of organizations that can offer additional information regarding methods to characterize, quantify, assess and reduce GHG emissions. In addition, a list of useful resources and reference materials is provided on the subject of climate change and greenhouse gases.

ORGANIZATIONS

- Governor's Office of Planning and Research
<http://www.opr.ca.gov>
- California Climate Action Team
http://www.climatechange.ca.gov/climate_action_team/
- California Climate Change Portal
<http://www.climatechange.ca.gov>
- California Air Resources Board Climate Change Website
<http://www.arb.ca.gov/cc/cc.htm>
- California Climate Action Registry
<http://www.climateregistry.org/>
- California Department of Water Resources, Climate Change and California Water Plan Website
<http://www.waterplan.water.ca.gov/climate/>
- California Energy Commission Climate Change Proceedings
http://www.energy.ca.gov/global_climate_change/index.html
- California Public Utilities Commission, Climate Change Website
http://www.cpuc.ca.gov/static/energy/electric/climate+change/_index.htm
- Green California Website
<http://www.green.ca.gov/default.htm>
- Western Climate Initiative
<http://www.westernclimateinitiative.org>

- California Air Pollution Control Officers Association
<http://www.capcoa.org>
- Local Governments for Sustainability (ICLEI)
<http://www.iclei.org/>
- ICLEI Cities for Climate Protection (CCP)
<http://www.iclei.org/index.php?id=800>
- United Nations Framework Convention on Climate Change
<http://unfccc.int/2860.php>
- Intergovernmental Panel on Climate Change
<http://www.ipcc.ch>
- United States Environmental Protection Agency
<http://www.epa.gov/climatechange/>
- City of Seattle U.S. Mayors Climate Protection Agreement
<http://www.seattle.gov/mayor/climate/>
- Mayors for Climate Protection
<http://www.coolmayors.com>
- U.S. Conference of Mayors Climate Protection Web Page
<http://usmayors.org/climateprotection>
- Institute for Local Government California Climate Action Network
<http://www.ca-ilg.org/climatechange>

STATUTES, REGULATIONS, AND EXECUTIVE ORDERS

- SB 97
http://opr.ca.gov/ceqa/pdfs/SB_97_bill_20070824_chaptered.pdf
- SB 97 Governor's Signing Message
<http://opr.ca.gov/ceqa/pdfs/SB-97-signing-message.pdf>
- AB 32
http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf
- AB 1493
http://www.leginfo.ca.gov/pub/01-02/bill/asm/ab_1451-1500/ab_1493_bill_20020722_chaptered.pdf

- Regulations implementing AB 1493
<http://www.arb.ca.gov/regact/grnhsgas/revfro.pdf> and <http://www.arb.ca.gov/regact/grnhsgas/revtp.pdf>
- SB 1368
http://www.leginfo.ca.gov/pub/05-06/bill/sen/sb_1351-1400/sb_1368_bill_20060929_chaptered.pdf
- Executive Order S-01-07 regarding low carbon standard for transportation fuels
<http://gov.ca.gov/index.php?/executive-order/5172/>
- Executive Order S-20-06 regarding implementation of AB 32
<http://gov.ca.gov/index.php?/executive-order/4484/>
- Executive Order S-3-05 regarding greenhouse gas goals
<http://gov.ca.gov/index.php?/executive-order/1861/>
- Executive Order S-20-04 regarding energy conservation by state
<http://gov.ca.gov/index.php?/executive-order/3360/>

REPORTS

- OPR List of Environmental Documents Addressing Climate Change
http://opr.ca.gov/ceqa/pdfs/Environmental_Assessment_Climate_Change.pdf
- OPR List of Local Plans Addressing Climate Change
http://opr.ca.gov/ceqa/pdfs/City_and_County_Plans_Addressing_Climate_Change.pdf
- *Climate Action Team Proposed Early Action Measures to Mitigate Climate Change in California*, April 2007
http://www.climatechange.ca.gov/climate_action_team/reports/2007-04-20_CAT_REPORT.PDF
- California Air Resources Board, *Early Action Items to Mitigate Climate Change in California*, October 2007
http://www.arb.ca.gov/cc/ccea/meetings/ea_final_report.pdf
- California Air Resourced Board, *Draft Greenhouse Gas Inventory*, November 2007
http://www.arb.ca.gov/cc/inventory/data/tables/rpt_Inventory_IPCC_All_2007-11-19.pdf
- *Climate Action Team Report to the Governor and Legislature*, March 2006,
http://www.climatechange.ca.gov/climate_action_team/reports/index.html

