ENVIRONMENTAL RESOURCES TRUST
A nonprofit with a mission to pioneer markets to improve the environment.

VERIFICATION SYSTEM DESIGN FOR RGGR AND RGGI

WHITE PAPER

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Executive Summary

The Northeast States and several Mid-Atlantic States are currently developing a Regional Greenhouse Gas Registry (RGGR), a policy and accounting framework capable of quantifying and registering greenhouse gas emissions and project-related emission reductions or "offsets." This registry framework will be used to support the following program types: (1) a regional voluntary reporting program developed by a group of northeast states, (2) mandatory reporting programs developed by individual States, (3) a mandatory regional cap-and-trade program called the Regional Greenhouse Gas Initiative (RGGI), and (4) a project offset program under RGGI.

The process of assuring the quality of data reported to an emissions registry is generally referred to as 'verification'.[1] The objective of a verification process is to enable the verifier to issue a verification statement and verification opinion on whether the assertions regarding emissions and other information made by a reporter are free from material misstatements. The goal of the verification system recommended and outlined in this white paper is to provide a high level of data quality assurance to all mandatory, voluntary, and RGGI programs—that will be useful to current and future regulatory efforts—while minimizing both public and private costs.

RGGR and the verification system design in this white paper are unique in that they present the first example of integrating so many different program types together. As a result, there are opportunities and challenges with developing a comprehensive verification system. Both are addressed, in part, through a recommendation for a centralized verification system for all program types that, in addition to assuring data quality and improving efficiency, will better ensure that consistent and harmonized data is entered and maintained in the registry.

This paper provides general recommendations—relevant for all program types—on the following verification system design issues.

[1] Other professional fields also refer to this process as "auditing." The term "certification" is used to describe this process under the California Climate Action Registry (CCAR); however, certification more universally refers to the final administrative approval of a submission.

- Reporting and verification system design
  - Reporting and verification system focus
  - Verification system design
  - Accreditation process
  - Funding scheme
  - Liability and legal sanctions
- Verification process
  - Verification rigor (risk-based)
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  - Conflict of Interest (COI)
  - Material discrepancy and *de minimus* tests
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- Data handling and documentation
  - Verification statements
  - Confidentiality and non-disclosure agreements
  - Record keeping and retention

In addition to general recommendations on these issues, initial program-specific recommendations are also provided. These program-specific recommendations address the expectation that the rigor of the verification approach used for each type of State or regional greenhouse gas program will likely vary.

Our strongest recommendation is that the reporting and verification system for all program types should be focused on facility-level data versus corporate-level data. This focus does not preclude the aggregation of facility-level data into corporate totals, but it does avoid a number of complications with the verification of corporate-level reporting (e.g., verifying and tracking organizational boundaries over time) that are likely to increase the costs of verification, present problems for the design of registry software, lower the level of data quality assurance achieved, and result in data that is less useful for current and future regulatory efforts.

The model for verification followed by many existing voluntary reporting programs which operate at the corporate-level has proven to be expensive and has provided a low level of assurance as to the accuracy and transparency of emission reports. The approach recommended in this paper is based on a compliance risk model where verification activities (i.e., audits) are based on facility-level data and a measure of the risk that a material discrepancy (i.e., a combination of likelihood and magnitude) is above a particular risk threshold for the each program. In summary, we recommend that the verification system for all program types be based on the following process:

(1) A centralized accreditation board creates and maintains a pool of accredited 3rd party verifiers for all programs to draw upon
(2) A risk-based rating that determines the rigor of verification activities assigned to each facility report submitted to a program
(3) A verifier is assigned from the pool to each facility[2]
(4) A COI evaluation committee determines if the selected verifier is appropriate

[2] Alternative formulations of verifier assignment are also discussed which allows corporations to select their own verifier.

