

VOLUNTARY GREENHOUSE GAS REPORTING

DRAFT WORKSHOP BACKGROUND PAPERS

WASHINGTON DC
November 18–19

CHICAGO
December 5–6

SAN FRANCISCO
December 9–10

HOUSTON
December 12–13

November 13, 2002

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

DRAFT BACKGROUND PAPERS

1. INTRODUCTION TO BACKGROUND PAPERS
2. ANNOTATED AGENDA AND KEY ISSUES
3. ORGANIZATIONAL BOUNDARIES
4. DIRECT AND INDIRECT EMISSIONS
5. EMISSIONS INTENSITY AND OTHER BASELINE MEASURES
6. ACCOUNTING FOR SMALL DISTRIBUTED SOURCES AND SINKS
7. PROJECT EMISSIONS AND REDUCTIONS
8. INTERNATIONAL EMISSIONS REPORTING
9. EMISSIONS DATABASES AND REGISTRIES - THE INTERNATIONAL CONTEXT
10. CONFIDENTIALITY OF REPORTED DATA
11. VERIFICATION ISSUES

1. INTRODUCTION TO BACKGROUND PAPERS

Voluntary Greenhouse Gas Reporting Workshops

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

INTRODUCTION TO BACKGROUND PAPERS

The Voluntary Greenhouse Gas Reporting Workshops background papers identify issues and options involved in developing revisions to the Department of Energy's Voluntary Greenhouse Gas Reporting Program (VGGRP), which was created pursuant to Section 1605(b) of the Energy Policy Act of 1992. The background papers, which do not represent official government views, are intended to stimulate discussion on a wide range of issues. Ideas discussed in the papers reflect comments received from the public, previously published reports and papers, and interactions with a wide range of government and private sector representatives. Background papers are available at: <http://www.pi.energy.gov/enhancingGHGregistry>.

The reporting program, in operation since 1994, records voluntarily submitted data on greenhouse gas (GHG) emissions and the results of actions to reduce, avoid, or sequester greenhouse gas emissions. On February 14, 2002, the President announced his Climate Change Initiative which includes a GHG intensity target, research programs and tax incentives to advance the development and adoption of new technologies, voluntary programs to promote actions to reduce GHGs, and improvements to the existing VGGRP reporting program. Specifically, the President:

Directed the Secretary of Energy, in consultation with the Secretary of Commerce, the Secretary of Agriculture, and the Administrator of the Environmental Protection Agency, to propose improvements to the current voluntary emissions reduction registration program under section 1605(b) of the 1992 Energy Policy Act within 120 days. These improvements will enhance measurement accuracy, reliability, and verifiability, working with and taking into account emerging domestic and international approaches.

Directed the Secretary of Energy to recommend reforms to ensure that businesses and individuals that register reductions are not penalized under a future climate policy and to give transferable credits to companies that can show real emissions reductions.

Directed the Secretary of Agriculture, in consultation with the Environmental Protection Agency and the Department of Energy, to develop accounting rules and guidelines for crediting sequestration projects, taking into account emerging domestic and international approaches.

On May 6, 2002, the Department of Energy solicited comments on various issues relevant to its efforts to implement the President's directives. The request for comments and the comments received are located at the website above. On July 8, 2002, after considering public comments, the Secretaries of Energy, Commerce and Agriculture, and the Administrator of the Environmental Protection Agency provided the President with ten recommended improvements to the VGGRP:

1. *Develop fair, objective, and practical methods for reporting baselines, reporting boundaries, calculating real results, and awarding transferable credits for actions that lead to real reductions.* Developing such methods is central to achieving the objective of “measurement accuracy, reliability, and verifiability,” as specified in the February 14, 2002, announcement.
2. *Standardize widely accepted, transparent accounting methods.* In 1994, when DOE’s voluntary greenhouse gas reporting program was launched, accounting methods were deliberately flexible to promote broad participation. Since then, a large body of work on corporate and project-level emissions, reductions, and sequestration accounting has been developed. The revised and standardized voluntary reporting program will take these methods into consideration and establish a systematic and transparent approach for updating accounting rules as they evolve.
3. *Support independent verification of registry reports.* As the current voluntary program evolves from a reporting program toward a crediting program, it is important to ensure that reports are accurately and consistently prepared and in compliance with specified accounting rules. Requiring independent verification of reports, particularly those that qualify for transferable credits, will enhance the accuracy, acceptability, and credibility of the program.
4. *Encourage reporters to report greenhouse gas intensity (emissions per unit of output) as well as emissions or emissions reductions.* Reporting emissions intensity allows firms to take growth into consideration and is consistent with the overall goal of achieving an improvement in greenhouse gas intensity by 2012. To verify the intensity measures, reporters will need to submit the data necessary to calculate emissions intensity.
5. *Encourage corporate or entity-wide reporting.* The revised voluntary reporting program should encourage corporate or entity-wide reporting. However, many important prospective emission reductions actions, such as those relating to sequestration, energy efficiency, small-scale renewable energy, or actions that reduce greenhouse gases other than carbon dioxide may be difficult to accommodate within the context of entity-wide emissions reporting. Encouraging entity-wide reporting while allowing for opportunities to report by projects acknowledges the importance of recognizing a broad range of actions and facilitating cost effective ways to reduce direct and indirect emissions.
6. *Provide credits for actions to remove carbon dioxide from the atmosphere as well as for actions to reduce emissions.* Sequestration activities can provide a valuable contribution to meeting our 2012 goal. Providing incentives and recognition for actions to reduce the concentration of greenhouse gases in the atmosphere will facilitate their adoption.

7. *Develop a process for evaluating the extent to which past reductions may qualify for credits.* A process needs to be developed for evaluating these past efforts against the criteria now being developed for consistent and accurate reporting.
8. *Assure the voluntary reporting program is an effective tool for reaching the 18 percent goal.* The enhanced registry and reporting program is one piece of a broad domestic effort to reach our 18 percent goal. It is important to link voluntary programs, such as the Environmental Protection Agency's Climate Leaders and Business Challenges, with reporting guidelines to encourage consistency between private actions and public goals.
9. *Factor in international strategies as well as State-level efforts.* As directed on February 14, 2002, we need to carefully review emerging international approaches, including other national efforts such as those of Australia, Canada, Japan, Denmark, and the United Kingdom (and other Member States of the European Union). In addition, public and private domestic approaches should be should be closely considered.
10. *Minimize transactions costs for reporters and administrative costs for the Government, where possible, without compromising the foregoing recommendations.*

In addition to these recommendations, the Secretaries of Energy, Commerce and Agriculture, and the Administrator of the Environmental Protection Agency proposed a process leading to revising the guidelines by January 2004. The process includes the workshops for which these background papers are prepared. The workshops are intended to foster an open dialog to assist the DOE and the other participating agencies in improving the reporting guidelines as authorized by existing law and directed by the President. By focusing the dialogue on specific issues and questions, many of which are addressed in the background papers, we hope the workshops can provide as much constructive input to this process as possible.

2. ANNOTATED AGENDA AND KEY ISSUES

Voluntary Greenhouse Gas Reporting Workshops

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

ANNOTATED AGENDA AND KEY ISSUES

I. Introduction to Key Questions and Issues

The draft agenda, which was made generally available on Monday, November 4, identifies the specific topic areas expected to be addressed during the workshop. The facilitator is likely to follow the order and groupings of issues as reflected in the draft agenda.

This paper expands on each of the topic areas identified in the agenda, mainly by posing various questions which require resolution and could be addressed by workshop participants.

There are also various cross-cutting issues that are relevant to many of the specific topics listed in the agenda. Two such issues are: rigor versus practicality, and consistency with other reporting programs.

Rigor versus Practicality. There are likely to be conflicts between the desire to ensure reports are accurate, reliable and verifiable, and the desire to establish practical guidelines that can be implemented at modest cost by a broad range of utilities, businesses and institutions. This potential conflict has led some participants in the current program and others to raise cross-cutting questions that are relevant to most of the specific issues likely to be addressed during each workshop:

1. Should the new guidelines set different requirements for different types of entities to reflect differences in their capabilities (e.g., large industries v. independent wind energy generators v. farmers) and characteristics (e.g., electric generators with a single product, electricity, v. large manufacturers, with multiple business lines and dozens of different products)?
2. Should the new, more rigorous guidelines be applied to all program participants, or should participants that are not seeking special recognition or credit be permitted to continue to report under more flexible guidelines?

Consistency with other international- and state-level reporting programs. Specific definitions of boundaries, conversion factors, output measures and other factors often differ from one reporting protocol to another:

1. Should DOE try to standardize such definitions?
2. When should DOE defer to definitions and methods developed by others rather than create or maintain its own?

III. Emissions Reporting

Setting procedures for identifying, measuring, and verifying greenhouse gas (GHG) emissions is the first step to any reporting program. DOE's existing Voluntary Greenhouse Gas Reporting Program (VGGRP) enables reporters to determine the scope of their reports and the specific GHGs covered by these reports, and provides other types of flexibility. To comply with the President's directives to "enhance measurement accuracy, reliability, and verifiability," the current program needs to be revised. While these objectives are clear, a number of questions must still be addressed.

A. Organizational and Geographic Boundaries (See *Background Paper: Organizational Boundaries*; and *Background Paper: International Emissions Reporting*)

- i) If the revised guidelines specify reporting all of an entity's (corporation's) emissions, how should the guidelines define the entity boundaries? Should corporate entities be determined by equity share (or ownership), operational control (financial responsibility) or lines of business activity? Should program participants be given some flexibility to define their own boundaries? If yes, under what circumstances?
- ii) Should the boundaries of institutional and governmental entities be determined by ownership, financial responsibility, governance or other factors? Should institutional reporters be given some flexibility to define their own organizational boundaries? If yes, under what circumstances?
- iii) How can entity-wide reporting be most effectively encouraged? If entity-wide reporting is the basis for reporting, should the guidelines place any constraints on how participants define sub-entity or project boundaries for the purpose of reporting emissions?
- iv) Should participants submit reports on their non-U.S. emissions? (or only their U.S. emissions?) Should U.S. emissions be distinguished from non-U.S. emissions?

B. Operational Boundaries and Related Issues

- i) Direct versus indirect emissions (See *Background Paper: Direct and Indirect Emissions*). The existing program requests participants to calculate the indirect emissions associated with electricity (and purchased steam/hot water?)

- (a) Should participants report the indirect emissions associated with their use of electricity (and purchased steam)?
 - (b) Should they report other types of indirect emissions, such as those associated with the production materials that they purchase; those associated with business travel or employee commuting; emissions associated with the use of the products they produce? Are there practical ways of measuring such emissions?
 - (c) If electricity use is to be reported, how should emissions associated with electricity use be calculated? Because users of electricity generally have no control over or responsibility for the carbon intensity of electricity generation, should DOE specify the use of fixed conversion factors for electricity (or steam)? If so, how should DOE determine these conversion factors? Are there any circumstances when a user of electricity should be permitted to calculate their own conversion factors?
- ii) Gases and sources covered. The existing guidelines cover the six major greenhouse gases covered by the UNFCCC.
- (a) Should participants report their emissions of these six gases? Should this list of gases be expanded (or shortened)?
 - (b) Converting to carbon dioxide equivalent values: Under the existing program, DOE asks participants to report emissions in terms of physical units of fossil fuels consumed or in the physical units of other covered greenhouse gases. DOE then converts these physical units into estimated total greenhouse gas emissions using the carbon dioxide equivalency factors (derived using Global Warming Potential estimates for each greenhouse gas and, in the case of fossil fuels, the estimated release of CO₂ per unit of fuel consumed) established by the most recent assessment of the IPCC. Because carbon dioxide equivalency factors established by the IPCC's Third Assessment Report and used by DOE's Energy Information Administration do not correspond to the older factors still being used by the UNFCCC, there is some possibility for confusion. Which equivalency factors should be used? And when should they be updated?
 - (c) Practical limits to emission measurement and reporting: Very small or fugitive emissions: Some entities emit only very small quantities of certain greenhouse gases. Others may be responsible for "fugitive" emissions that cannot be readily monitored or quantified [such as the methane emissions associated with surface coal mining or the releases (and sequestration) of carbon and other gases associated with all agricultural operations]. Still others may have very small subsidiaries or organizational elements for which the necessary

record keeping could be burdensome. Under what circumstances should entities be permitted to exclude certain emissions from their reports?

C. Measurement and Accounting Methods

- i. Initial reporting year(s) (See *Background Paper: Emissions Intensity and Other Baseline Measures*). Should all emissions reporting under the revised guidelines be start no earlier than a given year, e.g. 2003? Should participants be permitted to report emissions for prior years, if these reports meet the requirements of the new guidelines? Should participants be allowed or required to average emissions over some time period, e.g. 2000 to 2003 rather than select a single initial year? The existing forms allow for reports back to 1987? Should this updated?
- ii. Emissions measurement / estimation methods. Should the new guidelines specify the methods to be used in measuring and recording emissions? Should quantities of the specific fossil fuels combusted be considered sufficient basis to estimate greenhouse gas emissions? Under what circumstances should participants be required to monitor and report their actual emissions? If emissions are derived from an estimation technique, how might the guidelines help ensure that those estimation techniques are valid?
- iii. Confidentiality issues (See *Background Paper: Confidentiality of Reported Data*). Some entities may be concerned that annual reports of their greenhouse gas emissions may reveal information that is valuable to their competitors. Should DOE collect and try to protect such data? Or should such companies be exempted from any emission reporting guidelines? Are there other possible solutions to such problems?
- iv. Consideration of state-level and international reporting programs (See *Background Paper: Emissions Databases and Registries – The International Context*). A number of different protocols for measuring and reporting greenhouse gas emissions have been developed (and most of these protocols are continuing to evolve). Should DOE give special consideration to the provisions of such protocols? If so, how?
- v. Comparability across sectors. Should the DOE guidelines for measuring and reporting emissions be the same for all sectors? Under what circumstances should the DOE guidelines take into account the unique characteristics and capabilities of different types of entities?

IV. Emissions Reductions

Determining when a creditable reduction in GHG emissions has been achieved and how to quantify and certify such emission reductions is perhaps the most difficult and controversial issue requiring resolution. There are many factors that affect the annual emissions of specific corporations, institutions or other entities. Emission reductions (or increases) by one entity may or may not indicate that an entity has contributed to a net reduction in U.S. and global greenhouse gas emissions or greenhouse gas emissions intensity. There are two types of questions that need to be addressed to enable the crediting of emission reductions: (1) questions regarding what types of emission reductions should be recognized as "creditable"; and (2) questions regarding the practicality and reliability of various methods used to quantify such reductions.

