

**Interim Phase I Report
of the Climate Change Work Group
of the Permits, New Source Review and Toxics
Subcommittee,
Clean Air Act Advisory Committee
February 3, 2010**

I. Introduction

The Climate Change Work Group is pleased to provide this Interim Phase I Report (Report) to the Permits, New Source Review and Toxics Subcommittee and the full Clean Air Act Advisory Committee (CAAAC). The Work Group's deliberations have forged a common understanding, if not always consensus agreement, among members from or representing a variety of industries, state and local governments, and public health and environmental organizations about the issues involved in implementing the Clean Air Act's Prevention of Significant Deterioration (PSD) program permitting requirements for new and modified sources of greenhouse gases (GHGs). The Work Group proposes to expand its deliberations in a second phase, as outlined below. This Report describes the deliberations undertaken to date.

The Clean Air Act (Act) requires that a PSD permit must contain, among other things, air emissions limits or other appropriate control mechanisms for each pollutant subject to regulation under the Act emitted from the source that triggers PSD. 42 U.S.C. § 7475(a). The source must be "subject to the best available control technology" (BACT), *id.* § 7475(a)(4), defined as:

(3) The term "best available control technology" means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this Act emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant. In no event shall application of "best available control technology" result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to section 111 or 112 of this Act. Emissions from any source utilizing clean fuels, or any other means, to comply with this paragraph shall not be allowed to increase above levels that would have been required under this paragraph as it existed prior to enactment of the Clean Air Act Amendments of 1990. Clean Air Act § 169(3).

Since the Supreme Court's decision in *Massachusetts v. EPA*, 549 U.S. 497, 528-29 (2007), finding that GHGs are "air pollutants" within the Clean Air Act definition of that term, intense interest has been focused on the questions whether, when, and how the BACT and PSD permitting requirements should apply to GHG emissions from new and modified major stationary sources. Interested parties across the economy have differing views on these questions, and this Phase I Report does not take a position on them, but does reflect the deliberations of representatives of a diverse group of interests on how EPA and other permitting authorities might implement this provision of the Act to regulate sources of GHGs.

Specifically, at its October 6, 2009, meeting, the CAAAC established a Climate Change Work Group, made up of thirty-five (35) representatives from a variety of industries, state and local governments, and environmental and public health non-profit organizations, organized under CAAAC's Permits, New Source Review and Toxics Subcommittee. Noting that "addressing the challenge of Climate Change will require a well-coordinated effort," and that "[a]ctions by EPA to provide information and policy guidance to assist States, localities, and Tribes and regulated entities implementing measures to reduce GHGs under the Clean Air Act (CAA) would facilitate more efficient and consistent implementation, particularly in key areas such as permitting under the PSD program and the assessment of BACT," EPA charged the Work Group, over a period of six months beginning in October 2009:

... to discuss and identify the major issues and potential barriers to implementing the PSD Program under the CAA for greenhouse gases. The Work Group should focus initially on the BACT requirement, including information and guidance that would be useful for EPA to provide concerning the technical, economic, and environmental performance characteristics of potential BACT options. In addition the Work Group should identify and discuss approaches to enable state and local permitting authorities to apply the BACT criteria in a consistent, practical and efficient manner.

EPA requested two reports from the CAAAC for submission to EPA. EPA envisioned first a relatively brief interim report "... identify[ing] technical, economic, environmental and other information that would be useful to enable sources and permitting authorities to implement BACT for GHGs." A final report of the same length was also commissioned, to include "recommendations for EPA to address the issues and potential barriers associated with the implementation of BACT for GHGs." The multi-interest Work Group, the membership and full charge for which are included as Appendix to this Report, has met frequently both in person and on the telephone, since early October 2009.

II. Scope and Phasing of Work Group Discussions

At its initial meeting on October 6, 2009, Work Group members expressed a range of views regarding the appropriate focus of Work Group discussions during its six-month tenure. These views were divergent and represented significantly different perspectives.

Several members of the Work Group expressed the view that the potential shortness of time before the PSD program may be applied to certain GHG sources required that the Work Group focus its immediate attention on the procedure for applying BACT to such sources assuming that BACT were applied in the same manner as for criteria pollutant sources. These members believe the statute, BACT case law and existing EPA guidance are sufficiently broad to address GHGs.

Some members of the Work Group supported this view because they believe that if the BACT process is changed for GHGs it could change the BACT process for traditional pollutants leading to greater costs, delays and uncertainties. However, they also view the Clean Air Act as the wrong tool to address a global pollutant so that it would be inappropriate to expand BACT beyond its current framework just for GHGs. Their hope is that BACT for GHGs is short-lived and replaced with a comprehensive national program.

Other representatives expressed the view that the Act does not require that PSD or BACT be applied in the same manner as to criteria pollutants, and that the traditional PSD program is not well-suited to the purposes of either reducing GHG emissions or encouraging low-carbon technology or energy-efficiency investments. These members argued that, accordingly, the Work Group should make no such assumptions regarding how the Act should apply to GHG sources. These representatives proposed instead that the Work Group examine the Act's provisions to evaluate whether and to what extent the Agency may or should craft a different approach better suited to GHG sources and to climate stabilization objectives. Under the more expansive discussion urged by these representatives, the Work Group would consider whether and to what extent the statute differentiates between criteria and non-criteria pollutants under the PSD program and whether any such differences permit other approaches for regulating GHG sources under the PSD program. The more expansive discussion would address various approaches not currently used as part of the BACT process, including presumptive BACT, emissions averaging and trading and other streamlining, incentive and compliance flexibility measures, among other topics.