- California Climate Change Center, *Our Changing Planet: Assessing the Risks to California - Summary Report*
<http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF>
Detailed reports available at: http://www.climatechange.ca.gov/biennial_reports/2006report/index.html
- California Energy Commission, *2007 Integrated Energy Policy Report Update*
<http://www.energy.ca.gov/2007publications/CEC-100-2007-008/CEC-100-2007-008-CMF.PDF>
- California Department of Water Resources, *Progress on Incorporating Climate Change into Management of California's Water Resources*
<http://baydeltaoffice.water.ca.gov/climatechange/DWRClimateChangeJuly06.pdf> - pagemode=bookmarks&page=1
- *Climate Action Program at Caltrans*, December 2006
<http://www.dot.ca.gov/docs/ClimateReport.pdf>
- California Air Pollution Control Officers Association, *CEQA & Climate Change*, January 2008
<http://www.capcoa.org/ceqa/CAPCOA%20White%20Paper%20-%20CEQA%20and%20Climate%20Change.pdf>
- West Coast Governors' Global Warming Initiative, November 2004
http://www.climatechange.ca.gov/westcoast/documents/2004-11_final_report/2004-11-18_STAFF_RECOMMENDS.PDF
- Western Climate Initiative Work Plan, October 2007
<http://www.westernclimateinitiative.org/ewebeditpro/items/O104F13792.pdf>
- California Climate Change Center, University of California at Berkeley, *Managing Greenhouse Gas Emissions in California*, 2007
http://calclimate.berkeley.edu/managing_GHGs_in_CA.html
- U.S. Conference of Mayors, *Energy & Environment Best Practices*
<http://www.usmayors.org/climateprotection/AtlantaEESummitCDROMVersion.pdf>
- *U.S. Mayors Climate Protection Agreement Climate Action Handbook*, 2006
<http://www.seattle.gov/climate/docs/ClimateActionHandbook.pdf>
- Natural Capitalism Solutions *Climate Protection Manual for Cities*, June 2007
<http://www.climatemanual.org>

- National Governor's Association Center for Best Practices *Growing with Less Greenhouse Gases*, November 2002
<http://www.nga.org/cda/files/112002ghg.pdf>
- National Governor's Association Center for Best Practices *State and Regional Greenhouse Gas Initiatives*, October 2006
<http://www.nga.org/Files/pdf/0610GREENHOUSE.PDF>
- United States Climate Change Program *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States*, May 2008
http://www.usda.gov/oce/global_change/sap_2007_FinalReport.htm

Attachment 2

Technical Resources/Modeling Tools to Estimate GHG Emissions

TOOL	AVAILABILITY	SCOPE LOCAL/ REGIONAL	SCOPE TRANSPORTATION/ BUILDINGS	DATA INPUT REQUIREMENTS	DATA OUTPUT
URBEMIS	<ul style="list-style-type: none"> Download Public domain (free) 	<ul style="list-style-type: none"> Local project level 	<ul style="list-style-type: none"> Transportation Some building (area source) outputs Construction 	<ul style="list-style-type: none"> Land use information Construction, area source, and transportation assumptions 	<ul style="list-style-type: none"> CO₂ (pounds per day) Mitigation impacts
Clean Air and Climate Protection (CACP) Software	<ul style="list-style-type: none"> Download Available to public agencies (free) 	<ul style="list-style-type: none"> Local project level 	<ul style="list-style-type: none"> Buildings Communities Governments 	<ul style="list-style-type: none"> Energy usage Waste generation and disposal Transportation fuel usage or VMT 	<ul style="list-style-type: none"> CO₂e (tons per year)
Sustainable Communities Model (SCM)	<ul style="list-style-type: none"> Custom model 	<ul style="list-style-type: none"> Regional Scalable to site level 	<ul style="list-style-type: none"> Transportation Buildings Neighborhoods Master planned communities 	<ul style="list-style-type: none"> Location and site specific information Transportation assumptions On-site energy usage 	<ul style="list-style-type: none"> CO₂e (tons per year)
Internet-accessed Planning for Community Energy, Economic and Environmental Sustainability I-PLACE³S	<ul style="list-style-type: none"> Web-based Small access fee Full model now available in eight CA counties 	<ul style="list-style-type: none"> Regional Scalable to site level 	<ul style="list-style-type: none"> Transportation Housing Land Use Buildings Energy Economics 	<ul style="list-style-type: none"> Parcel level land use data (ability to work with less data) Project-level data for alternative comparisons 	<ul style="list-style-type: none"> CO₂ (any quantity over any time)
Climate Action Registry Reporting On-Line Tool (CARROT)	<ul style="list-style-type: none"> Web-based Available to Registry members General public can view entity reports 	<ul style="list-style-type: none"> Regional, scalable to entity and facility level 	<ul style="list-style-type: none"> General Reporting and Certification Protocols <ul style="list-style-type: none"> Transportation Buildings/facilities Specific protocols for some sectors 	<ul style="list-style-type: none"> Mobile source combustion (VMT or fuel usage) Stationary combustion (fuel usage) Indirect emissions (electricity usage) 	<ul style="list-style-type: none"> Each GHG and CO₂e (tons per year)
EMFAC	<ul style="list-style-type: none"> Download Public domain (free) 	<ul style="list-style-type: none"> Statewide Regional (air basin level) 	<ul style="list-style-type: none"> Transportation emission factors 	<ul style="list-style-type: none"> Travel activity data to calculate CO₂ from projects. 	<ul style="list-style-type: none"> CO₂ and methane (grams per mile) emission factors

VMT = Vehicle miles traveled

eCO₂ = Carbon dioxide equivalent emissions

Note: This is not meant to be a definitive list of modeling tools to estimate climate change emissions impacts. Other tools may be available.