A. Characteristics of Creditable Reductions. To identify the types of emissions reductions that should be recognized, a useful first step is to define the desirable characteristics of "creditable" reductions. One way of distinguishing different types of emission reductions is to identify their cause.

- i) Output effects. Increases in production or decreases in production are often reflected in comparable increases or decreases in greenhouse gas emissions, especially those emissions associated with fuel use. Should all or some emission reductions be calculated so as to exclude the effects of such output changes? For example, should a company that is growing rapidly, but which has successfully kept its greenhouse gas emissions level, be credited for emission reductions? Or should a company that has reduced substantially its production or divested some of its operations be permitted to claim emission reductions that resulted from such production declines?
- ii) Other Causation Issues. There are many other "causes" of decreased or increased emissions. Can or should these different "causes" be used to help identify creditable emission reductions. For example, does it matter whether an emission reduction resulted from:
 - a) a warm winter or an unusually wet year?
 - b) actions taken by some other entity, e.g. actions by a utility to reduce the emissions associated with the electricity that is being reported by an industrial customer? actions taken by the producer of equipment or vehicles v. their purchase and use by consumers?
 - c) improvements to the operation and maintenance of an existing facility? or an investment in existing or new technology?
 - d) an investment that was economically attractive or one that was not?

- e) an investment that was mandated by government regulation, encouraged by a government incentive or encouraged by a government program?
 - f) Does it matter whether an emission reduction resulted from actions that were also taken by most other companies (or institutions) within the same industry, e.g. should a creditable emission reduction be demonstrably greater than the emission reductions achieved by other companies within the same industry?
- iii) Durability. Should it matter whether an emission reduction is temporary or sustained for more than one year (or many years)?
 - iv) Corporate-wide or sub-corporate emission reductions. Most large corporations are likely to have some plants or facilities that are decreasing emissions and others that are increasing emissions. Should corporations or other participating entities be permitted to claim only net, entity-wide emission reductions or should they be permitted to claim reductions that were achieved in only one part of the corporation or institution?
 - v) Comparability within and across sectors. Should the definitions and methods of calculating emission reductions be sufficiently similar to permit comparisons from one corporation to another within the same industry? Or from one industry to another?
 - vi) Offsets. Should it matter whether an emission reduction achieved by a particular entity occurs outside the boundaries of that entity? What if such an offsetting emission reduction occurs within the boundaries of another reporting entity?
 - vii) U.S. v. non-U.S. reductions. Should it matter whether an emission reduction is achieved outside the U.S.?

B. Calculation Methods. It is unlikely that program guidelines can be designed so as to identify only those emission reductions that were fully consistent with a particular set of ideal characteristics. Inevitably, the methods developed to identify and calculate emission reductions will only be able to approximate the desired objectives.

- i) Emissions intensity measures. Measures of emission intensity are intended to control automatically for changes in output. Should the guidelines specify all reporting entities use a measure of greenhouse gas emissions intensity to adjust for changes in output? What other ways might be used to take into account the effects of output changes? Many entities will not be able to identify a single measure of output for all of

their operations. Should they be encouraged, required or permitted to use emissions intensity measures for sub-corporate (sub-entity) estimates of emission reductions? Should DOE specify or approve the measures of output used by different entities? Should each company/institution be permitted to develop its own measure of output? Should all companies within the same industry be required to use the same measures of output?

- ii) Net emission reductions. What methods might be used to ensure that only net, entity-wide emission reductions are recognized? How could entities be encouraged or required to report emission reductions at the highest level of aggregation possible?
- iii) Double counting. Users and producers of electricity might both report and claim credit for the same emissions and emissions reductions. How can double counting of these emissions and emission reductions be minimized? If emission reduction credits can be earned both by owners/users as well as manufacturers/producers of products or fuels that reduce greenhouse gas emissions, how can double-counting be prevented or minimized. Who should be able to claim credit for such reductions?
- iv) Fixed or dynamic emissions intensity baselines. Any decline in emissions intensity over time could be credited as an emissions reduction (in this case, an entity's emissions intensity in any given year could serve as a fixed baseline from which to calculate the emission reductions achieved in future years). Alternatively, dynamic baselines (ones that change over time) could be used in order to exclude emission reductions that were likely to result from normal increases in productivity, rather than special actions. If such dynamic baselines desired, how might they be calculated?
- v) Projects. (See *Background Paper: Project Emissions and Reductions*) Projects are usually specific actions or investments that result in emission reductions, such as the construction of a wind machine that generates electric power, installation of a cogeneration facility, investments in energy efficiency or the planting of trees to sequester carbon. Projects can be within or outside of corporate or institutional boundaries. Some projects have measurable effects, such as the generation of electricity, while others have effects that can only be estimated. When should entities be permitted to claim emission reductions associated with specific projects? For those projects where direct or indirect measurement of emission reductions is impossible, how might such effects be estimated? Should any project that results in emission reductions be recognized, or should DOE set thresholds that have to be exceeded before the emission reductions from a project are

credited? Should small scale projects be allowed to use simplified methods for calculating emissions reductions or carbon sequestration? If so, what would be considered a small project.

- vi) Absolute emissions and other possible alternatives to emission intensity measures or projects. If no useable measure of output exists and the use of project-based estimates would be inappropriate, how might emission reductions be estimated? Should changes in total emissions be used if no measure of emission intensity is available.
- vii) Base years and baselines. Should emission reductions be credited only if they occur after the new guidelines have been issued? Should emission reductions that occurred in prior years, but which have been demonstrated to comply with the new guidelines, be recognized as well? Should the emissions or emission intensity of the base year serve as a fixed baseline from which all future emission reductions are calculated, or should this baseline be modified annually or periodically. If it should be modified, on what basis should such modifications be made?
- viii) Multiyear reporting / averaging. Should multiyear reporting and/or averaging be used to minimize recognition of temporary emission reductions, such as those that result from annual weather changes, or temporary shifts in capacity utilization? Should entities claiming reductions be required to continue to report even after being given credit for certain reductions? What if emissions or emissions intensity increase in future years?
- ix) Confidentiality issues. What data associated with the calculation of emission reductions should be made public? Under what circumstances should entities be allowed to withhold data relevant to calculation of their emission reductions or to request that such data remain protected from public release?
- x) Consideration of state-level and international methods for crediting emission reductions. A number of different methods have been developed for identifying and recognizing emission reductions (and most of these methods continue to evolve). Should DOE base its guidelines on one (or more) of these non-government protocols? Should DOE give special consideration to specific requirements contained in such protocols or should DOE base its guidelines on its own determination of what is the best, most accurate approach?
- xi) Relationship to other voluntary programs. There are many different government programs designed to encourage voluntary reductions in greenhouse gas emissions by giving special recognition to efforts that reduce emissions (e.g., The President's Energy Partners for Climate

Action, Climate Leaders and the existing Voluntary Greenhouse Gas Reporting Program, which is the focus of these workshops). Should the actions recognized under these programs also be credited as emission reductions under the new, more rigorous guidelines that are the focus of these workshops? Or should these programs use the new, more rigorous guidelines to quantify the emission reductions that they recognize?

V. Breakout Session Key Questions and Issues

A. Electricity generation

- i. Can reductions in emissions-per-kwh-generated be used to calculate the total emissions reductions that should be credited to specific utilities/generators?
- ii. How should acquisitions/divestitures of existing plants be treated? How should plant retirements or the production from new plants be treated?
- iii. Should any distinctions be made among different types of reductions, e.g. investments in new renewable generation v. increased production from existing nuclear plants?
- iv. What methods might be used to minimize the credit given to transitory changes in emissions that result from cyclical changes in weather, rainfall or loads, while still enabling participating entities to begin receiving credit for their reductions within the next few years?
- v. If customers pay higher rates for renewable generation, should they be able to obtain credit for the resulting emission reductions? If utilities provide incentives to encourage their customers to reduce electricity demand, should they be able to claim credit for emission reduction? How can double counting be minimized?

B. Industrial and other large sources

- i. Which industries have broadly accepted physical measures of output, e.g. tons of cement or tons of steel? Can these measures of output be usefully applied to all emissions for individual corporations?
- ii. Should DOE specify certain output measures? Should industry trade associations or individual companies be permitted to develop and propose their own measures of output?
- iii. If there is no generally accepted physical measure of output that can be applied to whole industries or whole corporations, what other approaches might be used to take into account changes in output? Could economic measures of output, such as value added, serve as a meaningful indicator or year-to-year changes in output?
- iv. Should companies that are unable to develop an entity-wide measure of emission intensity be encouraged or required to use sub-entity measures of emissions intensity, e.g. for a specific business line or plant?
- v. Should changes in "output" be taken into account when estimating real reductions in the emissions of all non-carbon gases?

- vi. Since emissions intensity is based on production data, and such production data is often treated as a trade secret, some companies are very concerned about the type of the data that might have to be reported. How might a company provide an independently verified estimate of its emissions and emission reductions, without disclosing its production data at the same time?

C. Independent renewable energy production

- i. Renewable energy that is produced by entities that report their total emissions and emission reductions is likely to be automatically accounted for in entity-wide reports. Under what circumstances should a producer of renewable energy be permitted to claim credit for the emission reductions resulting from specific renewable energy projects?
- ii. Should such renewable energy producers be required to take into account and report any greenhouse gas emissions for which they are responsible?
- iii. If electricity is being produced by a renewable energy project, how should the emissions displaced by such electricity production be calculated?
- iv. If ethanol is being produced by a renewable energy project, how should the emissions displaced by such ethanol production be calculated?

D. Agricultural and forestry sequestration

- i. How can there be some assurance that the benefits claimed by an entity responsible for a specific sequestration project are not being offset by other actions by the same entity?
- ii. The benefits of some sequestration projects can be reversed by some future action. How can there be some assurance that credited emission reductions achieved through sequestration will be accounted for if a reversal takes place? Who should be responsible and what is the best way to assign responsibility if carbon that is sequestered is later emitted?

E. Small distributed sources (residential and commercial buildings; transportation) *(See Background Paper: Accounting for Small Distributed Sources and Sinks)*. Because it is unlikely that individual households or small and medium sized businesses will choose to report directly their emissions or emission reductions, how might the Voluntary Greenhouse Gas Reporting Program be designed to credit efforts to reduce emissions in these sectors?

- i. Should DOE recognize the emission reductions that result from the manufacturing of more energy efficient products or vehicles, or the construction of more efficient buildings? Are there other types of actions that result in reduced emissions by small emitters that might also be recognized?

- ii. If emission reduction credits are given to certain product manufacturers or builders, how can there be some assurance that the resulting emission reductions are not also being claimed by the users of these products or buildings?
- iii. How might the emission reductions associated with energy efficient products, vehicles or buildings be calculated?
- iv. Many products, vehicles and buildings are subject to minimum efficiency standards set by Federal, state or local governments. Should manufacturers or builders be given credit for emission reductions that result such standards?

VI. Verifying Emissions and Reductions (See *Background Paper: Verification Issues* and *Background Paper: Confidentiality of Reported Data*).

A. Types and frequency of verification.

- i) Should independent verification be required for each (annual) report, less frequently or only if challenged?
- ii) Should program participants independently verify: process and methods; the actual data upon which emission reports and emission reduction estimates are based; and/or the physical means by which emissions are measured (e.g. meters for fuel consumption or monitors that measure actual emissions)?
- iii) Even after they have been independently verified, should all participants be required to maintain records of the data, measurement and testing methods used to develop emissions inventories and to calculate emission reductions so that these records could be audited if a report is challenged?

B. Verification methods, Should independent verification include on-site inspections of processes, data and/or equipment? Should the verification methods used be comparable to those used by financial auditors, or should they be comparable to those used by facility health or safety inspectors?

C. Approving/certifying verifiers

- i) Should all participants be required to have an independent organization verify their emissions inventory and their estimated emission reductions?
- ii) If it is decided to use independent verifiers, what types of organizations are qualified to serve as independent verifiers? How might these organizations be identified?

D. Confidentiality issues

- i) Should all data be available for review by government representatives?
- ii) Should non-government organizations be able to review the data upon which emission reports or claimed emission reductions are based?

VII. Managing the Registry of Emission Inventories and Reductions

- A. Certifying real reductions.** Once DOE has received a report that has been independently verified to be in compliance with the revised guidelines, what actions should it take? What should DOE provide to entities that have successfully met the requirements of the new, more rigorous guidelines?
- B. Tracking and transferring reductions.** How should DOE identify the entity responsible for specific emission reductions and when should DOE transfer this responsibility to a different entity? For DOE to transfer responsibility for a credited emission reduction from one entity to another, what should DOE require from the entities involved?
- C. Confidentiality issues.** Should data submitted to DOE be made publicly available? Can DOE effectively protect confidential data?
- D. Prior year reports.** What should DOE do with the reports already submitted under the existing guidelines? Should previous reporters be permitted to redo prior-year reports to comply with the revised guidelines? Should DOE permit entities to document prior year emission reductions (under the new guidelines), regardless of the year in which they were achieved? Should DOE keep separate records for those reports under existing guidelines and new records for those reports under the new guidelines?

3. ORGANIZATIONAL BOUNDARIES

Voluntary Greenhouse Gas Reporting Workshops

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

BACKGROUND PAPER: ORGANIZATIONAL BOUNDARIES

I. Background on Organizational Boundaries

“Organizational Boundaries” is, in part, an attempt to define who or what may report to the Voluntary Greenhouse Gas Reporting Program (VGGRP), and, in part, an attempt to define which emission sources and reductions really “belong” to a particular reporter. In some cases, organizational boundary choices are obvious. In others, there are numerous possible alternatives. Consistent choices are organizational boundaries can help improve the program consistency, comparability and credibility.¹

A. What is an Entity?

The language of the Energy Policy Act of 1992 describes the organization that is able to report as “an entity.” In the current 1605(b) program, an entity is defined as a “U.S. legal person.” In practice, an entity is usually a corporation, but may also be a household, a public body, or a project developer, or a facility or project. The intended public purpose of the revised program may suggest differing, possibly more restrictive, definitions of a reporting entity. The list below suggests some of the more common possible definitions of a reporting entity. Note that all of these definitions are acceptable under the current program, so they are not necessarily mutually exclusive.