The Work Group resolved this initial disagreement by dividing the Work Group process into two phases. Under the first phase, the Work Group agreed to provide recommendations to help EPA craft BACT guidance for GHGs initially assuming permitting authorities were to apply BACT as they do currently for criteria pollutant sources. This phase was to be completed by no later than December 31, 2009.

The Work Group agreed further to take up a second phase of work commencing January 1, 2010. During this phase, the Work Group agreed to consider Work Group member proposals regarding possible alternative or supplementary approaches to applying the PSD program to GHG sources. While the Work Group did not restrict the scope of issues that could be discussed during this phase, Work Group members identified certain topics that were deferred for consideration until this second phase, including:

- (1) the scope of applicability of PSD and BACT to GHG sources,
- (2) the appropriateness of using presumptive BACT standards for some or all GHG source categories,
- (3) whether it is permissible and appropriate to use averaging or trading (e.g., trading of qualified offsets) either as a BACT mechanism itself or as a compliance flexibility option,
- (4) the potential to credit towards BACT compliance (or for netting) appropriate reductions in carbon intensity, increased energy efficiency or demand reductions at other units within a facility (or among commonly-owned or operated facilities), across a larger range of sources (e.g., a regional electricity grid or transportation system) or at the customer level (e.g., through a smart grid strategy and similar measures),
- (5) how should BACT reviews be conducted and permit conditions established to encourage the development and promote the use of innovative control technologies for GHGs, and
- (6) evaluating energy efficiency processes and practices as part of the top-down BACT determination process, including: benchmarking to help guide the consideration of energy efficiency; potential use of output based standards and policy designed to provide incentives for more efficient solutions, such as combined heat and power, combined cycle turbines and equipment; and, identifying practices and projects that are leaders in deploying efficient and low-emitting solutions.

The Work Group originally scheduled completion of this second phase of discussion by March 31, 2010, the date on which the Work Group's work was intended to end.

III. Phase I Deliberations

On November 5, 2009, the Work Group's second meeting included a series of topical presentations to bring all members to the same level of understanding about the legal basis for PSD permitting generally, and EPA's long-standing suggested "top-down"

approach to establishing BACT emissions limits for criteria pollutants. The Work Group also heard presentations about the status of GHG control technologies, about EPA's efforts to develop a database incorporating information about such technologies, and about various members' experiences to date with on-the-ground permitting of sources that emit CO₂ and other GHGs. The presentations given to the Work Group during this first phase of our work can be found at <http://www.epa.gov/CAAAC/climatechangewg.html>

At this meeting, the Work Group formed four subgroups to address specific issues that fell within Phase I of its deliberations. These issues included:

- 1) **Scope of Analysis: Defining the "Source":** What is the source that is being analyzed for BACT controls?
- 2) **Criteria for Determining Feasible Control Technologies:** Which technologies are demonstrated in practice and what criteria should be used to determine the technological feasibility of a control measure?
- 3) **Criteria for Eliminating Technologies:** How do technologies get eliminated from consideration in the BACT analysis based on cost, energy, environmental or other impacts?
- 4) **Needs of States and Stakeholders:** What are the States' technical information and data needs regarding GHGs control and mitigation measures in the context of determining BACT? What steps can be taken to expedite, streamline or provide additional certainty in the BACT process, especially for existing sources given that most PSD permitting involves existing sources rather than new greenfield sources?

This interim report summarizes the discussions of these four Phase I subgroups only and identifies areas of consensus and disagreement within the context of the Phase I assumption. As noted above, not all Work Group members agreed that the Phase I assumption is appropriate for applying PSD to GHG sources.

IV. Scope of Analysis: Defining the "Source"

Defining "what is the source" for GHG BACT required the Work Group to answer the following questions:

- 1) **What is the "source" or affected emissions unit to which the BACT analysis applies?** To what extent should BACT take into consideration changes to, or emission reductions from, production processes or available methods, systems, and techniques that are outside of, or separate from, the "emissions unit" that an applicant proposes to build or modify?

- 2) **At what point do potentially available control options “redefine a source?”**
To what extent is the BACT analysis limited by the applicant’s proposed project design? To what extent is it appropriate to require permit applicants and permit agencies to evaluate different project designs that emit less GHG, including alternative fuels or energy sources, and energy efficiency improvements?

To answer these questions the Work Group analyzed existing law, regulation, EPA guidance, case law and EAB decisions that are more fully discussed in the Issue Group 1 report (refer to: <http://www.epa.gov/CAAAC/climatechangewg.html>). The following paragraphs present the recommendations of the Work Group as well as a discussion of the areas where the Work Group was unable to reach consensus.

1) What is the Source or Affected Emissions Unit to Which BACT Applies?

Areas of Consensus

The Work Group agreed that EPA should continue to require the application of BACT to new emissions units and to existing emissions units that are undergoing a physical change or change in method of operation. For existing facilities triggering PSD review, EPA should apply BACT to those emissions units that are being physically or operationally changed. For new facilities triggering PSD review, EPA should continue to apply BACT to all new emissions units at the site that emit the pollutant subject to PSD review, in accordance with longstanding EPA interpretation.