(5) A verification/certification body reviews the final emissions inventory report and verification statement
(6) The verification/certification body then certifies and registers the facility-level inventory report

The risk-based rating takes into account the goals of the relevant greenhouse gas program, size of facility (in terms of emissions or some reasonable proxy for the likely quantity of emissions), past verification findings, potential problems identified in an initial automated screen, and the judgment of the verification/certification body. Each facility report would be labeled as high, medium, low, or zero risk. According to its label, a facility report would undergo one of the following verification processes:

- Zero risk: No verification necessary beyond initial automated submission check
- Low risk: Regulator (i.e., verification/certification body) conducts basic desk review
- Medium risk: A thorough desk review by a 3rd party verifier
- High risk: A thorough 3rd party verification process including field audits followed by a review by regulator (i.e., verification/certification body)

The cost savings of the verification system design recommended here derive, in large part, from the application of this risk-based approach in combination with facility-level reporting. It allows program administrators to control verification costs without significant sacrifices in terms of data quality.[3] In this paper, we assume that the resources devoted to verification will likely be greater for a mandatory scheme than a voluntary scheme, and greater for a regulatory scheme that mandates real greenhouse gas emission reductions (e.g., a cap-and-trade scheme) than for a mandatory reporting scheme with no mitigation requirements. However, the planned applications of the data reported under each program supported by RGGR will determine the effort and resources necessary for verification and review.[4]

We also outline and recommend a fee-based funding scheme for the verification system that can be tailored by program administrators to balance the allocation of costs between public and private parties.

The penalties for noncompliance with a program and the potential liability faced by a reporter or verifier can be a powerful incentive for accurate reporting and review. Decisions addressing liability and legal sanction issues for the verification system are likely to be some of the most critical ones made by policy makers, as they will in large part determine the quality of registry data, the cost of reporting and verification, and the level of participation in each program. We provide general recommendations for the type of liability that should be required of verifiers for each program type.

The recommendations in this white paper are based on a preliminary review of existing voluntary and mandatory greenhouse gas reporting and emission trading programs and the practical

[3] Assuming that there are sanctions and enforcement of some type for misleading or false reporting by reporters and/or verifiers.

[4] For example, if a State intends for the data reported under a voluntary program to be used, in the future, for regulatory recognition under credit-for-early-action or other scheme, then verification resources should be devoted to the voluntary program in keeping with the future data quality requirements of the data.

experience of Environmental Resources Trust.[5] Additional work to fully elaborate a centralized verification system for all program types supported by RGGR is necessary. Therefore, we provide a summary of next steps for the implementation of the verification system described in this paper.

[5] Funding for this work was insufficient to complete a thorough evaluation of the experience of existing reporting and emissions trading programs.

1 Introduction

The Northeast States and several Mid-Atlantic States are currently developing a Regional Greenhouse Gas Registry (RGGR), a policy and accounting framework capable of quantifying and registering greenhouse gas emissions and project-related emission reductions or "offsets." This registry framework will be used to support mandatory and voluntary greenhouse gas reporting programs and the Regional Greenhouse Gas Initiative (RGGI), a mandatory cap-and-trade program. The registry system operated under RGGR is expected to support both (1) the registration of greenhouse gas emissions data for a variety of State and regional programs and (2) the tracking of emission allowances for RGGI cap-and-trade and project offset schemes.

To be effective, emissions reporting and trading registries must house transparent and credible data. The transparency of data in a registry relate to the detail and clarity of information, as well as the breadth of access provided to the public. Keeping all other factors constant, more transparent data tends to be more credible; however, the credibility of data in a registry is also a function of the resources devoted to review and verification. The process of assuring the quality of data reported to an emissions registry is generally referred to as 'verification'.[6] In this paper, we assume that the resources devoted to verification will likely be greater for a mandatory scheme than a voluntary scheme, and greater for a regulatory scheme that mandates real greenhouse gas emission reductions (e.g., a cap-and-trade scheme) than for a mandatory reporting scheme with no mitigation requirements. However, the planned applications of the data reported under each program supported by RGGR will determine the effort and resources necessary for verification and review.[7]