- i) An entity is a facility. This definition is usually favored by “cap-and-trade” programs, such as the sulfur trading program under the Clean Air Act Amendments. Emissions and emissions intensities from individual facilities can be volatile, even when corporate emissions are relatively stable. If all facilities are capped, as they are under the sulfur trading program, the “noise” of fluctuations in the emissions of individual facilities is unimportant. In a voluntary program, a facility-based program may be subject to selection bias – reporters only report on those facilities with declining emissions (emission intensity). This approach is relatively well suited to stationary sources, but implies millions of participants for small distributed sources, and may not be meaningfully implement able by area sources and mobile sources.
- ii) An entity is a group of facilities with common ownership or operational control. The “group of facilities” approach reduces, but does not eliminate, selection bias from substitution between similar facilities. It retains the difficulties in reporting mobile and area source emissions.
- iii) An entity is a corporation or other legal body. This definition accounts for a significant portion of current emissions reporting. It is amenable to some area source and transportation emissions reporting. It also matches management the scope of reporting to

¹ See *Background Papers: Project Emissions Databases and Reductions; Direct and Indirect Emissions; and Emissions Intensity and Other Baseline Measures* for related topics.

the scope of management authority. On the other hand, mapping emissions sources to legal ownership inevitably creates ambiguities.

- iv) An entity is an industry. From time-to-time, some industries have considered reporting collectively, as a group. In the current 1605(b) database, the International Waste Services Association actually does report collectively. Collective reporting is often very difficult to negotiate if the members firms are competing with one another.
- v) An entity is a project or activity. This definition usually assumes that reported emissions and reductions are those “caused” by the project or activity, rather than those “owned” by the owner/operator of the project. This definition links reductions directly to purposive action, which are both an advantage (people are rewarded for known, specific, actions) and a disadvantage (determining causation is always problematic and subjective, leading to difficulties in objectivity and verification, and hence credibility). *See Discussion Paper: Project Reporting.*

B. Which Corporation or Legal Body is the Reporter?

A corporation or legal entity may have multiple levels of ownership, may stray across political boundaries, or have multiple independent lines of business. In these cases, it is not always obvious which permutation of the entity ought to be the reporter of record. Different kinds of legal bodies raise different sorts of issues.

- (i) Corporations. Other corporations, of course, may own corporations. Reporting emissions from a single facility, or from a single subsidiary of a parent corporation, may be potentially viewed as less than comprehensive. Some possible guidance that the DOE might be able to offer might include:
 - a) Any permutation of a corporation may be permitted to report: subsidiary, facility, or the whole corporation.
 - b) No single facilities rule. If a firm owns multiple facilities that are in the same line of business, the firm must report from all similarly situated facilities or none.
 - c) Downward Completeness rule. If a legal entity reports, all subsidiaries of that facility must report. This rule might exist as an absolute requirement, or subject to a materiality provision.
 - d) National or Worldwide. All U.S, (or world) activities of a reporter must report, including corporate parents and siblings. This rule might exist as an absolute requirement, or subject to a materiality provision.
- (ii) Public Bodies. Public bodies are particularly complex because they exist at multiple levels, and the scope of their responsibility is unclear. For instance, several municipal Governments are “entities” under the VGGRP. However, municipal Governments that are usually municipal electric utilities, and they tend to report only the emissions of their electric utility arm, rather than the emissions of the municipal Government per se, or the emissions of all private activities within municipal boundaries. This problem can be

recognized as an analogue to the problem of subsidiaries and unrelated lines-of-business in the private sector. Options for dealing with public bodies include:

- a) Public bodies choose the form in which they report;
- b) Public bodies must report all emissions by agencies or other public bodies deriving their legal authority from the reporting body (downward completeness), possibly subject to a materiality rule;
- c) Public bodies must report all emissions by agencies or other public bodies deriving their legal authority from the reporting body, and all emissions from any public body which created the reporting body, plus any other agency or public body created by the creator of the reporting body, possibly subject to a materiality test;
- d) Public bodies may/may not report on behalf of private entities within their jurisdiction.

(iii) *Federal Government*. The ultimate complexity lies with the Federal Government.

Around 7 percent of U.S. electricity is generated by the Federal Government, through the Tennessee Valley Authority (TVA) and various Power Marketing Administrations (PMAs), such as the Bonneville Power Administration. In addition, the Department of Defense alone accounts for several percent of U.S. emissions. The U.S. Department of Agriculture has considered the idea of reporting emissions and sequestration associated with various USDA programs. Options for addressing these emissions include:

- a) Federal agencies choose the form in which they report;
- b) Federal agencies may not report;
- c) Federal agencies must report at the highest possible level, limited to complete Cabinet Departments, but not the Executive Branch as a whole;
- d) Federal Agencies may/may not report on behalf of private entities within their jurisdiction.

C. Treatment of Subsidiaries in Corporate Reporting

Many firms have multiple lines of business, and diverse legal arrangements for controlling these lines of business. It is broadly agreed that fully owned subsidiaries, directly managed subsidiaries in one of the reporter's principal lines of business ought to be included. However, as these conditions weaken, the case for inclusion also weakens. There are two separate questions: (1) When might a subsidiary be excluded; and (2) Assuming a subsidiary is included, if the subsidiary is only partially owned by the parent, in principal, emissions will need to be divided between the various owners according to some principle. What principle should be applied?

- i) *When might a subsidiary be excluded?* In principal, subsidiaries ought to be included. Financial accounting principles require consolidation of subsidiaries with greater than 50 percent ownership, while subsidiaries with less than 50 percent ownership may be consolidated, or may be carried as an arms length investment. In general, it would be reasonable to expect that corporate emissions reporting would match corporate financial accounting. However, there are several practical issues:

- If the subsidiary is subject only to “arms length management,” and/or the parent’s proportionate stake in the subsidiary is small, the parent may have little or no information about the emissions of the subsidiary, and no influence on day-to-day operations.
- In many cases, emissions (or pro-rated emissions) of such subsidiaries may be tiny, implying a difficult choice between losing material information through accounting convention or requiring disproportionate effort for non-material information.

In coping with these practical problems (lack of information or tiny emissions), some of the options for prospective guidance might be:

- a) Include all subsidiaries. Benefits: completeness, consistency, no ambiguity. Costs: may collect small emissions numbers at high cost.
 - b) Include all subsidiaries with *material* emissions.² Nearly as complete, but definition of materiality raises a second set of problems. How do you know whether emissions are material unless you already know the emissions? Who defines material? How is it defined?
 - c) Reporter chooses which subsidiaries to report, based on the reporter’s judgment on ownership share, materiality, cost, and corporate information flows. This is the current situation. Reasonable, except that, as in other cases, this option will probably reduce credibility disproportionately.
 - d) As above, with judgment subject to challenge via verification.
- ii. *Pro-rating subsidiary emissions.* Assuming the emissions of a partially-owned subsidiary are to be included, then it is necessary to decide the principle upon which the emissions of the subsidiary are divided among the several owners. In general, emissions accounting ought to follow financial accounting (i.e., pro-rating emissions by ownership share.). However, energy companies (i.e., potentially large emitters) can have very complex ownership and operational relationships:
- Several companies jointly own a particular power plant or oil field. One firm (“the operator”) operates the facility on behalf of the several owners. The operator usually but not always owns the largest single share. The product may be sold or distributed in patterns different from actual ownership shares, with owners receiving a mixture of cash and output. Operators are sometimes less than fully forthcoming in providing owners detailed operating information, such as might be necessary to calculate emissions.

² “Materiality” is a concept drawn from financial accounting. A material fact is, roughly, “big enough to make a difference.” A similar concept in emissions accounting is often called “de minimus.”

- Output may be distributed to entities that do not have a formal equity ownership share, in the form of “royalties” or “over-riding interests.” In reserve recognition accounting, these claims on output are deducted from equity reserves.
- International oil and gas production in many countries is based on “production sharing agreements” which are functionally income or production taxes, but are legally structured as joint ventures. The accounting treatment of these agreements is not consistent across companies. There also similar agreements structured as “service contracts.”

In designing guidance that may be helpful in coping with these practical problems, there are several options:

- a) Emissions reported proportionate to equity ownership. If, however, output is directly related to emissions, and output shares differ from ownership shares (as in intensity or unit-of-production reporting), then individual owners will have reported emissions that differ from their actual use of the product. Operator may not be forthcoming with information.
- b) Emissions reported proportionate to output share. Since some output may be sold as royalties or on spot market, output shares may not add to 100 percent. Operator may not be forthcoming with information.
- c) All emissions reported by operator, no emissions by non-operator. Solves information problem, at cost of underreporting by other owners. Year-to-year volatility if operator changes. Double counting if accounting principles differ across owners.

D. Contracting Services in Corporate Reporting

Contracting is a special case of the more general problem of outsourcing or vertical integration. Every firm relies on a web of suppliers of specialized goods and services. The output of most firms is an input to some other firm. Some of these services (for instance, transportation) are relatively emissions intensive. Firms that are vertically integrated with respect to emissions-intensive services will have greater emissions intensity than firms that contract such services, and can reduce their emissions intensity by outsourcing the emissions intensive service.

Some outsourcing is more apparent than real. Many electric utilities sign firm, multi-year contracts for 100 percent of the output of a particular plant that is constructed for the purpose of providing electricity under the contract. Oil companies will charter tankers on multi-year contracts. Many firms lease vehicles for corporate use.

Options for guidance on contracting services includes:

- i) Exclude contracted services from the reporter’s emissions. In this case, the contractor is responsible for his own emissions. This approach is unambiguous and doesn’t require the

reporter to obtain information from some other company. There is no chance of the contractor and the reporter reporting on the same emissions. However this approach may not produce complete picture of some reporter's emissions footprint.

- ii) Include contracted services in the reporter's emissions if the emissions from the service are a) material and b) for the long-term sole or predominant use and benefit of the purchaser. This is a more ambiguous approach, since it will now be necessary to define "material," "long-term," and "sole or predominant." Getting emissions information from the contractor may be problematic, but if the purchaser is a genuinely a really big customer, should be possible. Possible issue of double-counting with contractor's operations.
- iii) Contracted services are included if the emissions from the service are material. This might seem to be less ambiguous, but there is no obvious point at which to stop including emissions, with growing potential for double counting. Severe information and verification problems.
- iv) Contracted services are included at the discretion of the reporter. (Most reporters choose not to include contracted services). This is the current situation. May affect credibility.
- v) Contracted services are included if the reporter buys the fuel. This is an information-centric approach to the question.

F. Acquisitions and Divestitures

Acquisitions and divestitures may be considered either a corporate boundary issue or a baseline issue. The underlying issue is that a corporation, as a legal body, can and will evolve over time, buying and selling facilities or whole lines of business. Some production processes will be far more emissions-intensive than others, and some lines of business will be far more emissions intensive than others. Acquisitions and divestitures can thus have a substantial material impact on a firm's emissions over time.

Firms that can use intensity or unit-of-production baselines are better adapted to the view that acquisitions and divestitures are a situation, since output will be added or subtracted along with the acquisition or divestiture. However, it may turn out to be difficult or impossible as a practical matter to develop intensity baselines for every firm.

For firms that cannot use intensity baselines, there are really four possible approaches:

- i. Do nothing. Accounting for acquisitions and divestitures is a solution that is worse than the problem.
- ii. "Pro forma" current period accounting. Assume that emissions today (for purposes of calculating a reduction) are based on the set of assets or facilities owned by the reporter during some base year, based on excluding emissions from assets acquired during the base year, and including actual or inferred emissions from assets divested during the base

year. Note that this requires determining emissions from assets no longer owned by the reporter, which may pose a problem.

- iii. “Pro forma” historical period accounting. Assume that emissions during the base year (for purposes of calculating a reduction) are based on the set of assets or facilities owned by the reporter today, with base year emissions from divested assets excluded, and base year emissions from acquired assets included. This requires determining emissions from assets from periods prior to their acquisition, which may pose an information problem.
- iv. “Pro forma” accounting, subject to a materiality test. As above, but emissions from acquisitions and divestitures may be excluded if they can be shown to be non-material.

F. Leased Facilities

The treatment of leased facilities, which, in principle might be extended to vehicles and ships, is somewhat analogous to the treatment of contracted services. In the case of contracted services, the reporter owns the facility, while, another firm provides the services. In the case of leased facilities, the facility is provided by another firm, while the parent provides services.

There are several options:

- i) Leased facilities or vehicles have their emissions reported by the owner. Unfortunately, the owner may know little about the operations of a leased facility.
- ii) Leased facilities have their emissions reported by the operator. This solves the information problem, but is a wrinkle in the principle of ownership.
- iii) Leased facilities have their emissions reported by the party that purchases the fuel. This principle follows the information. The party that purchases the fuel can always calculate emissions, and will usually be the operator. However, one can imagine some infuriating “gray areas.”

4. DIRECT AND INDIRECT EMISSIONS

Voluntary Greenhouse Gas Reporting Workshops

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

BACKGROUND PAPER: DIRECT AND INDIRECT EMISSIONS

I. Background on Direct and Indirect Emissions Background

The concept of direct and indirect emissions was invented to contrast the consequences of two alternative theories of “responsibility” for emissions. A “direct” emission can be defined as an emission from a source “owned” or “controlled” by a particular legal person. Most current regulation of stationary sources of emissions is based on the regulation of direct emissions. The emission source is identified, the owner or operator of the source is identified and then required to comply with the applicable regulation.

On the other hand, “indirect” emissions are more amorphous, and have their origin in cost-benefit analysis or environmental impact statements. Here the notion is that a particular action “causes” an emission or reduction to occur somewhere else. Regulation of indirect emissions is less common than regulation of direct emissions, but still occurs. For example, regulation of refiners’ gasoline quality is aimed at causing reductions in tailpipe emissions of automobiles owned by households. Indirect emissions are thus regulated as a matter of effectiveness or administrative convenience.