Description of Modeling Tools

URBEMIS

The Urban Emissions Model is used extensively during the CEQA process by local air districts and consultants to determine the impacts of projects on criteria pollutants. It was recently updated to calculate CO₂ emissions as well. Future updates will include additional greenhouse gases. URBEMIS uses the ITE Trip Generation Rate Manual and the Air Resources Board's (ARB) motor vehicle emissions model (EMFAC) to calculate transportation-related CO₂ emissions and ARB's OFFROAD2007 model for CO₂ emissions from off-road equipment. Area source outputs include natural gas use, landscaping equipment, consumer products, architectural coatings, and fireplaces. It also estimates construction impacts and impacts of mitigation options. Web site: <http://www.urbemis.com>.

Clean Air and Climate Protection (CACP) Software

This tool is available to state and local governments and members of ICLEI, NACAA, NASEO and NARUC to determine greenhouse gas and criteria pollutant emissions from government operations and communities as a whole. The user must input aggregate information about energy (usage), waste (quantity and type generated, disposal method, and methane recovery rate) and transportation (VMT) for community analyses. CACP uses emission factors from EPA, DOE, and DOT to translate the energy, waste and transportation inputs into greenhouse gas (in carbon dioxide equivalents) and criteria air pollutant emissions. If associated energy, waste and transportation reduction are provided, the model can also calculate emission reductions and money saved from policy alternatives. Web site: <http://cacpsoftware.org>.

Sustainable Communities Model (SCM)

This model quantifies total CO₂e emissions allowing communities the ability to optimize planning decisions that result in the greatest environmental benefit for the least cost. Total CO₂e emissions are based on emissions from energy usage, water consumption and transportation. The model provides an interactive comparison of various scenarios to provide environmental performance, economic performance, and cost benefit analysis.

Web site: www.ctg-net.com/energetics/documents/doc_SCM_070731.pdf

I-PLACE³S

This model is an internet-accessed land use and transportation model designed specifically for regional and local governments to help understand how their growth and development decisions can contribute to improved sustainability. It estimates CO₂, criteria pollutant and energy impacts on a neighborhood or

regional level for existing, long-term baseline and alternative land use plans. The data input requirements are extensive and require a fiscal commitment from the Metropolitan Planning Organization and its member local governments. Once the data is available, the IPLACES tool can be developed for that region relatively quickly, in approximately one week. The benefits include a multifunctional tool that provides immediate outputs to compare alternatives during public meetings, multilevel password protected on-line access, as well as providing access for local development project CEQA analyses. This tool also supports regional travel models and integrated land use and transportation assessments. Web site: http://www.sacregionblueprint.org/sacregionblueprint/the_project/technology.cfm and <http://www.places.energy.ca.gov/places>

CARROT

The California Climate Action Registry offers the Climate Action Registry Reporting On-Line Tool (CARROT) for Registry members to calculate and report annual greenhouse gas (GHG) emissions. CARROT calculates direct and indirect GHG emissions for the following emission categories by source: stationary combustion, process emissions, mobile source combustion, fugitive emissions and electricity use by source. It calculates emissions using entity collected data such as fuel purchase records, VMT and utility bills. While reporting and certification through CARROT is only available to members, the public may access entity reports online. Reporting protocols are also available to the public, including the General Reporting Protocol (www.climateregistry.org/docs/PROTOCOLS/GRP%20V2-March2007_web.pdf) and cement, forestry and power/utility sector protocols. Additional sector protocols are under development. Website: www.climateregistry.org/CARROT/

EMFAC

The Air Resources Board's EMISSION FACTors (EMFAC) model is used to calculate emission rates from all motor vehicles in California. The emission factors are combined with data on vehicle activity (miles traveled and average speeds) to assess emission impacts. The URBEMIS model described above uses EMFAC to calculate the transportation emission impacts of local projects. Web site: <http://www.arb.ca.gov/msei/onroad/onroad.htm>

Attachment 3

Examples of GHG Reduction Measures

The following are examples of measures that have been employed by some public agencies to reduce greenhouse gas emissions, either as general development policies or on a project-by-project basis. These are provided for illustrative purposes only.