Areas of Non-Consensus

The Work Group could not reach consensus on whether the BACT analysis may or should consider parts of the production process beyond the units undergoing a physical change or change in the method of operation. There were two schools of thought:

- Some felt that BACT for GHGs should consider efficiency gains achievable in other portions of the production process related to the new or modified emissions unit (whether they are emitting or non-emitting). These members contend that the broad language of the BACT definition requiring consideration of “production processes and available methods, systems, and techniques . . . for control of [each] pollutant” necessarily encompasses control methods that can be used in any part of the process leading to the emissions, whether or not that part of the process itself emits the pollutant. In addition, in the GHG context, these members believe that it would be fruitful to consider efficiencies across multiple production processes. These members believe the use of the terms “source” and “facility” in the Act are broader than the term “emission unit” and could encompass the entire facility where appropriate or the entire project within a source.
- Others believed that applying BACT for GHGs to units that are not undergoing a physical change or a change in the method of operation would

be an expansion from current practice that should not occur. Under this view, defining the source upon which BACT should be determined to include more than the emissions unit that is undergoing a physical change or change in method of operation would be inconsistent with the statutory language applying BACT to the "proposed facility" as well as current PSD regulations. The members taking this position believe that requiring consideration of actions outside the emission unit undergoing a physical change or change in method of operation is likely to be unworkable because the scope of such actions would be subject to wide interpretation. Moreover, they note that for purposes of modifications, the "proposed facility" language in the statute has been interpreted by EPA to mean the units being physically or operationally changed, (*see, e.g.*, § 52.21(b)(11)'s "begin actual construction" definition) such that a rulemaking would be required for any other interpretation to be issued.

2) At What Point Do Potentially Available Control Options "Redefine A Source?"

Area of Consensus

Court and EAB decisions have used terms such as the applicant's "fundamental business purpose" and a project's "basic design" to help determine the scope of a BACT analysis. While the Work Group agreed that these are key terms, there is not consensus about what these terms mean. The differing viewpoints are discussed below in the non-consensus portion. The Work Group agreed that EPA should address the meaning of these terms.

Areas of Non-Consensus

The Work Group did not reach agreement on the meaning of the terms "fundamental business purpose" and "basic design." The following reflects the differing viewpoints:

- Some members of the Work Group contended that the BACT analysis should not redefine the project as proposed by the applicant because to do so would alter the "fundamental business purpose" and "basic design" of the proposed project. In their view, it is unlawful and inappropriate for BACT to include controls that would redefine or change the fundamental type of project proposed by the applicant. Permit issuers normally would not have the training or expertise necessary to evaluate an applicant's business decision to proceed with a particular type of facility or project. Allowing BACT to include alternative methods to manufacture a product could force companies to consider manufacturing methods that are beyond their core areas of expertise. Moreover, requiring needs analyses is unlawful, inappropriate and would have a chilling effect on normal business decisions to expand or implement quality and efficiency improvements to their production processes.

- Other members of the Work Group feel that the statutory BACT definition requires a broad review of alternative production processes and available methods, systems and techniques, including clean fuels, to lower GHG emissions. In their view, these control technologies must be considered unless they are unavailable or would materially change the product or service provided by the proposed source. These Work Group members believe that EPA should not invoke the “redefining the source” justification to preclude consideration of the full range of control measures listed in the statute. Clean fuels and efficiency are critical mechanisms for reducing GHG emissions. Because the statute requires consideration of clean fuels and production process changes in a BACT analysis, these members believe that requiring such consideration does not alter the “fundamental business purpose” or “basic design” of a proposed project. A broad evaluation of production processes, systems and techniques that would improve efficiency and reduce GHG emissions is, in the view of these Work Group members, mandated by text of the statute, and could also result in significant cost savings. They believe that the terms “fundamental business purpose” and “basic design” should be viewed in this light: the “fundamental business purpose” identifies the product or service to be provided while “basic design” reflects design choices essential to provide that product or service.

V. Criteria for Determining Feasible Control Technologies

The Work Group addressed technical feasibility considerations of potential GHG control technologies in the context of performing a BACT analysis. There were three over-arching consensus recommendations developed. In addition, the deliberations focused on three questions and some examples of specific technologies resulting in consensus and non-consensus perspectives.

Over-arching Consensus Recommendations

- EPA should expand the RACT-BACT-LAER Clearinghouse (RBLC) to include information on GHGs regarding construction status, controls installed, performance data, and compliance test results, including data on operating conditions during testing. The Office of Research & Development (ORD) GHG mitigation database currently under development should be similarly expanded and should include information on foreign sources. EPA should convert data where necessary to ensure a consistent format.
- EPA should explore ways to encourage the use of innovative GHG control technologies.
- EPA should provide guidance regarding evaluating energy efficiency in a BACT analysis on a sector by sector basis.

1) What are the general criteria for determining whether or not a potential control technology is technically feasible for consideration as BACT?

Areas of Consensus:

The 1990 Draft NSR Workshop Manual represents longstanding EPA policy and provides useful guidelines for evaluating the technical feasibility of GHG control technologies. In this context the Work Group provides the following highlights:

- The applicant is responsible for providing evidence that a potential control measure is technically infeasible. The permitting agency is responsible for deciding technical feasibility on a case-by-case basis.
- The RBLC is a starting point for a BACT evaluation and should be updated with verifiable control technology performance data.
- Evaluations of feasibility should consider the full picture of a technology option, including its development stage, commercial applications, scope of installations, and performance data.
- The evaluation scope should be manageable (e.g., an applicant should not be required to perform new tests).
- A technology is feasible if it has been demonstrated in practice or is available and applicable. A technology is applicable if it can reasonably be installed and operated on the source type under consideration.
- Consistent with the 1990 Draft NSR Workshop Manual, a control technology should remain under consideration if it has been applied to a similar chemical and physical exhaust gas stream. If not demonstrated on the type of source under review, then questions regarding availability and applicability should be considered.
- Based on current EPA policy, technologies must be available within the time frame of permit issuance in order to be evaluated beyond step 2 of the top-down BACT analysis. The permitting authority may require the applicant to address the availability and applicability of a new or emerging technology based on information that becomes available during the consideration of the permit.