In the current Voluntary Greenhouse Gas Reporting Program (VGGRP) reporters are encouraged to report both direct and indirect emissions and reductions, but to clearly distinguish between the two types of emissions. There are many possible types of indirect emissions, but, in practice, there are only a few sorts of indirect emissions that appear to be of practical importance:

- In the United States, electric power generation accounts for about a third of U.S. greenhouse gas emissions, while electricity consumption accounts for a large fraction of U.S. energy consumption. Thus, indirect emissions from electric power consumption account for a large portion of many reporters’ emissions “footprint,” particularly in light manufacturing (including electronics) and in the service sector.
- Manufacturers of transportation vehicles and energy consuming appliances affect the emissions of the consumers and firms that use their products.
- Energy Service Companies, and Utility Demand Side Management programs work by reducing the electricity or fuel consumption of consumers,
- Renewable energy producers reduce the emissions of their fossil-fired competitors;
- There are large greenhouse gas emissions associated with the production of energy and raw materials, as well as intermediate products such as steel, aluminum, glass, cement, and chemicals. Thus, many products (for example, automobiles) can be viewed as containing “embedded emissions” in the form of the emissions required to manufacture the raw materials used in the product. Calculation of these “embedded emissions” are

sometimes called “fuel cycle emissions,” and they are, by definition, indirect emissions. In principle, reducing fuel cycle emissions would create an indirect reduction.

III. Issues

How direct and indirect emissions ought to be treated by a revised 1605(b) program depends largely on one’s view of the relative importance and applicability of the following factors:

- A. Providing incentives.** How important is providing incentives to a particular source of indirect emissions? In a cap-and-trade program, some emissions are “capped,” while consumers “downstream” of the cap receive a “price signal.” In a voluntary program, downstream consumers do not receive a price signal, so that their behavior is unaffected unless the voluntary program is extended to them.
- B. How serious a problem is double-counting?** In a system where both direct and indirect emissions are included, the same emissions may be counted both as direct emissions (by the owner of the source) and as indirect emissions (by the consumer). This is a fatal defect in cap-and-trade, and undesirable in a voluntary program, but the “cost” of double counting should be balanced against the “benefit” of providing direct incentives.
- C. Can the reporter measure indirect emissions?** The reporter of indirect emissions, by definition, does not own the emissions source. Hence, the reporter will not necessarily have the information necessary to compute his emissions. Depending on the particular source of indirect emissions, the severity of this problem ranges from the trivial to the acute.
- D. Can indirect emissions be measured at all?** The computation of indirect emissions always contains an element of causation. In some cases (electric power) the chain of causation is clear and direct, and inferring emissions is relatively straightforward. In other cases (embedded emissions in physical products) the chain of causation is complicated and ambiguous. It is not always clear, even conceptually, what ought to be measured. Once again, depending on the source, this problem can range from the trivial to the acute.

In order to maintain the credibility of the revised program it is desirable that calculations of emissions and reductions be straightforward, verifiable, and that, to the extent possible, that material decisions about what is to be included or not included in “emissions” not be under the control of the reporter.

IV. General Treatment of Indirect Emissions

There are several options for the treatment of direct and indirect emissions under a revised program:

- A. Exclude indirect emissions.** This option presumes the importance of limiting double counting outweighs the incentive effects of including indirect emissions.

- B. Exclude indirect emissions from entity reporting, but permit inclusion for projects.** This option limits double counting, but also pushes most service industries and manufacturing out of the entity-reporting program.
- C. Include or exclude indirect emissions at the option of the reporter.** This is the rule that is currently used in the VGGRP. The difficulty with this approach is that when indirect emissions are material (as they often are), the reporter's choice can have a large influence on the outcome.
- D. Differential treatment by industry or sector.** Some industries or sectors are required to report only indirect emissions, while other industries or sectors are constrained to report only direct emissions, chosen so that double counting is minimized. This approach mimics a downstream or hybrid cap-and-trade system, and is approximately the approach adopted by the British Government for their trading program.
- E. Direct emissions are included, along with particular identified indirect emissions (e.g. electricity). Other indirect emissions are excluded.** This approach presumes that the incentive aspects of the program outweigh the double counting costs. It adds to the complexity of the Guidelines, because DOE must take on the task of identifying which indirect emissions ought to be included and how such emissions should be reported.
- F. All emissions, both direct and indirect, must be reported.** Because everything is inter-related, somebody must decide in practice when the inter-relationship is too tenuous to warrant reporting. This approach probably would devolve into a specification something like: all direct emissions plus *a long list* of specified indirect emissions must be reported. Adopting this approach would probably require DOE to take on the task of identifying the elements in the long list of specified emissions, plus ways of estimating emissions from the sources in that long list.

V. Treatment of Specific Indirect Emissions

Most of the options listed above presume that some indirect emissions will be included in entity emissions reporting, while others will be excluded. In thinking through how such differential treatment might be implemented, it might be helpful to consider the most effective ways to treat particular types of indirect emissions. This may help illuminate the issues raised by a more general decision about how to treat indirect emissions.

- A. End user electricity consumption.** For households and many industries, end use electricity consumption is the largest fraction of the emissions footprint, and a fraction that is highly amenable to control by the consumer. The consumer also knows (because he/she receives a bill) how much electricity he/she consumes. On the other hand, the consumer usually has no control over the mix of sources used to make the electricity consumed. However, in an intensity based system, the generator gets reductions based on emissions per unit of production, while the consumer ought (in principle) to be presented with an external emissions factor which could change over time (to better reflect changes

in emissions impact) or be fixed at the baseline year (to isolate the impact of changes in emissions per kilowatt hour from the impact of changes in the consumer's electricity consumption. Thus, the options are:

- i. Report direct emissions only.
- ii. Consumers report electricity emissions based on their best estimate of generator's current unit emissions.
- iii. Consumers report electricity emissions based on the best estimate of generator's emissions during a particular baseline year.

B. Wholesale electricity transactions. Regulated electric utilities purchase and sell large amounts of electricity; some via spot or power exchange transactions, some via long-term contracts from dedicated suppliers, and from intermediate arrangements. These transactions could be accounted under multiple principles:

- i. Report direct emissions only.
- ii. Electricity to supply customers (i.e., direct emissions plus indirect emissions from wholesale purchases, less indirect emissions from wholesale sales).
- iii. Contractual indirect emissions (i.e., direct emissions plus indirect emissions from long-term).
- iv. Indirect emissions only (e.g., T&D utility is responsible, not the generator).

C. Manufacturers of emission-reducing capital equipment. Manufacturers of energy saving capital equipment (for example, compact fluorescent lightbulbs) are sometimes seen as potential reporters. This particular form of indirect emissions produces a range of complicated problems, including:

- Divided responsibility and prospects for double counting. There are many potentially responsible parties other than the manufacturer, including the consumer, Government regulators, distributors, ESCOs, etc.
- Difficulty in estimating emissions and reductions (the manufacturer will often not have specific information about who buys their product, how it is used, or how long it lasts), and, in many cases, even the ultimate owner will not have records—i.e., nobody records lightbulb usage.
- Timing of emissions and reductions. The manufacturer sells his product in year one, but the product (presumably) goes on to a long and productive life, yielding reductions over a period of years, and, at some point in the future, is retired and replaced. When would the manufacturer get credit? A capitalized measure of

future reductions, taken at the time of sale, or a stream of small reductions based on estimated or actual product lifetime?

- Linkage (if any) to corporate emissions. The manufacturer of the product may have corporate emissions; but these corporate emissions are basically irrelevant to the performance of the product, and only marginally relevant to the quantity sold. Hence, it is not obvious how one should interpret the sum of corporate emissions and emission reductions achieved by others from the sale of the reporter's product.

The likely options in this case would seem to be:

- i. Manufacturers are not directly credited for reductions caused by the performance of their product.
 - ii. Crediting through projects only. This may still entail double counting, and emission estimation problems. However, it does separate entity reporting from manufacturer reporting, and the Department of Energy might require that reported project reductions be limited to reductions that are not also claimed by the entity reporting of other participants.
 - iii. Pro-rata crediting of indirect emissions and/or reductions from capital equipment (on either a compulsory or discretionary basis). Manufacturers are credited according to some sort of proportional formula that allocates responsibility among potential claimants. An "accurate" formula is impossible. An "arbitrary" formula might be negotiated.
 - iv. Full crediting of indirect emissions and/or reductions from capital equipment by the manufacturer at the discretion of the reporter. This is the decision implemented in the current program. In practice, however, crediting of this form of emissions at the entity level is extremely unusual, and uncommon at the project level.
 - v. Compulsory full crediting of indirect emissions, possibly with reporting of direct emissions excluded to limit double counting. In this case, manufacturers must report on the indirect emissions and/or reductions for their products. This model has been occasionally suggested for the automobile industry.
- D. Fuel Cycle Emissions.** This is a term of art describing the estimation of the emissions "embedded" in particular inputs. For example, the fuel cycle emissions of an airplane would include the emissions used in smelting the aluminum that went into the airframe, the steel in the engines, the rubber in tires. Fuel cycle emissions are analytically useful in determining the environmental consequences of product substitutions. For example, building a car out of aluminum reduces vehicle weight and improves fuel efficiency, hence reducing emissions. On the other hand, the emissions "embedded" in the aluminum are much larger than the emissions

“embedded” in steel. A complete fuel cycle analysis would trade off the reduced lifetime emissions of the lighter weight vehicle against the higher immediate construction emissions. Counting or crediting fuel cycle emissions in the context of a quasi-regulatory program, however, presents some challenges:

- Consumers usually don’t know the emissions intensity of the products they use, nor will they have any convenient way of finding out. This probably means that the Department of Energy must develop, issue, and update standard emission coefficients.
- Calculation of product emission intensity is complicated, and, in many cases, inherently subjective. As noted elsewhere, calculation of the emissions intensity of complicated products (like integrated circuits or engineered plastics) is a daunting technical challenge. Even for simpler products, different manufacturers will have different emissions intensities, and emissions intensity may vary over time for arbitrary reasons. Which intensity one chooses can determine whether one’s emissions are growing or shrinking.
- The complexity and subjectivity of estimating fuel cycle emissions would make reporting much more costly and much more difficult to verify. If reasonable people can reasonably disagree about the quantity of embedded emissions in, say, polyethylene, how can a verifier determine which is the “right” number to be included in a report? DOE provided coefficients ameliorate (but do not eliminate) this problem.
- Systematic use of fuel cycle analysis will produce multiple counting, since firms at multiple levels in the production process may choose to report. One could ameliorate this problem by limiting the types of firms who are permitted to report. (For example, by excluding raw materials producers). This solution, of course, reduces the incentive effects of the voluntary program.

The options include:

- i) Exclude fuel cycle emissions reporting.
- ii) Include fuel cycle emissions reporting, with certain specified exceptions.
- iii) Include fuel cycle emissions reporting at the discretion of the reporter. This is the option currently chosen. The current 1605(b) guidelines encourage fuel cycle reporting, but in practice, fuel cycle reporting is almost unknown, due the information difficulties described above.
- iv) Fuel cycle emission reporting is compulsory, possibly coupled with restrictions on “who can report” to limit multiple counting. In this instance, it probably would be best if the Department of Energy developed a set of

standard emission coefficients for the more common products (steel, cement, aluminum, polyethylene, etc.) to make reporting more verifiable.

5. EMISSIONS INTENSITY AND OTHER BASELINE MEASURES

Voluntary Greenhouse Gas Reporting Workshops

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

BACKGROUND PAPER: EMISSIONS INTENSITY AND OTHER BASELINE MEASURES

I. Introduction to Emission Intensity and Other Baseline Measures

Perhaps the central issue that must be resolved to create a credible mechanism for identifying emissions reductions is the method(s) used to establish the baselines (starting points) from which emission reductions are calculated. This is true regardless of whether reductions are based on changes in actual emissions (absolute tons), changes in emissions intensity (emissions per unit of output) or on some other method. Baselines can be fixed (unchanging) or dynamic (adjusted over time). There are three basic approaches to deriving baselines:

- **Actual Emissions Baselines.** Under this approach, a company might use its actual emissions in 2003 (or some other base year) as its baseline. If its emissions in future years fell below those in 2003, then it would claim a reduction based on the difference between emissions in future years and those in 2003. Actual measurements might also be used to establish baselines for certain projects, such as the amount of electricity produced from wind, or number of trees planted, although the quantities measured usually require conversion to greenhouse gas-equivalents.
- **Emissions Intensity Baselines.** Under this approach, measures of emissions intensity would be used to exclude the effects of changes in output on emissions. For example, an electric generator might measure its actual emissions per kilowatt hour (kwh) produced (emission intensity) in a given year and use this baseline to calculate its reductions if it reduced its intensity in future years.
- **Calculated Baselines.** Under this approach, estimates of the additional emissions that would have occurred if a particular project or action had not been undertaken would serve as the baseline. Such estimates might be based on standardized tests of a particular technology or on engineering-based assessments.

Each of these three approaches to setting baselines has various strengths and weaknesses and each might have some role under more rigorous guidelines for measuring emission reductions.

II. Baseline options

A. Actual Emissions Baselines

This is perhaps the simplest approach to setting baselines. To establish a fixed baseline using actual emissions requires only an accurate inventory of emissions.

Advantages:

- Virtually all companies and other entities can measure their actual emissions (annually or over some other specified time period).
- Confidentiality is likely to be less of a concern if actual emissions, rather than output-based measures, are used.
- Independent verification of actual emissions is likely to be easier.
- Actual measurements of emissions/output/sequestration may be especially effective when applied to certain "projects", such as a new wind generator or a measurable sequestration project.
- Actual measured emissions may also be appropriate for greenhouse gases for which emission controls or non-greenhouse gas substitutes are available.

Disadvantages:

- Companies or other entities growing rapidly will have a much harder time achieving absolute reductions in their emissions than companies growing more slowly or not at all.
- Companies growing rapidly might not qualify for emission reduction credits, even if they made major investments to improve efficiency and shift to less carbon-intensive fuels.
- Companies/facilities with declining (U.S.) output are likely to be able to claim emission reductions even if they are taking no actions to cut emissions through improved efficiency, the use of less carbon-intensive fuels or other means.

Possible alternatives: Actual measured emissions can be adjusted using emissions intensity values to exclude the effects of changes in the level of output of a particular product (and other methods might be used to control for weather changes or other outside influences).

B. Emissions Intensity Baselines

The several output-related weaknesses of absolute emission baselines have led many to advocate the use of emissions intensity or other methods of controlling for changes in output. It might also be possible to adjust emission baselines to take into account certain other factors that affect emissions, such as annual changes in weather.

The President's February 14, 2002, statement, subsequent interagency discussions, and the July 8th letter to the President emphasized the importance of using emissions intensity as the basis for tracking the progress of the country, utilities, corporations and others in limiting greenhouse gas emissions.