LAND USE AND TRANSPORTATION

- Implement land use strategies to encourage jobs/housing proximity, promote transit-oriented development, and encourage high density development along transit corridors. Encourage compact, mixed-use projects, forming urban villages designed to maximize affordable housing and encourage walking, bicycling and the use of public transit systems.
- Encourage infill, redevelopment, and higher density development, whether in incorporated or unincorporated settings
- Encourage new developments to integrate housing, civic and retail amenities (jobs, schools, parks, shopping opportunities) to help reduce VMT resulting from discretionary automobile trips.
- Apply advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods and services.
- Incorporate features into project design that would accommodate the supply of frequent, reliable and convenient public transit.
- Implement street improvements that are designed to relieve pressure on a region's most congested roadways and intersections.
- Limit idling time for commercial vehicles, including delivery and construction vehicles.

URBAN FORESTRY

- Plant trees and vegetation near structures to shade buildings and reduce energy requirements for heating/cooling.
- Preserve or replace onsite trees (that are removed due to development) as a means of providing carbon storage.

GREEN BUILDINGS

- Encourage public and private construction of LEED (Leadership in Energy and Environmental Design) certified (or equivalent) buildings.

ENERGY CONSERVATION POLICIES AND ACTIONS

- Recognize and promote energy saving measures beyond Title 24 requirements for residential and commercial projects
- Where feasible, include in new buildings facilities to support the use of low/zero carbon fueled vehicles, such as the charging of electric vehicles from green electricity sources.
- Educate the public, schools, other jurisdictions, professional associations, business and industry about reducing GHG emissions.
- Replace traffic lights, street lights, and other electrical uses to energy efficient bulbs and appliances.
- Purchase Energy Star equipment and appliances for public agency use.
- Incorporate on-site renewable energy production, including installation of photovoltaic cells or other solar options.
- Execute an Energy Savings Performance Contract with a private entity to retrofit public buildings. This type of contract allows the private entity to fund all energy improvements in exchange for a share of the energy savings over a period of time.
- Design, build, and operate schools that meet the Collaborative for High Performance Schools (CHPS) best practices.
- Retrofit municipal water and wastewater systems with energy efficient motors, pumps and other equipment, and recover wastewater treatment methane for energy production.
- Convert landfill gas into energy sources for use in fueling vehicles, operating equipment, and heating buildings.
- Purchase government vehicles and buses that use alternative fuels or technology, such as electric hybrids, biodiesel, and ethanol. Where feasible, require fleet vehicles to be low emission vehicles. Promote the use of these vehicles in the general community.
- Offer government incentives to private businesses for developing buildings with energy and water efficient features and recycled materials. The incentives can include expedited plan checks and reduced permit fees.
- Offer rebates and low-interest loans to residents that make energy-saving improvements on their homes.

- Create bicycle lanes and walking paths directed to the location of schools, parks and other destination points.

PROGRAMS TO REDUCE VEHICLE MILES TRAVELED

- Offer government employees financial incentives to carpool, use public transportation, or use other modes of travel for daily commutes.
- Encourage large businesses to develop commute trip reduction plans that encourage employees who commute alone to consider alternative transportation modes.
- Develop shuttle systems around business district parking garages to reduce congestion and create shorter commutes.
- Create an online ridesharing program that matches potential carpoolers immediately through email.
- Develop a Safe Routes to School program that allows and promotes bicycling and walking to school.

PROGRAMS TO REDUCE SOLID WASTE

- Create incentives to increase recycling and reduce generation of solid waste by residential users.
- Implement a Construction and Demolition Waste Recycling Ordinance to reduce the solid waste created by new development.
- Add residential/commercial food waste collection to existing greenwaste collection programs.



CEQA & Climate Change

Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act

January 2008

Disclaimer

The California Air Pollution Control Officers Association (CAPCOA) has prepared this white paper consideration of evaluating and addressing greenhouse gas emissions under the California Environmental Quality Act (CEQA) to provide a common platform of information and tools to support local governments.

This paper is intended as a resource, not a guidance document. It is not intended, and should not be interpreted, to dictate the manner in which an air district or lead agency chooses to address greenhouse gas emissions in the context of its review of projects under CEQA.

This paper has been prepared at a time when California law has been recently amended by the Global Warming Solutions Act of 2006 (AB 32), and the full programmatic implications of this new law are not yet fully understood. There is also pending litigation in various state and federal courts pertaining to the issue of greenhouse gas emissions. Further, there is active federal legislation on the subject of climate change, and international agreements are being negotiated. Many legal and policy questions remain unsettled, including the requirements of CEQA in the context of greenhouse gas emissions. This paper is provided as a resource for local policy and decision makers to enable them to make the best decisions they can in the face of incomplete information during a period of change.

Finally, this white paper reviews requirements and discusses policy options, but it 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, or requests for advice should be directed to the agency's legal counsel.