Areas of Non-Consensus:

Consensus could not be reached on the role and value of commercial guarantees in determining whether production processes and control technologies are technically feasible. Some members have the view that a commercial guarantee (or lack thereof), alone, is not sufficient evidence of the technical feasibility or infeasibility of a control technology or production process.

2) What is meant by "demonstrated in practice" and how does this factor into the determination of technical feasibility?

Areas of Consensus:

The 1990 Draft NSR Workshop Manual provides useful guidance on determining when a technology has been demonstrated in practice and the implications of that for the BACT analysis.

- Demonstrated in practice generally means an available technology has been used in a production situation and has been demonstrated to be successful at achieving the claimed performance. In such a case, the control option is technically feasible for consideration in the BACT analysis.
- Demonstrated in practice implies that an available technology has successfully been demonstrated on a commercial scale to be feasible across a range of reasonably expected operating scenarios. Use on a smaller or larger-sized similar process can be, but is not always, considered to be a "demonstration in practice."
- Controls not demonstrated on any similar source type or flue gas to that proposed may or may not be "applicable" or "available" and may or may not be eliminated on feasibility grounds.

Areas of Non-Consensus: None

3) With respect to technology transfer, what factors should be considered in determining if a control technology is potentially feasible for another process?

Areas of Consensus:

The 1990 Draft NSR Workshop Manual represents longstanding EPA policy and provides useful guidelines for issues related to technology transfer among process applications.

- On a case-by-case basis, the primary factors considered are the characteristics of the gas stream to be controlled, the comparability of the production processes (e.g. batch versus continuous operation, frequency of process interruptions, special product quality concerns, etc.), and the potential impacts on other emission points within the source.
- If a control technology has been demonstrated in practice on a range of exhaust gases with similar physical and chemical characteristics and does not unacceptably affect process operations, product quality, or the control of other emissions, it may generally be considered as potentially feasible for application to another process.

- Detailed information is required to effectively evaluate technology transfer opportunities on a case-by-case basis for a specific source, such as performance information and test data for potential control technologies across a range of operating scenarios and conditions.

Areas of Non-Consensus: None

4) Innovative Control Technologies

Areas of Consensus:

- An innovative control technology is a system that has not been adequately demonstrated in practice, but that would have a substantial likelihood of greater continuous emissions reductions.
- The innovative control technology provision contained in the PSD regulations, and discussed in the 1990 Draft NSR Workshop Manual has been rarely used, however, EPA should evaluate whether it has greater application to GHG emissions.
- In addition to the innovative control technology provision, other ways to promote new and innovative control technology should be considered and encouraged by EPA if they are likely to promote the use of potentially lower GHG emitting technologies.

Areas of Non-Consensus: None

5) Carbon Capture and Sequestration (CCS)

Areas of Consensus

- The technical feasibility of a CCS system to serve as the basis for a BACT determination for a particular source is dependent on the feasibility of both capture and sequestration systems.
- In determining the feasibility of sequestration options on a case-by-case basis, the determination is two-fold: (1) general technical feasibility and (2) site-specific feasibility.
- To determine general technical feasibility, control of CO₂ from the operation of similar units, and different units with similar flue gases, should be evaluated for feasibility, considering the relative sizes of the existing facilities and proposed facility.
- With respect to site-specific feasibility, the physical and legal availability of sequestration capacity (pore space) is relevant in determining feasibility of

CCS for a specific site. However, lack of sequestration potential in formations on or near the proposed site is insufficient justification for not considering CCS in the BACT analysis. In such case, determining the feasibility of piping the CO₂ to another site should be part of the BACT evaluation.

Areas of Non-Consensus:

- **Location Issue:** While the Work Group agrees that the availability of pore space for carbon sequestration, as a legal and technical matter, is relevant, there are varying opinions regarding the application of this factor in a BACT evaluation. There is consensus on the need for evaluation of nearby and available CO₂ pipelines. There is not consensus on using the BACT process to consider changing the location of the source where there is no reasonable sequestration opportunity at or near the proposed site. Some have the view that for CO₂ sequestration purposes, EPA could provide guidance that the BACT process could include evaluation of the site selection. Others have the view that this is beyond the scope of a BACT review, particularly for source modifications triggering PSD and that EPA would need to adopt rules, such as NSPS, if it intended to mandate CCS for certain new sources regardless of location.
- **Degree of Use:** While the Work Group agrees that the extent of availability of carbon capture and sequestration systems is relevant to BACT setting, the Work Group did not attempt to agree on how many CCS systems must be in use, or whether there must be commercial orders (and how many), before CCS is considered demonstrated or available.
- **Similarity:** While the Work Group agrees that the flue gas characteristics and amount are relevant, the Work Group did not agree on how similar an existing source with CCS must be to the proposed source for the CCS technology to be transferable. These factors will likely evolve over time as CCS is applied to more sources and as case by case CO₂ BACT evaluations and determinations are done.

6) Energy Efficiency

Areas of Consensus (limited to those units subject to BACT):

- For an emission unit subject to BACT, improving its energy and process efficiency could be very effective in securing GHG and other emission reductions, and should be included in a BACT analysis.
- Energy efficiency at the unit subject to BACT can be considered in two ways: (1) as a factor in evaluating BACT alternatives; and, (2) in setting emission limits.

- The most efficient options to meet the desired production output should be evaluated.
- Specific energy efficiency limits may be difficult to quantify into an invariable emissions limit. Certain requirements need to be considered. For example: the full range of operating scenarios experienced over the life of the unit; site variability; the deterioration of efficiency as systems age; maintenance cycles; and, whether a threshold requirement for energy efficiency is available for the source category.
- Energy efficiency requirements might be specified as an equipment specification (e.g., a condensing furnace) or as a monitoring/operational procedure to provide continuing indications and maintenance of efficiency (e.g., a carbon monoxide monitor and regular cleaning/tuning of a boiler).