By deriving emission reductions from changes in emissions intensity, participants in the voluntary reporting program would be able to be credited for emission reduction if their output (production) increased more rapidly than their emissions. Similarly, entities that reduced their emissions only because they reduced production (e.g., as a result of reduced sales, divestiture or shifts in production to non-U.S. plants), would not be credited.

Definition of greenhouse gas emissions intensity: emissions per unit of output. Emissions could be direct only or direct and indirect, one gas or multiple gases. Output could be either physical (widgets) or economic (dollars).

i. *Entity-wide measures of intensity, based on entity-wide measures of physical output.* A common definition is total emissions of a corporation or other entity per unit of physical output (e.g. utility X's emissions per kwh, corporation Y's emissions per ton of cement; or university Z's emissions per student).

Advantages:

- Good indicator of changes in greenhouse gas emissions that are independent of changes in output.
- Automatically adjusts for increases or decreases in production, regardless of the cause, e.g. increased sales; divestiture.
- Reflects all changes in emissions that occur within the reporting entity, and would recognize only net reductions.
- Enables a distinction between emissions reductions that result from improved energy intensity (Btus/unit of output) versus the greenhouse gas emissions intensity of the fuels utilized.

Disadvantages:

- Significant year-to-year changes in emission intensity can be caused by temporary shifts in capacity utilization, raw materials or weather.
- Most companies have multiple types of business lines and/or multiple products, so they have no single physical measure of output that can represent the output of the whole corporation.
- Does not account for changes in emissions intensity that result from outsourcing of various elements of the production process.
- Does not account for the changes in the emissions intensity of electric utilities that result from the sale or purchase of existing power plants.
- Inter-company comparisons can be misleading because of differences in raw materials (e.g., virgin or recycled), product characteristics (e.g. qualities of steel) or in the degree of vertical integration of production (on-site manufacturing or purchase of parts manufactured offsite)
- Risks divulging information that some companies consider proprietary for competitive reasons.

Possible alternatives:

- Alternatives to Physical Measures of Output: There has been some consideration of economic measures (such as value added) as an alternative to physical measures of output. Preliminary analyses have shown, however, that economic measures are likely to result in even larger year-to-year fluctuations that are not indicative of actual changes in physical output or emissions. Dollar measures of intensity will vary when product / raw material prices and other factors vary, producing fluctuations in intensity that are unrelated to either output or emissions. However, an emissions intensity measure averaged over several years rather than tied to a single year can minimize these effects. In addition, many potential reporters (non-governmental organizations, government bodies, households) may not have meaningful fiscal measures of output.
 - Alternatives to Entity-wide Measures of Output. If there is no single physical (or economic) measure of an entity's total output, it may be possible to identify useful measures of output for business lines or individual plants.
- ii. ***Business-line or plant-specific measures of intensity.*** Companies or other entities that have no single, entity-wide measure of output may be able to measure the output of specific business lines or plants, and use such data to track changes in emissions intensity and to calculate the emission reductions achieved by different segments of the reporting entity. Commonly defined as emissions of a business line, single plant or other facility per unit of the physical output of that business line, plant or facility.

Advantages:

- Good indicator of changes in greenhouse gas emissions that are independent of changes in output.
- Corporations with multiple business lines could still use emissions intensity measures to derive estimated emission reductions.
- Adjustments for plant or business-line changes can be made more easily

Disadvantages:

- Year-to-year changes can be significantly affected by temporary shifts in product characteristics, raw materials or weather.
- If applied by an entity to only selected plants or facilities, may lead to a "self-selection" bias that over emphasizes sites where significant reductions in intensity have been achieved, but ignores areas where emission intensity has remained stable or increased.
- Does not automatically account for changes in emissions intensity that result from outsourcing of various elements of the production process

(either to other parts of a corporation or outside the boundaries of the corporation).

- The products of particular business lines or even individual plants are often so variable that no single, meaningful measure of output can be defined, matched to the associated greenhouse gas emissions and tracked from year-to-year.

Possible alternatives:

- Alternatives to physical measures of output and emissions - projects: In situations where it is not possible to match actual emissions to any single measure of output, it may be possible to estimate the emission reductions likely to result from certain identifiable actions or projects, such as the installation of energy efficient lighting or a shift from one technology for producing process heat to another. Often such estimates are based on fixed assumptions regarding output, and on estimates of pre and post energy consumption (usually based on engineering analyses or controlled tests).
- Alternatives to output-adjusted estimates of emission reductions - actual emissions: If no output-adjusted measure or estimate of emission reductions is feasible or desired, then changes in total emissions of specific plants or buildings might be used to calculate emission reductions – although changes in output levels, raw materials or products could substantially change the emissions of individual plants over time.

C. Calculated Emissions Baselines

Calculated emissions baselines are often used to estimate emission reductions associated with many "Projects". Usually such calculations are based on the estimated or tested performance of one technology relative to some other technology, such as the emission reductions associated with the installation of a new energy efficient lighting system or the installation of a new industrial process.

Advantages:

- Calculation of baselines and performance can usually exclude the effects on emissions of factors that are not to be credited, such as changes in year-to-year output or weather.
- Project-based estimates provide assurance that the entity being credited has actually taken identifiable actions to reduce greenhouse gas emissions, thus excluding emission reductions that may have resulted from factors outside the control of the reporting entity.

Disadvantages:

- Many of the actions that result in reduced emissions are not easily identified and evaluated, such as changes in the operations and maintenance of a particular process, or dozens of small investments in new equipment or materials.
- Basing emission reduction estimates on specific projects provides no assurance that emission increases in other areas are not offsetting the reported reductions.
- Estimated performance is not always an accurate indicator of actual performance, especially over time.
- Likely to require estimates of the expected useful life of a particular technology (or action), with no easy way of monitoring the actual utilization and performance of the technology over time.
- Would require DOE and/or independent verifiers to determine the legitimacy of the estimated emission reductions likely to result from potentially hundreds or even thousands of different technologies/actions.

D. Fixed or Dynamic Baselines

Any baseline can be fixed (unchanging) or dynamic (shifting over time to reflect business-as-usual improvements in technology and productivity). An intensity measure used for a baseline could reflect the specific fixed GHG intensity level of a particular year or it could be a dynamic reference point reflecting an observed or projected trend of emissions performance over many years. Assessment of emissions intensity performance might then be either the absolute change in emissions intensity, or the improvement relative to the referenced trend.

- i. *Fixed Baselines.* Under this approach, all emission reductions would be calculated from baselines derived from emissions, emissions intensity, or the performance of a single technology associated with a particular year (the base year) – or an average of several years. The base year (or period) could be determined by each participating entity or could be specified by DOE.

Advantages:

- Can be objectively determined, based on actual emissions, output or other factors;
- Does not attempt to distinguish between emission reductions that are "business-as-usual" and those that are not; and
- Would be parallel to the President's goal of reducing emissions intensity 18% by 2012, relative to U.S. emissions intensity in 2002.

Disadvantages:

- Industries or other entities that are experiencing rapid technological change are likely to find it easier to achieve significant reductions in emissions intensity than entities that are dependent on mature technologies;

- Provides equal credit to emission reductions that result from the normal turnover of capital equipment and emission reductions that result from special actions undertaken by participating entities to reduce emissions; and
 - Credited emission reductions would not necessarily reduce PROJECTED U.S. or global emissions of greenhouse gases.
- ii. *Dynamic Baselines.* Using this approach, there would be no fixed base year. The emissions or emissions intensity baseline from which emission reductions would be calculated would change over time. The rate of change could be based on many different factors, such as the historical rate of changes in U.S. emissions intensity, the historical rate of change in the emissions intensity of particular industries or processes, or could be automatically changed in order to prevent entities from claiming previous emission reductions indefinitely (e.g., a 5 year lag). Most dynamic baselines are a projection of the emissions that would have occurred had action(s) to reduce emissions not been taken.

Advantages:

- Could be designed to exclude most "business as usual" emissions intensity reductions.
- Would preclude industries/entities from claiming ever increasing quantities of emission reductions over time.
- Would be a better indicator of likely reductions in PROJECTED emissions.

Disadvantages:

- Dynamic baselines derived from historical emission intensity trends of an industry are often not good indicators of the most likely business-as-usual trend for a particular firm or even the industry.
- Dynamic baselines derived from industry averages may penalize industries that are composed primarily of companies committed to reducing greenhouse gas emissions.
- There is often insufficient data to derive useful historical or current trends from which dynamic baselines for an industry or group of companies could be derived.
- The validity of dynamic baselines cannot be objectively verified because they are counter-factual (they estimate the emissions that might have occurred in the absence of additional actions to reduce emissions), so disputes may be difficult or impossible to resolve.

E. Base Years

The base year is either the year used to establish a fixed baseline or the year immediately preceding the first year of estimated emission reductions. In either case, the base year usually determines the earliest year of reportable emission reductions. DOE's revised guidelines are likely to specify the earliest year for which reports of emissions and/or emission reductions will be accepted. The current program uses forms that set 1987 as the earliest year for which reports would be accepted, seven years before the initial

program guidelines were issued. One question requiring resolution is whether the 1987 start year used by the current program forms should be updated when the new guidelines are issued. A second issue is whether the earliest base year for the calculation of creditable emission reductions should be some different, later year.

There are several options for the earliest base year, including:

- 2002, the base year used for the President's goal of reducing U.S. emissions intensity 18% by 2012.
- 2003 or 2004, since the new guidelines are not expected to be issued until late 2003.
- 1990, the base year used by the UNFCCC and the Kyoto Protocol.
- 1996/7, seven years prior to the issuance of the revised guidelines.
- 1987, the year specified by the existing reporting forms.

Of course, many individual firms or institutions, especially those that have yet to begin monitoring their greenhouse gas emissions, may be unable to report emissions or emission reductions from prior years and may wish to use base years of 2005 or later.

6. ACCOUNTING FOR SMALL DISTRIBUTED SOURCES AND SINKS

Voluntary Greenhouse Gas Reporting Workshops

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

BACKGROUND PAPER: ACCOUNTING FOR SMALL DISTRIBUTED SOURCES AND SINKS

I. Background on Small Distributed Sources and Sinks (SDS&S)

Small distributed sources and sinks may account for as much as half of U.S. emissions, and a large fraction of sequestration. The definition of “small” in this context need not be particularly precise, because the underlying notion of “small” is small as in “too small for it to be worth the owner’s trouble to participate in an emissions reporting program.” Some of the more important “small” sources and sinks:

- Some 80 million households own more than 120 million motor vehicles in the United States, accounting for more than 20 percent of U.S. greenhouse gas emissions (300 million metric tons of carbon). Vehicle emissions include both carbon dioxide from gasoline consumption and nitrous oxide from catalytic converters.
- Households also emit 111 million tons of carbon dioxide directly through fuel consumption, and 210 million tons of carbon dioxide indirectly, through electricity consumption. (Also about 20 percent of U.S. emissions).
- In addition, there are 4.7 million commercial buildings in the United States of varying sizes. Ownership of commercial buildings is very dispersed. While many commercial buildings are owned by large corporations, others are owned by specialty real estate firms. Most companies lease some of their needed space. The commercial sector accounts for 55 million tons of direct carbon dioxide emissions annually, and some 200 million tons of indirect carbon dioxide emissions through electricity consumption.
- There are several million farmers in the United States, working on about 2.2 million farms. Farms can consume energy (and hence cause emissions), sequester carbon in soils, stimulate emissions through use of nitrogen fertilizers, and cause or avoid methane emissions through their choice of livestock management practices. These multiple sources and emissions sinks, however, are individually quite small.
- In the transportation sector, there are hundreds of thousands of small vehicle fleets: many associated with small trucking or construction firms, and equipment rental companies.

SDS&S emissions can often be characterized by the following features:

- Large number of small sources/sinks; large number of potential owners of sources/sinks;
- Direct measurement of emissions may not be practical, on either cost or technical grounds;
- Emissions or sequestration may not be monitored or even known by the owner;
- Emissions may be heavily influenced by the performance of a bit of capital equipment (a car or light bulb) manufactured by someone else.

- The party best positioned to influence emissions may not be the direct emitter of the emissions;
- Assigning rights in emissions to a party other than the direct emitter may cause or permit “double counting,” or spawn conflicting claims; and
- Intensity measures may often be meaningless, since some owner (households, for instance) do not produce economic output.

Small distributed sources and sinks pose daunting challenges in any program aimed at limiting greenhouse gas emissions. Conceptually, however, there are several approaches.

II. Options

Note that these approaches do not have to be applied uniformly to all sources and sinks. The option chosen can be tailored to a particular source or sink.

A. Exclude Small Distributed Sources and Sinks

The simplest option is to decide that voluntary reporting and crediting is not a suitable policy instrument for reducing emissions for small distributed sources, and to prohibit reporting emissions from such sources. This approach greatly reduces the number of potential reporters (though not necessarily the number of actual reporters), and, if widely applied, would leave a large fraction of national emissions outside the program.

A secondary issue is whether emissions from small sources owned by large organizations should be reported if the smaller source is excluded. For example, if privately-owned light-duty vehicles are excluded from the program, does this also mean that vehicle fleets of reporting corporations ought to be excluded?

An exclusion rule could also be implemented as a “de minimus” or materiality rule. If the minimum level of emissions deemed to be reportable were set fairly high, most households and many small emitters would be excluded from reporting as a matter of course.

B. Treat Small Sources Equally with Other Sources

An alternative option is to make no special provision for small sources. Because the reporting program is voluntary, and the cost of monitoring, verification, and reporting are likely to be disproportionate to the number of tons reported, the number of actual reporters will be small, even if the number of potential reporters numbers in the tens of millions. This could simplify the problem of excluding sectors, as well as the practical problem of treating a particular source differently depending on the owner. The main disadvantage of this approach is that small sources will have insufficient motivation to take action under the program, and are unlikely to participate.

C. Define Small Sources Mitigation Actions as Projects

Yet another approach is to exclude (or not encourage) “entity” reporting by small sources and sinks, but to permit (or encourage) project reporting. This approach could, in principle, greatly simplify small source reporting. Whether project reporting is deemed to be an alternative to small entity reporting or in addition to small entity reporting is one of the issues that would need to be considered.