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Table 18 – Rule and Regulation Summary	C-1

List of Acronyms and Abbreviations

<u>Acronym/ Abbreviation</u>	<u>Meaning</u>
AB 32	Assembly Bill 32 Global Warming Solutions Act of 2006
AG	Attorney General
ARB	Air Resources Board
ASTM	American Society of Testing and Material
BAAQMD	Bay Area Air Quality Management District
BAU	Business as Usual
BEES	Building for Environmental and Economic Sustainability
Calfire	California Fire
Caltrans	California Department of Transportation
CAP	Criteria Air Pollutants
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resource Board
CAT	Climate Action Team
CCAP	Center for Clean Air Policy
CCAR	California Climate Action Registry
CDFA	California Department of Food and Agriculture
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CF	Connectivity Factor
CH ₄	Methane
CIWMB	California Integrated Waste Management Board
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CNG	Compressed Natural Gas
CPUC	California Public Utilities Commission
CUFR	California Urban Forestry
DGS	Department of General Services
DOE	U.S. Department of Energy
DOF	Department of Finance
DPF	Diesel Particulate Filter
DWR	Department of Water Resources
E85	85% Ethanol
EEA	Massachusetts Executive Office of Energy and Environmental Affairs
EERE	Energy Efficiency and Renewable Energy
EIR	Environmental Impact Report
EOE	Encyclopedia of Earth
EPA	U.S. Environmental Protection Agency
ETC	Edmonton Trolley Coalition
EV	Electric Vehicles
FAR	Floor Area Ratio

GHG	Greenhouse Gas
GGEP	Greenhouse Gas Emissions Policy
GGRP	Greenhouse Gas Reduction Plan
GP	General Plan
GWP	Global Warming Potential
IGCC	Integrated Gasification Combined Cycle
IOU	Investor Owned Utility
IPCC	International Panel on Climate Change
IT	Information Technology
ITE	Institute of Transportation Engineers
J&S	Jones & Stokes
km	Kilometer
LandGem	Landfill Gas Emissions Model
LEED	Leadership in Energy and Environmental Design
LNG	Liquefied Natural Gas
MBUAPCD	Monterey Bay Unified Air Pollution Control District
MEPA	Massachusetts Environmental Policy Act
MND	Mitigated Negative Declaration
MMT CO ₂ e	Million Metric Tons Carbon Dioxide Equivalent
MW	Megawatts
N ₂ O	Nitrous Oxide
NACAA	National Association Clean Air Agencies
ND	Negative Declaration
NEV	Neighborhood Electric Vehicle
NIST	National Institute of Standards and Technology
NO _x	Oxides of Nitrogen
NREL	National Renewable Energy Laboratory
NSCAPCD	Northern Sonoma County Air Pollution Control District
NSR	New Source Review
OPR	State Office of Planning and Research
PFC	Perfluorocarbon
PG&E	Pacific Gas & Electric
POU	Publicly Owned Utility
PM	Particulate Mater
RoadMod	Road Construction Emissions Model
ROG	Reactive Organic Gas
RPS	Renewable Portfolio Standards
RTP	Regional Transportation Plan
S-3-05	Executive Order S-3-05
SB	Senate Bill
SBCAPCD	Santa Barbara County Air Pollution Control District
SCAQMD	South Coast Air Quality Management District
SCM	Sustainable Communities Model
SIP	State Implementation Plan
SJVAPCD	San Joaquin Valley Unified Air Pollution Control District
SLOCAPCD	San Luis Obispo County Air Pollution Control District

SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utilities District
SO _x	Sulfur Oxides
SP	Service Population
SRI	Solar Reflectance Index
SWP	State Water Project
TAC	Toxic Air Contaminants
TBD	To Be Determined
TDM	Transportation Demand Management
TMA	Transportation Management Association
THC	Total Hydrocarbon
UC	University of California
ULEV	Ultra Low Emission Vehicle
UNFCCC	United Nations Framework Convention on Climate Change
URBEMIS	Urban Emissions Model
USGBC	U.S. Green Building Council
VMT	Vehicle Miles Traveled
VTPI	Victoria Transit Policy
YSAQMD	Yolo-Solano Air Quality Management District

Introduction

The California Environmental Quality Act (CEQA) requires that public agencies refrain from approving projects with significant adverse environmental impacts if there are feasible alternatives or mitigation measures that can substantially reduce or avoid those impacts. There is growing concern about greenhouse gas emissions¹ (GHG) and recognition of their significant adverse impacts on the world's climate and on our environment. In its most recent reports, the International Panel on Climate Change (IPCC) has called the evidence for this "unequivocal." In California, the passage of the Global Warming Solutions Act of 2006 (AB 32) recognizes the serious threat to the "economic well-being, public health, natural resources, and the environment of California" resulting from global warming. In light of our current understanding of these impacts, public agencies approving projects subject to the CEQA are facing increasing pressure to identify and address potential significant impacts due to GHG emissions. Entities acting as lead agencies in the CEQA process are looking for guidance on how to adequately address the potential climate change impacts in meeting their CEQA obligations.