Areas of Non-Consensus:

A consensus could not be reached on how narrow or broad the scope of energy efficiency considerations should be. Points of view by Work Group members paralleled those reflected in the non-consensus perspectives identified in the “Scope of Analysis: Defining the “Source”” section earlier in this report.

7) “Clean Fuels”

Areas of Consensus:

The Work Group recognizes that clean fuels is included in the Act as well as other factors and that EPA should provide guidance on how clean fuels should be considered in the BACT determination process for GHGs.

Areas of Non-Consensus:

There are different views on how clean fuels should be considered in the BACT determination process. One view is that fuel alternatives should be considered broadly in the BACT process. The other view is that the consideration of fuel alternatives is limited by considerations of redefining the source.

VI. Criteria for Eliminating Technologies

Once GHG control technologies are identified as being technically feasible, the Work Group focused on the decision criteria for selecting or not-selecting GHG control technologies or measures based on environmental, cost and energy considerations.

Environmental Impacts

Areas of Consensus:

EPA should allow permitting authorities to continue their current practice of reviewing BACT within the context of the entire application. In other words, the assessment of BACT for GHGs can not be done without consideration of environmental impacts on criteria air pollutants. For example, a control strategy for a GHG pollutant can not result in, or significantly contribute to, the exceedance of a national ambient air quality standards (NAAQS) for a criteria pollutant. The permitting authority has the obligation to determine and document the air pollution priorities associated with the permit review with the goal of optimizing emission reduction benefits.

In the case of a GHG control strategy that results in the increase in criteria pollutants, e.g., the parasitic load increase associated with certain GHG strategies, the permit authority can consider the effects of increases in emissions of other regulated pollutants that may result from the use of that GHG control strategy. The permit authority can determine whether or not the application of that GHG control strategy is appropriate given the increases in other pollutants.

EPA should also emphasize that assessments should not be done without careful consideration of environmental impacts (e.g., overall water quality as well as water quantity especially in regionally sensitive areas). In evaluating a control technology alternative environmental justice should be a relevant consideration in the environment effects analysis. Regulation of GHGs under PSD should be done in a balanced manner that gives full consideration to collateral environmental impacts, for example, including:

- Consideration of beneficial or adverse water-related impacts.
- Consideration of threatened or endangered species, hazardous and solid waste impacts, and soils and vegetation.

Areas of Non-Consensus:

The Work Group did not arrive at a consensus regarding the case where a permitting authority would eliminate a control strategy as BACT for a criteria pollutant if it increased GHG emissions significantly.

Energy Impacts

As it relates to energy-related decision criteria much of the discussion focused on whether the boundaries for the assessment were simply around the facility or involved what was potentially within a source owner's control.

Areas of Consensus:

The Work Group agreed energy efficiency measures are important. Well designed energy efficiency measures can secure multi-pollutant reductions and achieve other collateral environmental benefits, strengthen energy security, and save costs. "Where" the energy efficiency considerations take place (i.e., onsite

versus offsite) and "how" (i.e., in the steps of the top-down BACT process or outside of BACT) are important questions.

Areas of Non-Consensus:

Some Work Group members believe that EPA should examine appropriate opportunities to provide incentives for energy efficiency in a manner consistent with the BACT framework and providing regulatory certainty. Furthermore, EPA, in collaboration with permitting authorities and other interested stakeholders, should design policies to encourage energy efficiency.

In addition some Work Group members believe permittees should examine appropriate opportunities to increase energy efficiency. For example, use of over-fired air or regular tune-ups of boilers can reduce fuel use and GHG emissions. Frequently, permittees have incentives to undertake energy efficiency projects to reduce costs, but due to limited capital, poor return on investment, and the opportunity costs of some energy efficiency projects, they are often not worth pursuing. Finally, the BACT process itself (its delays and cost to undertake the necessary analyses) can discourage beneficial projects from being undertaken so streamlining BACT steps for projects that significantly increase energy efficiency (e.g., expanded CHP) can help reduce emissions.

Economic Impacts

As it relates to cost-related decision criteria the Work Group's views are:

Areas of Consensus:

Each GHG should be assessed on a carbon dioxide equivalent (CO₂e) basis in assessing economic impacts and other costs when making BACT determinations. This will assure comparable economic assessments for GHGs with different global warming potentials (GWPs).

The BACT economic impact assessment considers the ability of the source to bear the cost of air pollution controls. Because CO₂ is emitted in substantially greater quantities than the currently regulated pollutants, cost-effectiveness values will accordingly be significantly smaller on a per unit weight basis.

Areas of Non-Consensus:

The Work Group could not reach consensus on the issue of establishing cost-effectiveness thresholds. Certain Work Group members recommended that a cost effectiveness value for GHGs in the range of \$3 to \$15 per ton CO₂e should be established. Other members recommended that a cost effectiveness value for GHGs in the range of \$30 to \$150 per ton of CO₂e is reasonable based on the range of published costs for mature to first-of-a-kind CCS technologies for coal. Other Work Group members did not support these particular limits or establishing fixed values for GHGs, and recommend that EPA provide guidance to permitting

authorities on the range of cost effectiveness values based on the status of various technologies.