In the case of small projects, it may be desirable to establish a set of performance standards, or “assumed” emission performance for the desired activity, so that purchasing a (small) amount of emissions efficient capital equipment (such as a compact fluorescent light bulb or a hybrid car) is “deemed” to reduce electricity consumption or emissions by some set amount, and the computation of emissions reductions are simplified. In this case, the activity of the voluntary program becomes analogous to a straight subsidy of the desired activity. Small projects may be easier to report than small entity reporting, but they remain unlikely to be common unless there is some mechanism put in place to permit or require aggregation of such reports.

D. Permit/Require Aggregation of Small Sources

In aggregation, the emissions reports of many small sources are rolled up into a single aggregated report. The costs of reporting are distributed across many small emissions. Who might these aggregators be? This depends, in part, on whether the reports to be aggregated are small project reports or small entity reports, and, in part, on the type of emission or sink that is being considered. Aggregation of projects is generally more straightforward than aggregation of entities, though both are possible.

The DOE could, presumptively, promulgate guidelines that would prohibit, permit, or encourage aggregation, both in general, or for particular sources. Aggregation presents fewer (or, at least, not greater) double counting problems than other approaches to small distributed sources and sinks.

Another important consideration is whether aggregation is compulsory, by default, or voluntary/contractual.

- In compulsory aggregation, the DOE assigns the right to report to some party (for example, a capital equipment manufacturer on behalf of its customers) and elects not to receive reports from capital equipment operators.
- In default aggregation, the right-to-report is assumed to lie with the aggregator unless challenged by one of the aggregated, in which case the conflict must be resolved. (Conceptually, both could report, or the aggregated could report while the aggregator makes a deduction).
- In voluntary/contractual aggregation, the aggregator may report only with the consent of the aggregated. This consent must be expressed positively (through a contract or agreement).

Several different types of organizations might be willing or able to act as aggregators for small distributed sources.

- i) Service Providers. Service providers might be Energy Service Companies (ESCOs), or demand side management providers like public utilities or public benefits corporations, or government bodies in their capacity as providers of electricity or other services. In a service provider arrangement, the service provider would provide services tending to reduce emissions or increase sequestration in a set of small distributed sources or sinks. The service provider would report on behalf of the persons receiving these services, calculate the emission reduction effects of the services, and receive the transferable credit, either for onward transfer to the actual reducer, or (contractually) to be held by the aggregator as compensation for his efforts. Service provider arrangements are generally better suited to project reporting than entity reporting, though aggregating entity reporting is possible.
- ii) Capital Equipment Providers as Project Aggregators. In the case of capital equipment providers (for example, energy efficient vehicles or lightbulbs), the capital equipment provider would be deemed (by DOE) to have caused an emission reduction by the purchaser of the equipment, and this reduction would be deemed creditable as a project. Because the manufacturer will usually not know the actual usage and in-service performance of his equipment, this approach would probably require highly aggregated rules for “deemed” emission performance in order to be workable. At the project level, capital equipment provider aggregation is probably compulsory or by default.
- iii) Capital Equipment Providers as Responsible Reporting Entities. A logically distinct alternative to this approach is to assign responsibility for the emissions not just “deemed reductions” of capital goods to the manufacturer, rather than the operator. This approach creates an incentive for the manufacturer to reduce the emissions intensity of his (new) products, but it will produce large shifts in deemed emissions and reductions, with for instance, changes in the aggregate level of, say, vehicle miles traveled that are not under the control of the manufacturer. Capital equipment provider aggregation is probably compulsory.
- iv) Political Jurisdictions. Another approach is to assign responsibility for emissions to a political jurisdiction, making, for example, a municipal government responsible for the emissions of its households. This approach, in common with other assignment arrangements, suffers from a knowledge problem (will the government know about the emissions of its citizens?); an incentive problem (can the government effectively influence the emissions of its citizens?); and a double counting problem (what happens if some entities within the political jurisdiction which to report for their own account?) Political jurisdiction aggregation could be entity or project based. Political jurisdiction is probably compulsory or by default.
- v) Trade Associations. Another potential aggregator is a trade association. Trade association reporting for large industries has been considered, but has been rarely undertaken in the United States, in part because of competitive pressures or concerns

among firms. However, trade associations in which emissions are unrelated to competitive concerns may be useful in some cases. These may be trade associations of small firms, or trade associations with large firms and small sources (like emitters of high GWP gases). Depending on the source, aggregation could be entity or project-based. Trade association aggregation is most likely voluntary/contractual.

- vi) Unrelated Party Aggregators. Unrelated party aggregation assumes that small source reporting could be deemed profitable or socially desirable, and that entrepreneurs could report on behalf of unrelated groups of small emitters by spreading transaction costs over multiple small reporters. Unrelated party aggregation could be done either on a project or entity basis. However, unrelated party aggregation must depend, to be successful, on either an economic basis (i.e., credits are valuable, stimulating entrepreneurial activity) or on the basis of extensive political mobilization (achieving reductions has high social value, stimulating the non-profit sector to undertake this activity). Unrelated party aggregation is mostly like voluntary/contractual in nature.

7. PROJECT EMISSIONS AND REDUCTIONS

Voluntary Greenhouse Gas Reporting Workshops

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

BACKGROUND PAPER: PROJECT EMISSIONS AND REDUCTIONS

I. Background on Project Emissions and Reductions

In the current voluntary reporting program, reports of emissions and reductions are divided into two categories: entity reporting and project reporting.

Entity reporting is the reporting of a legal body, usually a corporation, but sometimes a Government agency, household, or facility. In general, entities report their actual emissions or sequestration. Actual entity emissions and changes in emissions over time are a measured *outcome*, which may have multiple causes or unknown causes. The most challenging questions in entity reporting are defining which emissions sources or sinks ought to be included.

Project reporting is generally reporting on the consequences of a specific action or set of actions, and the emissions, sequestration, and reductions *caused* by that action, results that are not necessarily limited to sources owned or operated by the project owner. Reductions caused by some action are generally defined as actual emissions compared with what emissions would have been in the absence of the project or action. Because the essence of project reporting is causation, it is commonplace for projects to have no actual emissions to report, only reductions or sequestration. A project can cause reductions, even though actual emissions are rising over time, or when there are no emissions at all.

The distinction between entity reporting and project reporting is often blurred in practice, because causation can enter into entity emission reporting (through indirect emissions) and into calculation of entity reductions (through hypothetical baselines). Similarly, actual emissions can enter into project reporting, because one way to define “what would have happened in the absence of the project” is by comparison with prior emissions, or by comparison of actual emissions with counterfactual emissions in the absence of the project.

Entity proponents view project reporting as inherently flawed, because the reporter can select a handful of emissions-reducing actions from a basket of emissions-increasing actions. On the other hand, project proponents often view entity reporting as reporting emission reductions that occur only by circumstance rather than through purposive action. They point out that entity reporting has its own set of problems with selection bias within and between entities. For this group, project reporting is preferred because of its necessary link with causation and purposive action. For some, entity reporting is seen as more “practical,” because emissions over time are measurable, while ascertaining causation is much more prone to require the exercise of opinion.

II) Interaction Between Entity Reporting and Project Reporting

Project reporting has important strengths and weaknesses vis-à-vis entity reporting. In a program that includes both types of reporting, it is important to devise ways of clarifying how project reporting might interact with entity reporting, and how a particular set of facts ought to be reported.

Firms may have corporate emissions, and emissions or emissions intensity may be rising or falling. At the same time, the corporation may be taking actions to reduce emissions. Entities that themselves have insignificant emissions may be in position to cause large reductions or to sequester large amounts of carbon dioxide. It is also common in the existing VGGRP for entities to have significant emissions, but only to report on reductions associated with one or more specific actions. In considering how projects and entity reporting might be related, there are several possible options.

- A. Include Entity Reporting Only.** This option appears to solve the problem of projects at a stroke, by prohibiting them. It would be based on the conceptual view that only entity reporting is legitimate, or alternatively, that the practical problems of project reporting (discussed below) are “too hard” to solve.
- B. Permit Project Reporting only Within Entity Reporting.** This same broad conceptual approach may be considered to apply in several different ways, depending on the view taken of the relative merits of entity reporting vis-à-vis project reporting, and also on the nature of the practical difficulties. For instance:
- Project reporters must report entity emissions to demonstrate the absence of leakage. This concept assumes that project reductions are creditable, but will only be credited if the entity undertaking the project can also demonstrate that its entity emissions or intensity are not increasing.
 - Entity reporters may (only) claim reductions if reductions are caused by specified actions. This is a particular form of hypothetical baselines, and is used by the Australian Greenhouse Office in their Voluntary Challenge Program.
- C. Reporters Must Select Entity Reporting or Project Reporting.** This approach assumes that entity reporting and project reporting are both valid, but that they are not additive. In this alternative, a reporter may choose to undertake entity reporting or project reporting, but not both. In principle, prevents double crediting of reduction actions. There are several less restrictive variants of this approach, which would permit entity and project reporting to coexist within the same reporter under certain specified circumstances: if and only if the project reductions are used to calculate entity reductions, or if and only if the project reductions deliver reductions that are outside the organizational boundary of the reporter (i.e., offsets).

- D. Project Reporting is Restricted to Selected Regions and/or Project Types.** This approach also assumes that both entity reporting and project reporting are valid, but in different spheres. For example, projects might be limited to forest carbon sequestration, or to energy efficiency projects, or to some other subset of all actions. This restriction might be based on a desire to provide incentives for reduction actions under circumstances where entity reporting would be impossible or irrelevant. This approach could be coupled to either of the two preceding approaches (i.e., choosing between projects and entities, or projects only within entities).
- E. Both Project Reporting and Entity Reporting are Permitted without Restriction.** This is the approach currently adopted by the VGGRP. This approach provides the maximum amount of information about the reporter's activities, but, if transferable credits are involved, permits the same action to be viewed both in terms of its effect on aggregate emissions and on its effects directly.
- F. Permit Project Reporting Only.** This is the approach adopted by the Clean Development Mechanism (CDM) under the Kyoto Protocol and also various offset programs under the Clean Air Act. It also resolves the conflict between project and entity reporting.

III. Practical Issues of Project Reporting

- A. Project Boundaries.** Determining project boundaries raises several types of issues: a project may cause reductions that are within the scope of another reporting entity (i.e., double counting); there is no obvious *a priori* rule for limiting the scope of projects; and a project reduction may "cause" offsetting increases either in non-reporting entities (external leakage), or within the entity not reporting entity-wide (internal leakage). In some cases, double counting and leakage issues can be observed and fixed directly; in others, generic "leakage factor" provisions can be defined and used. Alternatively, project activity can be limited to spheres where leakage and double counting are unlikely.
- B. Leakage.** Leakage is defined as a condition where the reported emissions reduction caused by the project is offset, in whole or in part, by an increase in emissions that occurs the project boundary. Leakage may be internal to the entity undertaking the project, or it may external, i.e., the offsetting increases may be undertaken by other actors (external leakage is not unique to projects and can occur within the context of entity reporting). Leakage can be limited in several ways: by requiring entities to demonstrate the absence of leakage; by estimating leakage directly; or by limiting project activity to spheres of activity where leakage is unlikely. Alternatively, one can decide that leakage is either: a) such a big problem that it makes projects undesirable; or b) such a small problem that

it can be safely ignored.

- C. Baselines.** Project reductions must be estimated by comparing actual emissions with what emissions *would have been* in the absence of the project, commonly referred to as a counterfactual baseline. There are several different approaches to constructing project baselines: the reporter decides; an independent verifier decides; the U.S. Government decides; an adjudication process decides; or the U.S. Government promulgates multi-project baselines.

8. INTERNATIONAL EMISSIONS REPORTING

Voluntary Greenhouse Gas Reporting Workshops

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

BACKGROUND PAPER: INTERNATIONAL EMISSIONS REPORTING

I. Background on Treatment of International (Foreign) Emissions

Treating emissions reported by U.S. companies that occur outside the United States raises a range of issues, some policy-related, some practical. Under the current Voluntary Greenhouse Gas Reporting Program (VGGRP), reporters have the option to report either domestic or overseas emissions, reductions, and sequestration, or both. However, reporters are required to distinguish between their domestic and overseas activities and to report them as separate categories, though the separate categories sum to a whole. In practice, relatively few firms report emissions from their operations overseas, but reporting of international projects (particularly carbon sequestration projects) is common. The revised program has an objective to design a system usable for transferable credits, and, in such a system, either including or excluding emissions from operations overseas introduces several issues, that have long been debated internationally.

II. Issues

A. “Leakage” in Entity Related Emissions

Some argue that both domestic and overseas emissions should be reported because corporate emissions cannot be gauged accurately if output and/or emissions can be shifted from domestic to foreign facilities or vice versa. Under this view, both domestic and overseas emission should be reported in the interest of “accuracy” and “completeness.”

B. “Double Counting” with Reductions Caused by non-U.S. Regulatory Programs

Some argue that some or all reporting on overseas emissions ought to be excluded because overseas emission reductions may be induced by policies introduced by foreign governments. For example, measures introduced pursuant to the Kyoto Protocol by Parties to that agreement, such as Clean Development Mechanism (CDM) projects. Under this view, providing transferable credits for emission reductions overseas achieved as the result of policies adopted by foreign government (and presumably creditable under other systems) might be viewed as double counting reductions required by others.

C. Opportunities for Low Cost Reductions in Developing Countries

If one of the purposes of the revised program is to limit the growth of atmospheric concentrations of greenhouse gases, then where reductions (including emissions avoided or sequestered) are achieved is immaterial to the environmental benefit obtained. Under this view, reductions should be acknowledged wherever they are achieved. Plus, allowing for the reporting and crediting of emissions overseas, particularly from projects, and particularly in developing countries, is desirable on at least two grounds. First,

reduction possibilities exist in developing countries that will produce a greater environmental benefit, at lower cost, than reduction possibilities in the United States. Second, allowing for the reporting and crediting of reductions overseas may provide the impetus for action in developing countries that would not exist otherwise.

E. Meeting Domestic Intensity Goals

If one of the purposes of the revised program is to help the United States achieve the President's objectives for reducing domestic emissions intensity, then foreign reduction or sequestration does not help achieve this objective.