Air districts have traditionally provided guidance to local lead agencies on evaluating and addressing air pollution impacts from projects subject to CEQA. Recognizing the need for a common platform of information and tools to support decision makers as they establish policies and programs for GHG and CEQA, the California Air Pollution Control Officers Association has prepared a white paper reviewing policy choices, analytical tools, and mitigation strategies.

This paper is intended to serve as a resource for public agencies as they establish agency procedures for reviewing GHG emissions from projects under CEQA. It considers the application of thresholds and offers three alternative programmatic approaches toward

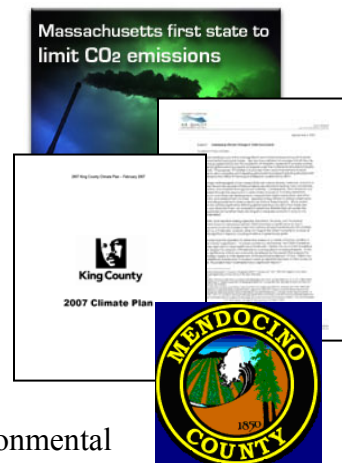
¹ Throughout this paper GHG, CO₂, CO₂e, are used interchangeably and refer generally to greenhouse gases but do not necessarily include all greenhouse gases unless otherwise specified.

determining whether GHG emissions are significant. The paper also evaluates tools and methodologies for estimating impacts, and summarizes mitigation measures. It has been prepared with the understanding that the programs, regulations, policies, and procedures established by the California Air Resources Board (CARB) and other agencies to reduce GHG emissions may ultimately result in a different approach under CEQA than the strategies considered here. The paper is intended to provide a common platform for public agencies to ensure that GHG emissions are appropriately considered and addressed under CEQA while those programs are being developed.

Examples of Other Approaches

Many states, counties, and cities have developed policies and regulations concerning greenhouse gas emissions that seek to require or promote reductions in GHG emissions through standards for vehicle emissions, fuels, electricity production/renewables, building efficiency, and other means. A few have developed guidance and are currently considering formally requiring or recommending the analysis of greenhouse gas emissions for development projects during their associated environmental processes. Key work in this area includes:

- Massachusetts Office of Energy and Environmental Affairs Greenhouse Gas Emissions Policy;
- King County, Washington, Executive Order on the Evaluation of Climate Change Impacts through the State Environmental Policy Act;
- Sacramento AQMD interim policy on addressing climate change in CEQA documents; and
- Mendocino AQMD updated guidelines for use during preparation of air quality impacts in Environmental Impact Reports (EIRs) or mitigated negative declarations.



The following paper evaluates options for lead agencies to ensure that GHG emissions are appropriately addressed as part of analyses under CEQA. It considers the use of significance thresholds, tools and methodologies for analyzing GHG emissions, and measures and strategies to avoid, reduce, or mitigate impacts.

Greenhouse Gas Significance Criteria

This white paper discusses three basic options air districts and lead agencies can pursue when contemplating the issues of CEQA thresholds for greenhouse gas emissions. This paper explores each path and discusses the benefits and disbenefits of each. The three basic paths are:

- No significance threshold for GHG emissions;

- GHG emissions threshold set at zero; or
- GHG threshold set at a non-zero level.

Each has inherent advantages and disadvantages. Air districts and lead agencies may believe the state or national government should take the lead in identifying significance thresholds to address this global impact. Alternatively, the agency may believe it is premature or speculative to determine a clear level at which a threshold should be set. On the other hand, air districts or lead agencies may believe that every GHG emission should be scrutinized and mitigated or offset due to the cumulative nature of this impact. Setting the threshold at zero will place all discretionary projects under the CEQA microscope. Finally, an air district or lead agency may believe that some projects will not benefit from a full environmental impact report (EIR), and may believe a threshold at some level above zero is needed.

This paper explores the basis and implications of setting no threshold, setting a threshold at zero and two primary approaches for those who may choose to consider a non-zero threshold. The first approach is grounded in statute (AB 32) and executive order (EO S-3-05) and explores four possible options under this scenario. The options under this approach are variations of ways to achieve the 2020 goals of AB 32 from new development, which is estimated to be about a 30 percent reduction from business as usual.

The second approach explores a tiered threshold option. Within this option, seven variations are discussed. The concepts explored here offer both quantitative and qualitative approaches to setting a threshold as well as different metrics by which tier cut-points can be set. Variations range from setting the first tier cut-point at zero to second-tier cut-points set at defined emission levels or based on the size of a project. It should be noted that some applications of the tiered threshold approach may require inclusion in a General Plan or adoption of enabling regulations or ordinances to render them fully effective and enforceable.

Greenhouse Gas Analytical Methodologies

The white paper evaluates various analytical methods and modeling tools that can be applied to estimate the greenhouse gas emissions from different project types subject to CEQA. In addition, the suitability of the methods and tools to characterize accurately a project's emissions is discussed and the paper provides recommendations for the most appropriate methodologies and tools currently available.