The objective of the verification process is to enable the verifier to issue a verification statement and verification opinion on whether the assertions regarding emissions and other information made by a reporter are free from material misstatements. In order to do so, the verification process focuses on understanding the relevant emission sources (or removal sinks), the information and quality of management systems, monitoring procedures, data collection and quality, and estimation methodologies. Functionally, the verifier becomes an independent third party between a reporter and a regulator (i.e., program administrator). The verifier's task is to ensure the honesty and accuracy of communication from the reporter to the regulator. The regulator can then certify the data, making it officially eligible to enter into the registry.

"Validation" is related to verification, but is typically used only in the context of emission reduction (or removal enhancement) offset projects. Validation is the process in which an independent third party assesses the (ex ante) probability that implementation of an offset project will result in greenhouse gas emission reductions (or removal enhancements) as stated by the project developer. Then after the offset project has been implemented (ex post), any greenhouse

[6] Other professional fields also refer to this process as "auditing." The term "certification" is used to describe this process under the California Climate Action Registry (CCAR); however, certification more universally refers to the final administrative approval of a submission.

[7] For example, if a State intends for the data reported under a voluntary program to be used, in the future, for regulatory recognition under credit-for-early-action or other scheme, then verification resources should be devoted to the voluntary program in keeping with the future data quality requirements of the data.

gas emission reductions or removal enhancements must be verified before the project is awarded greenhouse gas credits.

This paper will provide general recommendations on the design of a verification system for all of the programs expected to be supported by RGGR, including mandatory and voluntary emissions reporting programs and the RGGI emissions trading and project offset program being developed and considered by Northeast policy makers. Specifically, the paper will consider the focus of the reporting system as it relates to the verification system design, the verification process, and data handling and documentation issues. The paper's recommendations are based on a preliminary review of existing voluntary and mandatory greenhouse gas reporting and emission trading programs and the practical experience of Environmental Resources Trust.[8]

The specific design and rigor of the verification approach used for each type of State or regional greenhouse gas program will, by necessity, vary. This paper, therefore, presents specific recommendations by program type in addition to providing general recommendations. The differences in verification approaches for each program type are intended to balance cost considerations with expectations for data quality assurance. Lastly, we provide a list of next steps necessary to implement the verification system described in this paper.

2 RGGI/RGGR program types

The States participating in RGGR have decided that the registry should support three broad categories of activities: (1) voluntary reporting; (2) mandatory reporting; and (3) the RGGI process, as described below:

Voluntary reporting: The registry will support the voluntary registration of emissions from companies and their facilities. The registry will provide sufficiently rigorous and detailed information to permit States to document the baselines of registry participants.

Mandatory reporting: The registry will support reporting of greenhouse gas emissions mandated by State regulatory schemes.[9]

RGGI reporting: Though many design decisions are yet to be made, RGGR is expected to serve as the emissions and allowance tracking system for participating RGGI States. Moreover, RGGR is expected to become the repository for project-based emissions reductions or offset credits to the extent such reductions and offset credits are recognized by RGGI.

In practice, it will likely be necessary for RGGR and the verification system associated with it to support a collection of State and regional programs. There will be some variation between the goals and requirements of each distinct program. These differences will necessarily translate

[8] Funding for this work was insufficient to complete a thorough evaluation of the experience of existing reporting and emissions trading programs.

[9] In an effort to promote consistent reporting among the participating States, NESCAUM and the RGGR participating States are in the process of elaborating design criteria for an ideal State mandatory reporting program. A model rule and/or a model regulatory guidance document for greenhouse gas reporting based on these criteria will be developed for use by States choosing to require mandatory reporting of greenhouse gas emissions.

into varying levels of assurance demanded of the data collected by each program, and therefore to differences in the rigor of the verification approach required.