F. Verification of International Emissions

Verification of foreign emissions poses a number of practical problems (*see Background Paper: Verification Issues*). The exact nature of these problems depends on the type of activity being verified, the baseline regime against which the reduction is measured, and the verification regime specified by the U.S. Government. However, the practical problems that may arise can be specified in general terms:

- International verification might prove more costly than domestic verification.
- Verifiers might lack specialized knowledge and experience related to international verification.
- Information necessary to construct baselines for verifying reductions may be absent or difficult to obtain.
- International verification might, in some instances, depend on a high degree of cooperation with foreign governments that might be difficult to achieve.
- If the U.S. Government decides to promulgate detailed guidelines for the calculation of emissions, sequestration, or emission reductions from particular sources or activities, such guidelines might become more complex if they must encompass situations or sequestration activities particular to foreign climates (i.e., sequestration in tropical rain forests).

III. Options

Decisions on the treatment of overseas emissions must balance the range of issues described above. The most desirable options will depend, in part, on the relative weight of the considerations. In all cases, reporters would be required (as they are today) to distinguish between their domestic and overseas emissions, reductions, and sequestration, and to report them as separate categories, though the separate categories sum to a whole.

Some of the possible options for international reporting include:

A. Do Not Include Reporting of Overseas Emissions and Reductions

Excluding overseas emissions and reductions would be based on a policy decision that achieving domestic emission reductions is the primary objective of the program, and/or

that overseas emissions are “too hard” to calculate and/or verify under the modalities of the revised program. This option could be rejected based on an appreciation of the importance and potential of overseas emissions, or perhaps based on concern about avoiding “leakage” of emissions overseas.

B. Include Foreign Reporting, but Provide Transferable Credits for Domestic Reductions Only

This approach would include reporting on emissions, reductions, and sequestration by reporters that have overseas activities, while crediting only reductions (including emissions avoided and sequestered) achieved in domestic activities. Foreign reporting might be subject to a “threshold leakage test,” i.e., overseas emissions or emissions intensity may not be rising while domestic emissions or intensity is falling. This option is a variant of the “Excluded Foreign Reporting” option, with an arbitrary international leakage test, and is consistent with the idea that leakage is the most important “international” issue.

C. Include Overseas Reductions (including Emissions Avoided or Sequestered) only if they Are Not Subject to a Foreign Regulatory Regime

Under this option, reductions (including emissions avoided or sequestered) would be included, unless they occurred as a result of foreign regulation. Such a restriction would be imposed to avoid double counting reductions achieved under foreign regulatory regimes (and presumably “creditable” under those regimes). A variant of this approach might be to include reporting on overseas reductions in selected countries, while excluding reporting on reductions in other countries (for example, reporting on reductions achieved in Parties to the Kyoto Protocol with targets might excluded, while reporting on reductions achieved in other countries might be included).

D. Include Reporting on Reductions Achieved in Overseas Operations but not Overseas Projects

This option presumes that concern about international leakage is particularly important, but that verification or measurement issues with foreign projects are deemed “too difficult;” the difficulty outweighing the benefits of foreign offsets.

E. Allow (But Do Not Require) Reporting of Overseas Emissions

This option lets the reporter decide whether overseas emissions are relevant to the reporter’s situation or not. This is the option used by the current VGGRP. Reporters are required to distinguish between their domestic and overseas emissions, and to report them separately. In a revised program, the U.S. Government would develop whatever verification or reporting procedures are necessary.

F. Require Reporting of All Foreign Emissions

Under this option, avoiding “leakage” is the paramount consideration, so that if a reporter has overseas emissions, they must be reported. There are some variants of this proposal, such as overseas emissions subject to a materiality or “de minimus” test. (i.e., a reporter must report all material foreign emissions).

G. Include or Exclude Reporting of Overseas Emissions based on Industries that Are “Leakage Susceptible”

Some industries may be more susceptible to “leakage” (i.e., to shifting emissions from domestic to overseas operations) than others. Reporting could be included from industries determined to be susceptible and excluded from industries determine not to be susceptible.

9. EMISSIONS DATABASES AND REGISTRIES - THE INTERNATIONAL CONTEXT

Voluntary Greenhouse Gas Reporting Workshops

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

BACKGROUND PAPER: EMISSIONS DATABASES AND REGISTRIES –THE INTERNATIONAL CONTEXT

I. Introduction to International Databases and Registries

There are a wide variety of databases and registries in existence or under development for recording and tracking emissions, emission reductions, projects, voluntary actions, or permits to emit. They differ because their objectives differ from recordation of voluntary reductions to supporting an allowance-trading regime. Even among those associated with voluntary programs, there are differences in terms of data included, monitoring and verification requirements, and government commitment to honor reductions against some future more binding domestic and international commitment. Finally, some voluntary registries provide for trading of authenticated reductions.

Over the last decade several varying regimes have been and are being established to record emissions, emissions reductions, or allowances to emit greenhouse gases (GHG). They have been developed and operated by governments, in partnerships between governments and the private sector, or purely by private entities. They vary in terms of what they record, their purpose, and their modalities. The term “registry” has been applied to many of these regimes from the simplest database to the more elaborate regimes that take on the character of a bank where entities hold accounts of marketable assets.

II. Project Databases:

Several of the recordation regimes originate in the desire of countries to participate in the Activities Implemented Jointly Pilot Phase authorized by the UN Framework Convention on Climate Change (UNFCCC) and created by COP 1 in Berlin. Article 4.2(a) of the UNFCCC provides that Parties may implement obligations jointly. Article 4.2(d) directs the Parties to develop criteria for joint implementation at its initial Conference of the Parties. Decision 5/CP.1 created the Activities Implemented Jointly Pilot Phase for reduction projects supported by Annex II Parties in the non-Annex II Parties.

Several Parties, including the U.S., created programs to facilitate or in some cases to develop AIJ projects. In the U.S. the program is called the U.S. Initiative on Joint Implementation (USIJI). These programs maintain a database of projects. Projects that meet certain criteria, in particular host and sponsoring country acceptance are recorded in a UNFCCC Secretariat database of projects. Projected emission reductions associated with AIJ projects are recorded in the UNFCCC database. Realized emission reductions are not determined or recorded. Monitoring and verification of projects is not done for the UNFCCC AIJ project database, although as noted before, both countries must acknowledge acceptance of the project at an appropriate bureaucratic level within each national government. Any monitoring and verification requirements originate in national programs. Because AIJ projects are not creditable under Decision 5/CP.1, the

reductions achieved are not transferable, nor do the databases include accounts for generators of reductions as a more fully elaborated registry might.

IV. Emission Reduction Databases

Some recordation regimes were developed to support efforts by governments to encourage voluntary emissions reduction activities by industry. Typically, such regimes register reductions reported, but have fairly limited verification requirements. While participants record emission reductions annually they do not have accounts in the database that can be used to accumulate reductions and to trade among participants. The current U.S. 1605b program is such a regime.

Australia’s Greenhouse Challenge Program: The Australian Greenhouse Office operates on behalf of the Australian Government, a Greenhouse Challenge Program. The Program combines voluntary agreements with reporting. Reporting can occur at both the entity and project level and includes possible verification. The reporting is designed to report on progress towards the goals of the voluntary agreements. Entity wide emission reduction reporting is however tied to identification of specific actions. No formal endorsement of reported reductions for early credit, emissions trading, or baseline protection is made for the program.

E7 Greenhouse Gas Management Strategy: One example of a private sector emission reductions database is the E7 Network of Expertise for the Global Environment a greenhouse gas management strategy that was developed in 1996 and includes a registry. The nine members of E7 represent some of the largest electric utilities in the G-7 countries. The Strategy sets two goals:

- Participate in the international dialogue about greenhouse gas emissions management, global warming and sustainable energy development;
- Contribute to global greenhouse gas emissions reduction greenhouse gas emissions.

The registry is to record actions to reduce greenhouse gas emissions and the reductions achieved with E7 projects.

V. Voluntary Registries

Some emission reduction databases are designed to track emissions inventories or support emissions trading. Trading is voluntary in these cases however, and that has inevitable effects on the transactions costs that can be imposed on participants in order to insure accuracy in reports and veracity in tons reported.

The Canadian Greenhouse Gas Reduction Registry: The Canadian registry is part of Canada’s Voluntary Challenge and Registry Program and was “created to accommodate the need for project-based registration.” It provides this service to several Canadian voluntary programs including their:

- Baseline Protection Initiative;
- The Greenhouse Gas Emission Reduction Trading (GERT) pilot;

- Activities Implemented Jointly projects; and
- The Technology Early Action Measures (TEAM).

The program has evolved from a government program to a private-public partnership. VCR, Inc. reports to a *Council of Champions* comprising senior representatives from leading industry organizations and government bodies. Participants earn fill out a checklist, which assigns points to certain types of actions including more indirect actions like education programs. Registrants are encouraged to “tabulate their projected GHG emissions (or emissions intensity) for each business unit, facility or energy source. Typically, registrants list three to six major sources of emissions.” To reach various award levels participants earn the points. If baseline protection is claimed should Canada institute a mandatory reductions scheme like cap and trade, then in order for protection to be claimed, the reductions must be independently verified. Baseline protection also requires that “result in real reductions, i.e., reduction in emissions intensity that is directly attributed to a specific and identifiable action, net of any emissions increases that occurred elsewhere.” Rules for the credit registry are under development.

Canada’s original Voluntary Challenge and Registry Program also had this character, although it has evolved into a much broader registry system. Canada identifies the purposes of their program, many of which are typical of such registries.

- To recruit broad participation from all sectors of the Canadian economy with the support of the Council of Champions and in conjunction with sector organizations.
- To record and document participation, action plans, best practices and achievements.
- To analyze actions and achievements, and consider their potential for further progress and to provide the related support to participants as their involvement deepens.
- To recognize, publicize and promote participants making significant progress towards Canada’s reduction objectives with the support of the Technical Advisory Committee.’
- To contribute to the development and implementation of standards and procedures for measuring the impact of reduction activities.
- To provide a national registry for initiatives which lead to early voluntary action to reduce GHG emissions,
- To prepare progress and annual reports, and identify issues for consideration in the evolution of VCR Inc.

The Canadian program is the broadest and most elaborate voluntary registry program in the world. Permitting recordation of both project-based and entity-based activity, different levels of recognition, a broad-based of programs for participation, and the possibility of conversion of the real, most rigorously determined reductions into credit against a more mandatory regime should Canada accept such an obligation.

The Environmental Resources Trust’s Greenhouse Gas Registry: This registry is an example of a private registry designed to encourage an interest in emissions trading. Emissions reductions are registered in this system. The GHG Registry provides:

- Transparent recordation and tracking of qualified emissions reductions;
- Credible third-party review, and quality assurance, of reductions recorded in the GHG Registry;
- Establishment of a long-term pedigree of the reductions claimed for early action and other public programs; and
- A credible mechanism for the retirement of GHG emissions reductions

“The GHG RegistrySM features the following: serialization of each metric ton of CO₂ equivalent reduced; double-entry accounting framework; a secure Oracle database; a capacity to add tools and links to other sites; and stand-alone software use.”

VI. Kyoto Based Registries

The UNFCCC COP has been preparing the rules for the Kyoto Mechanism since COP3 in Kyoto. In large measure the rules were completed at COP7 in Marrakech. Among the registry related issues decided at Marrakech was a determination that there would be national registries in Annex I Parties. Those registries are “to ensure the accurate accounting of the issuance, holding, transfer, acquisition, cancellation and retirement” of Kyoto mechanisms units. The UNFCCC Secretariat shall “establish and maintain an independent transaction log to verify the validity of transactions.” Each registry “shall be in the form of a standardized electronic database” containing common units.

An ad hoc, intercessional group established by SBSTA is developing much of the harmonized technical standards for national registries. Among some of the items under consideration are the serialization of Kyoto units, account numbers, and transaction numbers. “Following ISO practices, elements of these numbers may be coded as a specific number of alpha or numeric characters.” Standards governing communication between national registries, security, and verification procedures will also be developed.

Annex I countries are in the process of developing national registries. The UNFCCC Secretariat conducted a survey of Annex I Parties to assess progress and registry plans. Twenty-four countries responded and those results are summarized in Table 1 below. Non-Annex I countries will have one international registry where any Certified Emission Reductions (CERs) they have can be deposited.

The UK Emissions Trading Registry: The UK has initiated a pre-Kyoto emissions trading regime. While it is voluntary, agreement to participate does convert the agreed emissions cap into a contractual obligation. An emissions trading registry has been developed to record the allocation, holding, transfer, cancellation and retirement of allowances. In order to participate in emissions trading, a person or entity must hold an account on the registry. The Secretary of State for Environment, Food and Rural Affairs; will assign a unique account name and identifying number to each account opened in the Registry. There are the following types of account—

- Compliance accounts – participants keep allowances for compliance in this account.
- Trading accounts – this account is used for trading excess allowances earned from previous periods where emissions were less than the entities target.

- National cancellation account – where cancelled allowances are kept, and
- National retirement account – where allowances retired under certain provisions of the trading system are kept.

Table 1 from UFCCC/TP/2002/3: Results of the questionnaire on national registry development

Annex I Party	Finish registry design	Finish registry construction	Considering a single registry if domestic trading introduced	Considering registry cooperation/consolidation with other Parties	Government operation of the national registry
Austria	2003	2004	Yes	Yes	Maybe
Belgium		2004		Yes	Likely
Bulgaria	2004	2005	Yes	Yes	Yes
Canada				Unlikely	
Croatia					Yes
Czech Republic	2004	2005	Yes	Yes	Likely
Estonia					Yes
EC	2003	2004	Yes	Yes	Yes
France	2002	2003	Yes	Maybe	Maybe
Germany	2003/04	2003/04	Yes	Yes	Yes
Japan	Post COP8	Post COP8		No	
Latvia	2003			Yes	Yes
Monaco		2003 ¹		Yes	Yes
Netherlands	2002 ²	2002 ²			
New Zealand	2003/04	2005	Yes	No plans	Yes
Norway	2003/04	2003/04	Yes	Maybe	Maybe
Poland	2003	2004 ¹	Yes	Yes	Yes
Russian Fed.	2005	2007	Yes		Yes
Slovakia	2003	2004	Yes	Yes	Yes
Slovenia	2002	2003		Yes	Likely
Spain		2004	Yes	Yes	Yes
Sweden		2004	Likely	Yes	Yes
Switzerland	2003	2004	Likely		Yes
UK	2001	2002	Likely	No plans	Likely

¹ This date is dependent on the Party's use of the mechanisms.

² These dates refer to an interim system.