VII. Needs of States and Stakeholders

In discussing the needs of permitting authorities, permit applicants, and other stakeholders the Work Group made the following assumptions:

- State and local agencies will use their existing SIP approved processes for reviewing PSD applications and determining BACT for GHGs.
- The Work Group does not envision a new BACT determination process for GHGs.
- The predominant method for determining BACT is EPA's "top down" BACT determination process, but there are some States (Texas is at least one such State) that have an alternate process in their approved SIP.
- Permitting authorities will initially use technology information provided by EPA (and over time from other permitting authorities) in their BACT analyses, but they will also maintain discretion to weigh environmental factors (such as local air quality) to make BACT determinations. For example, if NO_x is important to the permitting authority because the source is located in either an ozone or NO₂ non-attainment area, a permitting authority may choose in the BACT energy, environment, and cost consideration criteria for technology selection a technology for GHGs that does not result in increased NO_x emissions.
- In its proposed Tailoring Rule, EPA has proposed to set the major threshold cutoff at an emissions level higher than the 100/250 TPY major source emissions levels stated in the Act and/or extend the applicability date to allow permitting agencies to prepare to process the new permits. Permitting authorities do not have the resources to deal with BACT determinations for GHGs at the current major source emissions levels of 100/250 TPY and will need assistance to implement the rule initially at the higher threshold levels. These thresholds would also be problematic and raise significant feasibility concerns for a number of other stakeholders, including small sources and agriculture.

With this as background, the Work Group had the following recommendations:

Communication

Timely communication to all stakeholders is needed to provide the most current information possible regarding BACT determinations for GHGs already made.

Areas of Consensus:

- Communication on GHG control measures must be timely and widespread. The Work Group recommended a periodic GHG control measures newsletter coordinated and developed jointly by the Environmental Protection Agency (EPA) Office of Research and Development (ORD) and Office of Air Quality Planning and Standards (OAQPS) and distributed to the permitting authorities (State, local, Tribal and regional offices) and other interested parties (industries, trade groups, environmental organizations, etc).
- Permit decisions with adequate documentation must be proactively sought by EPA and made available to all stakeholders. Each permitting authority should communicate closely with its EPA Regional office regarding permit applications, issued permits, and identified issues. EPA should establish a system to follow up on issued permits because it is important to document actual experiences.
- The EPA RACT/BACT/LAER Clearinghouse and the EPA ORD GHG mitigation database must be readily accessible, timely, complete, and adequately funded and staffed. The National Association of Clean Air Agencies (NACAA) will provide a State and local permitting agency team to work with EPA on the specific data points which should be included regarding BACT determinations for GHGs.
- Identification of source categories that will be subject to BACT determinations for GHGs is essential. We recommend that the ORD database serve as a primary resource for data on source categories. The RACT/BACT/LAER Clearinghouse will remain as the primary database documenting State, local and Tribal permits.
- Especially during the years 2010 and 2011, communication among EPA, State, local and Tribal agencies, the regulated community and other stakeholders is essential. EPA is urged to work with stakeholders regarding operation of the RACT/BACT/LAER clearinghouse and ORD GHG mitigation database. Each should be readily accessible, timely, complete, and adequately staffed.

Areas of Non-Consensus: None

Guidance

Areas of Consensus:

- EPA should provide guidance on the appropriate methods and formulas for the calculation of costs of GHG controls. EPA should document control cost

calculations and share this information with interested parties thru its various databases.

- EPA should provide guidance on the following approaches/technologies for GHG reductions:
 - pollution prevention measures;
 - efficiency improving technologies for both new and existing industry sectors;
 - emissions factors (so that common baselines are used in assessing technologies);
 - fugitive emissions factors and controls;
 - bio-fuel effects on GHG emissions;
 - monitoring requirements, averaging times, and compliance test methods;
 - accepted control techniques for GHGs other than CO₂; and
 - ranking of GHGs with regard to climate change impact, such that the issue of pollutant substitution/tradeoff can be considered.

Areas of Non-Consensus:

- Some Work Group members recommend EPA develop a list of the largest industrial GHG emitters and consistent with Clean Air Act Section 111 promulgate New Source Performance Standards (NSPS) for those categories. Such standards would provide a floor for BACT determinations and also provide some level of control for sources legally avoiding BACT through netting. Additional resources should be provided to permitting authorities to implement the standards for existing sources.
- Other Work Group members expressed the view that the NSPS program is not an appropriate tool for regulating GHGs.

Steps to Expedite, Streamline and Provide Certainty

Areas of Consensus:

- **Use Existing BACT Determination Process:** While noting the Work Group's disagreement over the scope of BACT review, the Work Group was in consensus that State and local air pollution control agencies use their existing EPA approved process for determining BACT, such that they are not creating a new process for GHGs. The process for determination of BACT under PSD for GHGs must be very clearly defined and communicated and must be legally reliable.
- **BACT Guidance:** EPA should provide compilations of model or example permits for key source categories, separate from the clearinghouses/databases discussed above. EPA should make it clear that any example permit is viewed as a starting point for the permitting authority BACT determination process,

not a presumed end point. Permitting authorities must still follow their approved process for determining BACT.

- **Inventory of sources for GHG PSD BACT:** The Work Group recommends that EPA work with stakeholders to identify all types of GHG sources that can be expected to exceed the major source thresholds.

Areas of Non-Consensus:

- **Presumptive BACT:** There was not consensus on the concept of presumptive BACT. The Work Group has proposed to consider this in its second phase of deliberations.

Netting

Areas of Consensus: EPA should provide guidance regarding the procedure for netting out GHG emissions for PSD applicability purposes.

Areas of Non-Consensus: None

Training

Areas of Consensus: EPA should offer training to permitting agencies, the regulated community and other stakeholders on BACT related topics including, but not limited to, preparing the permit applications (perhaps in separate training sessions for permitting authorities versus that for other stakeholders), source operations and demonstrated energy efficiency improvement techniques for various industry sectors.