The suggested methodologies are applied to residential, commercial, specific plan and general plan scenarios where GHG emissions are estimated for each example. This chapter also discusses estimating emissions from solid waste facilities, a wastewater treatment plant, construction, and air district rules and plans.

Another methodology, a service population metric, that would measure a project's overall GHG efficiency to determine if a project is more efficient than the existing statewide average for per capita GHG emissions is explored. This methodology may be more directly correlated to a project's ability to help achieve objectives outlined in AB 32, although it relies on establishment of an efficiency-based significance threshold. The subcommittee believes this methodology may eventually be appropriate to evaluate the long-term GHG emissions from a project in the context of meeting AB 32 goals. However, this methodology will need further work and is not considered viable for the interim guidance presented in this white paper.

Greenhouse Gas Mitigation Measures

Common practice in environmental protection is first to avoid, then to minimize, and finally to compensate for impacts. When an impact cannot be mitigated on-site, off-site mitigation can be effectively implemented in several resource areas, either in the form of offsetting the same impact or preserving the resource elsewhere in the region.

This white paper describes and evaluates currently available mitigation measures based on their economic, technological and logistical feasibility, and emission reduction effectiveness. The potential for secondary impacts to air quality are also identified for each measure. A summary of current rules and regulations affecting greenhouse gas emissions and climate change is also provided.



Reductions from transportation related measures (e.g., bicycle, pedestrian, transit, and parking) are explored as a single comprehensive approach to land use. Design measures that focus on enhancing alternative transportation are discussed. Mitigation measures are identified for transportation, land use/building design, mixed-use development, energy efficiency, education/social awareness and construction.

Table 4: Non-Zero Threshold Evaluation Matrix – Approach 1

Approach 1	1.1	1.2	1.3	1.4
	28% - 33% Reduction from BAU by 2020 by Project	50% Reduction from BAU by 2020 by Project	28% - 33% Reduction by 2020 by Sector	28% - 33% Reduction by 2020 by Region
<i>GHG Emissions Reduction Effectiveness</i>	Low - Captures all new projects but relies on a high level of reductions from the existing economy.	Medium - Captures all new projects and has a more realistic level of reductions from the existing economy.	Low - Captures all new projects but relies on a high level of reductions from the existing economy.	Low - Captures all new projects but relies on a high level of reductions from the existing economy.
<i>Economic Feasibility</i>	Low - Some projects will not be able to afford this level of reduction without effective market-based mechanisms like offsets.	Low - Some projects will not be able to afford this level of reduction without effective market-based mechanisms like offsets.	Medium - Sectors as a whole will be better able to achieve reductions than individual projects.	Low - Some regions and newly developed areas may not be able to afford this level of reduction without effective market-based mechanisms like offsets.
<i>Technical Feasibility</i>	Medium - Some projects will not be able to achieve this level of reduction without effective market-based mechanisms like offsets	Low - Relatively larger set of projects will not be able to achieve this level of reduction without effective market-based mechanisms like offsets	High - Some projects will not be able to achieve this level of reduction without effective market-based mechanisms like offsets	Medium - Some regions and newly developed areas may not be able to afford this level of reduction without effective market-based mechanisms like offsets.
<i>Logistical Feasibility</i>	Low - Absent broader reductions strategies, each project may reinvent the wheel each time to achieve mandated reductions.	Low - Absent broader reductions strategies, each project may reinvent the wheel each time to achieve mandated reductions.	Low - Absent broader reductions strategies, each project may reinvent the wheel each time to achieve mandated reductions.	Low - Absent broader reductions strategies, each project may reinvent the wheel each time to achieve mandated reductions.
<i>Consistency with AB-32 and S-03-05</i>	Medium - Would require heavy reliance on command and control gains.	High	Medium-High - Would rely on command and control gains, but would allow sectoral flexibility.	Medium-High - Would rely on command and control gains, but would allow regional flexibility.
<i>Cost Effectiveness</i>	Low - Will require all types of projects to reduce the same regardless of the cost/ton of GHG reductions.	Low - Will require all types of projects to reduce the same regardless of the cost/ton of GHG reductions.	Low/Medium - Allows tradeoffs within sector between high and low cost reduction possibilities but not between sectors.	Low/Medium - Allows tradeoffs within region between high and low cost reduction possibilities, but not between regions.
<i>Uncertainties</i>	High - BAU changes over time. Ability to reduce GHG emissions from existing economy will take years to demonstrate. Ability to limit GHG emissions from other new development will take years to demonstrate.	Medium/High - BAU changes over time. Ability to limit GHG emissions from other new development will take years to demonstrate.	High - BAU changes over time. Ability to reduce GHG emissions from existing economy will take years to demonstrate. Ability to limit GHG emissions from other new development will take years to demonstrate.	High - BAU changes over time. Ability to reduce GHG emissions from existing economy will take years to demonstrate. Ability to limit GHG emissions from other new development will take years to demonstrate.
<i>Other Advantages</i>	Simple/easy to explain.	Simple/easy to explain.	Spreads mitigation broadly	Spreads mitigation broadly
<i>Other Disadvantages</i>	Requires all projects to quantify emissions.	Requires all projects to quantify emissions.	Requires all projects to quantify emissions.	Requires all projects to quantify emissions.