10. CONFIDENTIALITY OF REPORTED DATA

Voluntary Greenhouse Gas Reporting Workshops

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

BACKGROUND PAPER: CONFIDENTIALITY OF REPORTED DATA

I. Background to Confidentiality Issues

To address the multiple goals of the Voluntary Greenhouse Gas Reporting Program (VGGRP), the current reporting program guidelines, instructions, and program staff discourage reporting data the reporter believes is entitled to confidential treatment. In eight years of reporting, less than one percent of all reports have included any claim of confidentiality. Because no requests for release of that information to the public have been made, DOE has not determined whether these data would be entitled to protection. For those reports with confidentiality claims, the program releases only partial information, showing that a report was filed and the Standard Industrial Code (SIC) of the reporter, and omitting all identifying information on projects, as well as all information on emissions and reductions, reported in these filings. Many possible improvements to the reporting program, particularly those addressing measurement accuracy, reliability and verifiability, are unlikely to be materially affected by whether reported data is exempt from public disclosure. However, it is possible that other improvements under consideration, such as encouraging data to be reported on the basis of GHG intensity and the recognition of emissions reductions for purposes of transferable credits, could be impacted by decisions to disclose or protect reported data. For example, data on energy use by a company would provide not only an estimate of GHG emissions, but also offer competitors insight into a substantial input into the reporter's product. Particularly with standardized accounting methods as recommended in the 4-agency July 8th letter to the President, competitors may be able to use the accounting methods and emissions data reported to "back calculate" a reporter's energy use and costs as well as the production quantity. GHG intensity reporting would make these determinations even easier. Although large and diverse reporters may be able to use data aggregation to minimize the need to protect reported data as confidential, the reports of small and single-product entities, as well as project reports, may provide data with sufficient specificity to reveal information important to competitors.

III. Relevant Law

In general, information submitted to the Federal government must be made available to the public, unless the information falls within a specific exemption from disclosure in the Freedom of Information Act. Section 1605(b)(3) provides that "[t]rade secret and commercial or financial information that is privileged or confidential shall be protected as provided in section 552(b)(4) of Title 5 [of the United States Code]." This refers to Exemption 4 under the Freedom of Information Act, which exempts from disclosure "trade secrets and commercial or financial information obtained from a person and privileged or confidential." While a reporter may believe that data voluntarily submitted is entitled to protection, that protection is not automatic. Commercial information must be privileged or confidential in order to be protected under Exemption 4. Under the Department of Energy's Freedom of Information Act regulations (10 CFR 1004.11), when the public requests such data, the Department must evaluate each claim of confidentiality and determine whether to disclose the data.

In contrast to the protection provided under section 1605(b)(3) for data provided to the VGGRP, some Federal environmental statutes do not provide similar protection to some data required to be reported. Section 114(c) of the Clean Air Act, for example, explicitly exempts emission data from protection as trade secret information. Moreover, the Environmental Protection Agency (EPA) has long defined “emissions data” to include operational and engineering information necessary to support reported emissions data (*see* 40 CFR § 2.301(a)(2)). Data submitted to the Department of Energy, including emissions data, are not covered by similar provisions. Where identical data is submitted to both agencies (*e.g.*, CO₂ emissions reported by electric steam generators to EPA under 40 CFR Part 75 and to the current 1605(b) program), its public availability through EPA renders any confidentiality claim moot.

Possible Options

- A. Segregate (or tier) data based on claims of confidentiality, and continue to protect information submitted under a claim without commencing the review/determination process.** Only when data are requested to be disclosed is a determination made. Under this option, data "marked" with a claim of confidentiality by the reporting entity would not be made available to the public unless requested and determined not to be entitled to protection. DOE does not initiate determinations of protection. This would not preclude the reporting entity from authorizing DOE to release the information claimed to be confidential to any party (*e.g.*, a party to whom the entity has contractually agreed to transfer reduction credits).

Advantages:

- Similar to existing reporting process.
- Allows easy identification and subsequent evaluation of public data for possible crediting and/or future climate policy protection.
- Minimizes agency administrative burden in reviewing data for which the protection is not claimed.
- Could be used in concert with other possible tiering systems suggested for improving measurement and estimation techniques or other factors.

Disadvantages:

- Could affect the fungibility of credits in any subsequent trading system.
- When data requested, agency resources to review claims and/or contracts are necessary.
- “Clouds” part of the program’s data, by tagging it with the claim and secrecy.

- B. Review all data to which a claim of confidentiality is attached at the time the data is submitted and make a determination to release or protect the information.** All data in the database is publicly available. Data entitled to protection is not entered to the program, possibly making the reductions ineligible for program benefits.

Advantages:

- Consistent with, though not identical to, existing program.
- Provides complete data transparency, which may be important in any subsequent credit trading or other program.

Disadvantages:

- Major resource burden for the government.
- Removes some reported reductions from participation in any subsequent program benefit, *e.g.*, use in a trading program.

C. Accept only data for which the reporter does not claim, or expressly waives, protection from public disclosure. All data submitted is publicly available. The confidentiality provision in section 1605(b) can be viewed as implying that DOE must accept voluntary reports of information on greenhouse gas emissions, carbon fixation and reductions which contain trade secret or confidential business information. On the other hand, the provision may be interpreted as requiring only that DOE protect confidential business information that it allows reporters to submit. Under the latter interpretation, the revised guidelines could require, as the “cost of admission” to the reporting program (or to certain benefits of the reporting program), that certain reported data be available to the public, regardless of whether the reporter believes it would be entitled to exemption from public disclosure.

Advantages:

- Simple.
- Provides complete data transparency, which may be important in any subsequent trading or other program.
- Eliminates agency administrative burden in reviewing data to determine whether it is entitled to exemption from public disclosure.
- Consistent with, but not identical to, current practice.

Disadvantages:

- Possible severe barrier to wide participation in the program, especially for reporters by GHG intensity and/or project, and by small and single-product entities.
- May have implications on the confidentiality of similar or identical data submitted to other programs/agencies.
- Classes of reporters where most data is already required to be made public (*e.g.*, regulated utilities) could be advantaged (*i.e.*, no confidentiality concerns limit reporting) over differently situated competitors (*e.g.*, merchant power).

D. Where independent verification/certification is provided (see Background Paper: Verification Issues), include all data, including that claimed to be confidential, to be submitted to the independent verification/certification body. The verification or certification body certifies that any data submitted to the VGGRP data base is consistent with the complete data reviewed, and the verifier and reporter submit only data not claimed as confidential (*e.g.*, aggregate data).

Advantages:

- Protects confidential data.
- Consistent with some other protocols (*e.g.*, WRI, California GHG Registry).

Disadvantages:

- Resource burden falls on the reporter, not on the government.
- Puts more burdens on the design and operation of the verification/certification process and requirements for verification/certification bodies.
- “Clouds” part of the program’s data, by tagging it with the claim and secrecy.

11. VERIFICATION ISSUES

Voluntary Greenhouse Gas Reporting Workshops

VOLUNTARY GREENHOUSE GAS REPORTING WORKSHOPS

BACKGROUND PAPER: VERIFICATION ISSUES

I. Background Paper: Verification Issues

The July 8, 2002 4-agency letter to the President recommended that the U.S. Voluntary Reporting Greenhouse Reporting Program (VGGRP) should support “independent verification.” Implementing this recommendation would move beyond current guidelines which rely on “self-certification” as required by statute in Section 1605(b) of the Energy Policy Act of 1992.

“Verification” encompasses a wide range of concepts. Strictly speaking, verification is a determination/assessment of factual truth. The goal of verification is much like that of auditing, which seeks to discourage and detect misrepresentation and innocent error, establish credibility, and increase efficiency in the marketplace. However, in practice it is used to refer to a much richer range of ideas including verification type; verification process; verification rigor; verification frequency; and verification responsibility. Verification can be information-intensive, costly, and raise confidentiality issues (see *Background Paper: Confidentiality Issues*). Therefore, verification requirements need to be balanced against the willingness to participate, the value of the credits being offered, and the program’s need to be credible.

II. Verification Type

Verification Type refers to the purpose behind conducting verification. The motivation for conducting verification may range from assessing reporter’s interpretations of GHG accounting rules to their processes of measuring and calculating to the actual quantities reported. Verifications types include:

A. Verification of Interpretation examines the choices a reporter makes in determining what tons or information to count and which ones to omit. For example, the verifier may review a reporter’s justifications for drawing boundaries around a project. Or, they may examine justification for choosing the denominator in an intensity calculation.

Advantages:

- In a flexible system, this approach to verification gives the verifier/auditor wide latitude to determine the intent of the reporter, thus encouraging reporters to err on the side of caution. This ideally reduces the attractiveness of creative reporting.

Disadvantages:

- There is a potential for inconsistency among auditors and how different entities and industries are treated;
- Results of such verification may be unpredictable due to the inherent subjectivity;
- May discourage participation because of risks of variability.

B. Verification of Process assesses the types of actions and units of measures reported. This involves showing that the emissions and/or reductions were calculated using good procedures (This is typical standards established by the International Organization for Standardization.). For example: The review would look for evidence the reporter used particular equipment to make emission measurements, and that all the “right” parts of an emitter’s operations were measured and factored into the data provided. One suggestion for a well-developed emissions report is that it includes a clear discussion of boundaries, methodological approach, data integrity, and data management procedures. Moreover, recently released data quality guidelines, seek to “ensure and maximize the quality, utility, objectivity, and integrity of the information DOE disseminates to members of the public.”¹ Without such guidelines a new set of measurements and calculation would have to be made every time one wanted to assess the credibility of a report. Verification of Process is a review of procedure, not a measurement check of quantities; and is one of the more commonly used approaches to verification.

Advantages:

- Less costly than quantity verification in terms of auditing as only the process is subject to review;
- Can be viewed as a base for subsequent quantity verification.

Disadvantages:

- There is little if any review of actual emissions.

C. Quantity Verification or (Verification of Facts) assesses the accuracy of reported emissions (sequestration) or emissions reductions of each type of action. This may include a review of baselines, and a review of all data needed to compute emissions or emissions reductions. Quantity Verification could include onsite measurements for comparison to those reported.

Advantages:

- As long as there are objective measurement criteria, this is a straightforward process;
- Many emissions and emissions reductions, such as energy-related carbon dioxide emissions can generally be measured with good accuracy through mass balance (i.e., by measuring fuel burn).

Disadvantages:

- Establishment of the measurement criteria can be difficult;
- May be costly and intrusive to measure and audit all sources of emissions (although new automated monitoring equipment may be able to reduce costs);
- Emissions of other gases and carbon sequestration are often more complicated to measure particularly from area sources (land fills, surface coal mines, rice paddies, etc.). This problem is exacerbated because many sources are relatively

¹ Dept. of Energy Final Report Implementing OMB Information Dissemination Quality Guidelines, 67 Federal Register 62446; Oct. 7, 2002.

small, so the cost of accurate measurement may be disproportionate to the level of emissions/reductions. One suggestion for solution is to use a “de-minimus” rule: emissions smaller than some level may be ignored. In any case, even if the theoretical cost of measurement is low, potential reporters may not have systems in place to make such measurements. This issue is particularly sensitive because a typical verification test is “completeness.” Reports may be substantively “complete” but lack estimates (or accurate estimates) for tiny sources such as methane emissions from fuel combustion.

III. Verification Rigor (also referred to as “Intensity” or “Level”)

Once the purpose(s) for verifying reports is agreed upon, the level of detail of review must be chosen, which can range from self-certification to independent review. There are significant differences in opinion about the amounts/levels of “verification” needed, and the tradeoffs between cost and effect. Levels include:

A. **Self-certification** (meaning no external review of reports).

B. **Independent verification.** Typically performed by parties independent of the organization whose emissions/reductions are being verified. An external group examines the reporter’s records and/or equipment and certifies their consistency with established, objective standards. Options include:

- Desk review for plausibility and arithmetic error (this is done now by EIA);
- Desk-based comparison with third party data;
- On-site review of books and measurement or cross-checking with other parties; or
- On-site review comparable to financial audit.

Complexity and cost rise accordingly. Verification must cost less than the inferred value of the credits for participation to be worthwhile. This may be a significant issue for small firms and/or small projects. The challenge in designing a review system is to balance the benefits and costs of verification.

IV. Verification Cross-Section / Frequency

Additional flexibility and cost savings may be achieved by adjusting how often a review is conducted, i.e. the cross-section that is verified during a given time period. Options include:

A. **No verification.** Currently the U.S. relies on self-certification. The Canadian program requires verification in principle but in practice it is deferred until or unless cap & trade is established.

B. **Random verification.** It is conducted on a sample of the reporters; similar to IRS audits. For example, the Australian program requires verification in principle, but actually only conducts verification randomly.

- C. **Non-yearly (mixed) verification.** A full review may be conducted every five years, with desk review other years.
- D. **Threshold verification.** A full review is only triggered when emissions/reductions change by a certain percentage.
- E. **Complete/compulsory verification.** All tons reported are reviewed. The United Kingdom program does this.
- F. **Challenge verification.** Verification is only conducted when someone challenges the validity of the report.

V. Verification Responsibility

There are a variety of ways to organize who chooses the verifiers (the reporter or the government), how verifiers are certified and who pays for the verification. Options include:

- A. Reporters chose any firm they like.
- B. Government defines attributes of “acceptable verification,” reporters choose any firm they like, government reviews verification report.
- C. Government certifies independent verifiers; provides list of “approved verifiers;”
- D. Government conducts the verification (say, GAO). This option assigns the cost of verification to the government, unless it accesses a user fee on reporters when they file their reports. The reporters will bear the verification costs and the government will likely bear the costs of managing the program under the other choices.

What constitutes “certification of a verifier” is a topic in itself. The California Climate Action Registry’s Certification Protocol requires that potential verifiers “will need to demonstrate experience in certification and verification of financial data, technical data, quality control, and/or environmental management systems. [Verifiers] must also demonstrate the means to accept financial liability for certification activities undertaken for a Registry participant.”² And finally, they must attend training provided by the registry.

Options for certifying the verifiers in the VRP include: A federal agency or review board; a nonprofit review board; or a consortium of government, nonprofit and private interests. A list of possible verifiers include:

1. U.S. government
2. Financial Auditor
3. Environmental Auditor
4. Process Auditor
5. NGO Auditor
6. Professional Engineer, PE

² California Climate Action Registry’s Certification Protocol, October 2002, page 2-1.