Areas of Non-Consensus: None

VIII. Other Issues Discussed by the Work Group

The Work Group considered a number of over-arching issues pertaining to BACT for GHGs. Most of these are being recommended as Phase II topics and are referred to in the "Scope and Phasing of Work Group Discussions" and Section IX of this report, however, some received sufficient deliberation to provide Work Group perspectives and are identified below.

Biomass

The Work Group discussed how to treat biomass from a GHG emissions standpoint for applicability to PSD and BACT determination. Much of the discussion was focused on the extent to which the combustion of biomass is carbon neutral.

Areas of Consensus:

The Work Group agrees that given the broader policy implications concerning the extent to which the combustion of biomass is carbon neutral relative to PSD BACT determinations, EPA is in the best position to determine how biomass fuels should be treated in the BACT analysis, or whether the use of biomass fuels (or certain biomass fuels) should be sufficient to legally avoid the applicability of PSD and BACT.

Areas of Non-Consensus: Two approaches among a number of other alternatives to carbon neutrality of biomass were discussed by the Work Group, but consensus could not be reached on any approach.

- The first alternative assumes that the combustion of biomass is always carbon neutral, and thus the CO₂ emissions from biomass combustion should be excluded from major source and project significant threshold determinations for the purposes of PSD and BACT applicability. In addition, this alternative would exclude those same emissions from the netting process.
- The second approach relies on the assessment of the biomass fuel's full life cycle looking at type of fuel, source of biomass, direct and indirect emissions to determine if it is carbon neutral. EPA should identify what major factors determine which biomass types are carbon neutral (such as forest residues) and thus do not increase atmospheric loadings of GHGs. States would apply those factors on a case-by-case basis to determine carbon neutrality. Some Work Group members were concerned that a case-by-case life cycle assessment for each project could be unworkable and resource-intensive.

Setting Permit Conditions Based on Future Availability of Control Measures

Areas of Consensus: None

Areas of Non-Consensus:

- Some members of the Work Group believe that given the long lifetime of many types of stationary sources, the PSD permit for an emissions unit may include a more stringent emissions limitation that takes effect at a point in the unit's lifetime based on a determination that technology to meet that limitation will be available at that time, even if such technology was not considered demonstrated or available and applicable when the permit was issued.

- Other Work Group members contend that such an emission limitation as described above would be inconsistent with the statute and in certain instances state law, would be impossible to evaluate in a BACT analysis and would reduce the certainty of being able to finance projects. In addition, some Work Group members expressed concern with validating the conditions and demonstrating compliance with the permit terms.

APPENDIX

- The Work Group Charge
- List of Work Group Members

In addition, supporting documents for this report may be found at the following web address: <http://www.epa.gov/air/caaac/climatechangewg.html>

Climate Change Work Group Charge
Permits, New Source Reviews, and Toxics Subcommittee
Clean Air Act Advisory Committee

Addressing the challenge of Climate Change will require a well-coordinated effort. Actions by EPA to provide information and policy guidance to assist states and regulated entities implementing measures to reduce greenhouse gases under the Clean Air Act (CAA) would facilitate more efficient and consistent implementation, particularly in key areas such as permitting under the Prevention of Significant Deterioration (PSD) Program and the assessment of Best Available Control Technology (BACT).

Charge

The charge to the Climate Change (CC) Work Group is to discuss and identify the major issues and potential barriers to implementing the PSD Program under the CAA for greenhouse gases. The Work Group should focus on the BACT requirement, including information and guidance that would be useful for EPA to provide concerning the technical, economic, and environmental performance characteristics of potential BACT options. In addition, the Work Group should identify and discuss approaches to enable state and local permitting authorities to apply the BACT criteria in a consistent, practical and efficient manner.

Duration

The Work Group is expected to convene for a six-month period from October 2009 through March 2010.

Anticipated Outcomes from the Work Group Process

- A draft interim (3-month) and draft final (6-month) written report is to be delivered and deliberated upon by the CAAAC for submission to the US EPA.
- The draft interim report should be completed on or before December 31, 2009, be approximately ten pages (or less) and identify technical, economic, environmental and other information that would be useful to enable sources and permitting authorities to implement BACT for GHGs.
- The draft final report is due on or before March 30, 2010, should also be approximately ten pages (or less) and include recommendations for EPA to address the issues and potential barriers associated with the implementation of BACT for GHGs.

Climate Change Work Group Members List

S. William Becker,
Executive Director
National Association of Clean Air Agencies (NACAA)
444 North Capitol Street, NW Suite 307
Washington, D.C. 20001
Phone: (202) 624-7864
E-Mail: bbecker@4cleanair.org

Buddy Garcia,
Chairman
Texas Commission on Environmental Quality (TCEQ)
P.O. Box 13087 mc 100
Austin, TX 78711-3087
Phone: (512) 239-5515
E-Mail: bgarcia@tceq.state.tx.us

Dennis J. McLerran,
Executive Director
Puget Sound Clean Air Agency
1904 3rd Avenue, Suite 105
Seattle, WA 98101
Phone: (206) 689-4004
E-Mail: dennism@pscleanair.org

*Mark MacLeod,
Director, Special Projects
Environmental Defense Fund
1875 Connecticut Ave., NW
Washington, D.C. 20009
Phone: (202) 387-3500 Ex 3377
E-Mail: mmacleod@edf.org

Jeffrey C. Muffat
Manager, Environmental Regulatory Affairs
3M Corporation
EHS Operations P.O. Box 33331 Building 42-2E-27
St. Paul, MN 55133
Phone: (651) 778-4450
E-Mail: jcmuffat@mmm.com