Table 5: Non-Zero Threshold Evaluation Matrix – Approach 2

Approach 2	2.1	2.2	2.3	2.4	2.5	2.6
	Zero Threshold	Quantitative (900 tons)	Quantitative CARB Reporting Threshold/Cap and Trade (25,000 tons/ 10,000 tons)	Quantitative Regulated Inventory Capture (~40,000 - 50,000 tons)	Qualitative Unit-Based Thresholds	Statewide, Regional or Areawide (CEQA Guidelines 15206(b)).
<i>GHG Emissions Reduction Effectiveness</i>	High - Captures all sources.	High - Market capture at >90%. Captures diverse sources.	Medium - Moderate market capture.	Low - Low market capture.	High - Market capture at ~90%. Captures diverse sources; excl. smallest proj.	Medium - Moderate market capture. Excludes small and med. projects.
<i>Economic Feasibility</i>	Low - Early phases will be substantial change in BAU, esp. for smaller projects; may be infeasible to mitigate.	Medium - Early phases will be substantial change in BAU, esp. for smaller projects; may be infeasible to mitigate.	High - Large projects have greater ability to absorb cost.	High - Large projects have greater ability to absorb cost.	Medium - Early phases will be substantial change in BAU, esp. for smaller projects; may be infeasible to mitigate.	High - Large projects have greater ability to absorb cost.
<i>Technical Feasibility</i>	Low - Early phases will be substantial change in BAU, esp. for smaller projects; may be infeasible to mitigate.	Medium - Early phases will be substantial change in BAU, esp. for smaller projects; may be inefficient to mitigate.	High - Greater opportunities for multiple reduction approaches.	High - Greater opportunities for multiple reduction approaches.	Medium - Early phases will be substantial change in BAU, particularly for smaller projects may be inefficient to mitigate.	High - Greater opportunities for multiple reduction approaches.
<i>Logistical Feasibility</i>	Low - Unless fee or offset basis, very difficult to mitigate all projects.	Medium - BMPs broadly written to allow diversity; new req. will take time to integrate into new dev.	High - Less mitigation.	High - Less mitigation.	Medium - BMPs broadly written to allow diversity; new req. will take time to integrate into new dev.	High - Less mitigation.
<i>Consistency with AB-32 and S-03-05</i>	High - Market capture.	High - Market capture at >90%.	Low - Would rely on command and control success heavily.	Low - Would rely on command and control success heavily.	Medium - Need to demonstrate adequate market capture over time.	Low - Would rely on command and control success heavily.
<i>Cost Effectiveness</i>	Low - Will result in inefficient mitigation approaches. Efficiency will improve in time.	Medium - Emphasis is on new dev., req. for mitigation will result in inefficient mitigation approaches in early phases. Efficiency will improve in time.	Medium - Relies on command and control reductions for existing economy more heavily. With focus on larger projects, eff. of mitigation for new dev. high.	Medium - Relies on command and control reductions for existing economy more heavily. With focus on larger projects, eff. of mitigation for new dev. high.	Medium - Emphasis is on new dev.; req. for mitigation will result in inefficient mitigation approaches in early phases. Efficiency will improve in time.	Medium - Relies on command and control reductions for existing economy more heavily. With focus on larger projects, eff. of mitigation for new dev. high.
<i>Uncertainties</i>	High - Time to adapt for res. and comm. sectors. Ability to mitigate without market-based mechanism for smaller projects unlikely.	Medium/High - Time to adapt for res. and comm. sectors. Ability to mitigate without market-based mechanism for smaller projects uncertain.	High - Gains from command and control likely longer to be realized.	High - Gains from command and control likely longer to be realized.	Medium/High - Time to adapt for res. and comm. sectors. Ability to mitigate without market-based mechanism for smaller projects uncertain.	High - Gains from command and control likely longer to be realized.
<i>Other Advantages</i>	Single threshold.	Single threshold. BMPs can be updated. Greenlist can be updated.	Single threshold. Does not change CEQA processing for most projects. CARB inventory = project inv.. All projects treated same.	Single threshold. Does not change CEQA processing for most projects. Follows established SIP practice.	BMPs can be updated. Greenlist can be updated. Unit-Based thresholds can be updated.	Existing guideline. Does not change CEQA processing for most projects. Endorsed by Cal. Chapter of the APA.
<i>Other Disadvantages</i>	Requires all projects to quantify emissions.	Requires nearly all projects to quantify emissions.			Sectoral projects have different GHG emis. Only largest projects to quantify emis.	Sectoral projects have different GHG emissions.