Ms. Lisa P. Gomez,
Director, Environmental Services
Sempra Energy Utilities
8315 Century Park Court, CP21E
San Diego, CA 92123
Phone: (858) 654-3580
E-Mail: LPGomez@Semprautilities.com

John M. McManus,
Environmental Services
American Electric Power Service Corporation
1 Riverside Plaza
Columbus, OH 43215
Phone: (614) 716-1268
E-Mail: jmmcmanus@aep.com

Ms. Carolyn L. Green,
Managing Partner
EverGreen Capital Management
150 N. Radnor Chestor Road, Ste. F-200
Radnor, PA 19087
Office: (610) 977-2423
Cell: (215) 280-8603
E mail: clg@energrecapital.com

Jack McClure,
Manager, Air Quality Programs
Shell Oil Products Company
1 Shell Plaza
Houston, TX 77002
Phone: (713) 241-3999
E-Mail: jack.mcclure@shell.com

Charles H. Knauss,
Bingham McCutchen LLP
2020 K Street 10th Floor NW
Washington, D.C. 20006
Phone: (202) 373-6644
E-Mail: chuck.knauss@bingham.com

Valerie Ughetta,
Director, Stationary Sources
Alliance of Automobile Manufacturers
1401 Eye Street N.W. #900
Washington, D. C. 20005
202-326-5549 (office)
202-326-5568 (fax)
E-Mail: vughetta@autoalliance.org

Stephen Hartsfield
Program Director
National Tribal Air Association (NTAA)
4520 Montgomery Blvd NE, Suite 3
Albuquerque, NM 87109
Phone: (505) 242-2175
E-Mail: SHartsfield@ntec.org

Mr. Phillip J. Wakelyn, PhD
Senior Scientist, Environmental Health and Safety
National Cotton Council
1521 New Hampshire Avenue
Washington, D.C. 20036
Phone: (202) 601-1137
E-Mail: pwakelyn@cotton.org

David Foerter
Director
Institute of Clean Air Companies (ICAC)
1730 M Street NW Suite 206
Washington, DC 20036
Phone: (202) 457-0911
E-Mail: dfoerter@icac.com

Ann Weeks
Clean Air Task Force
18 Tremont Street Suite 530
Cambridge, MA 02108
Phone: (617) 624-0234
E-Mail: aweeks@catf.us

David Doniger,
Natural Resources Defense Council
Phone:
E-Mail: ddoniger@nrdc.org

Joanne Spalding
Senior Staff Attorney
Sierra Club
85 Second Street, Second Floor
San Francisco, CA 94105
Phone: (415) 977-5725
Fax: (415) 977-5793
E-Mail: joanne.spalding@sierraclub.org

Mr. John A. Paul, Administrator
Regional Air Pollution Control Agency
Dayton, Ohio 45422-1280
Phone: (937) 225-5948
E-Mail: paulja@rapca.org

Laurel Kroack,
Illinois EPA
E-Mail: laurel.kroack@Illinois.gov

Praveen Amar,
Director of Science and Policy
NESCAUM
89 South Street, Suite 602
Boston, MA 02111
Phone: (617) 259-2026
E-Mail: pamar@nescaum.org

James Goldstene,
California Air Resources Board
E-Mail: jgoldste@arb.ca.gov

Donald Neal,
Vice President, Environmental Health & Safety
Calpine Corporation
717 Texas, Suite 1000
Houston, TX 77002
Phone: (713) 830-2004
E-Mail: don.neal@calpine.com

*Eric Svenson,
Vice President, Environment, Health and Safety
Public Service Enterprise Group
80 Park Plaza, T-10
Newark, NJ 07102
Phone: (973) 430-5857
E-Mail: eric.svenson@pseg.com

Tim Hunt,
Senior Director
Air Quality Programs
American Forest & Paper Association
1111 19th Street N.W. Suite 800
Washington D.C. 20036
Phone: (202) 463-2588
E-Mail: Tim_Hunt@afandpa.org

John Busterud, PG&E
E-Mail: JWBB@pge.com

Jared Snyder
Assistant Commissioner
NY DEC
E-Mail: jjisnyder@gw.dec.state.ny.us

Judi Geenwald,
Vice President Innovative Solutions
Pew Center on Global Climate Change
1201 Wilson Blvd., Suite 550
Arlington, VA 22201
Phone: (703) 516-4146
E-Mail: greenwaldj@pewclimate.org

Ben G. Henneke, Jr.
Clean Air Act Corporation
7134 South Yale Suite 310
Tulsa, OK 74136
Phone: (918) 747-1523
E-Mail: benh@CleanAirAction.com

Robert A. Wyman,
Partner
Latham and Watkins LLP
633 West Fifth Street, Suite 4000
Los Angeles, CA 90071-2007
Phone: (213) 485-1234
E-Mail: Robert.wyman@lw.com

John Holmes,
AEMS, LLC
2443 North Quantico St
Arlington VA 22207
Phone: (703) 536-2920
E-Mail: HolmesAems@aol.com

Bill O'Sullivan
NJ Dept. of Environmental Protection
Phone: (609) 984-1484
E-Mail: Bill.o'sullivan@dep.state.nj.us

Howard Feldman
American Petroleum Institute
Phone: (202) 682-8340
E-Mail: Feldman@api.org

Bill Wehrum
Hunton & Williams
1900 K Street, NW
Washington, DC
Phone: (202) 955-1637
E-Mail: wwehrums@hunton.com

Larry S. Monroe
Southern Company
E-Mail: lsmonroe@southernco.com

****Indicates Co-Chairs**