For the purpose of designing specific verification approaches for each program, it is more instructive to expand the list of three broad program types above to six more specific program types.

(1) Voluntary reporting
(2) Mandatory reporting
(3) RGGI cap-and-trade
(4) RGGI project offsets
(5) RGGI expansion to non-Acid Rain Program facilities
(6) Voluntary project reporting outside of RGGI[10]

The three additional program types in this list have been explicitly identified because of the different verification issues they pose. Although it is part of RGGI, a project offset provision entails significantly different issues for the design of a verification system than a cap-and-trade program for stationary combustion facilities. Although no specific plans are known to exist, the future expansion of RGGI may require or allow facilities not covered under the U.S. Acid Rain Program to enter the RGGI cap-and-trade program. Lastly, we address the voluntary reporting of project offsets not included under the RGGI program. The recommendations in this paper will focus on the first four program types, but for the sake of completeness, recommendations for types 5 and 6 are also briefly discussed.

3 Definitions

Because the field of the verification of greenhouse gas reporting and emissions trading is still in its early stages, the terminology used in the field has yet to be standardized. The list below provides definitions of the some of the key terms used in this document that are relevant to a verification system for RGGR and RGGI.

Accreditation is the official authorization of private 3rd party verifiers to conduct verification activities.
Additionality refers to the contribution of an offset project to reducing the loading of greenhouse gases in the atmosphere relative to what it otherwise would have been in the absence of the project. A project that meets the criteria of being "additional" refers to an activity that does not reflect "business as usual."
Audit trail is the historic data and supporting information that are available for examination in order to evaluate the quality of a greenhouse gas inventory and which allow material misstatements to be detected.
Baselines are the time-dependent metric against which the effectiveness of an offset project is judged. The "baseline" case is also known as the "business as usual" situation and is used for comparison to gauge the greenhouse gas effects of an offset project.
Certification is the process by which a regulator or administrator of a greenhouse gas reporting program issues a formal acceptance of a greenhouse gas inventory or emission reduction calculations.

[10] Currently, there are no explicit plans by any of the Northeast States to establish a voluntary project reporting program.

Conflict of Interest (COI) is a situation in which, because of other activities, or relationships with other persons or organizations, a person or firm is unable or potentially unable to render an impartial verification opinion on a potential client's greenhouse gas emissions, or the person or firm's objectivity in performing verification activities is or might be otherwise compromised.
Direct emissions are greenhouse gases that are physically emitted by equipment owned or controlled by the reporter (e.g., onsite stationary fuel combustion). These emissions are categorized as Scope 1 by the WRI/WBCSD *GHG Protocol*.
Emerging COI is a potential or actual COI situation that arises, or becomes known, during verification or for a set period of time after the completion of verification activities.
Field audit is the act of physically visiting a reporting organization's facility and conducting onsite verification activities (also referred to as a "site visit").
Indirect emissions are greenhouse gases emitted to the atmosphere that are affected by the activity of a reporter, but are produced and emitted from sources outside the direct control of the reporter. These emissions fall under the WRI/WBCSD *GHG Protocol's* Scope 2 and 3. Scope 2 activities include purchased electricity (and heat). Scope 3 comprises "other" indirect emission sources.
Leakage refers to greenhouse gas emission changes (increases or decreases) outside of a project boundary as a result of the project activity. In cases where greenhouse emissions increase, the increased emissions must be subtracted from gross reductions to determine the net emission reductions achieved by the offset project.
Material misstatement is an inaccurate assertion of significance, relative to the reporter's overall greenhouse gas emissions, that reasonably influences decisions or actions taken by other users of the greenhouse gas inventory data (and of any associated verification statement), due to an individual or aggregation of errors or omissions. The determination of a material misstatement is inherently one of professional judgment (also referred to as "material discrepancy").
Offset project is an activity in an uncapped sector or an uncapped source that generates greenhouse gas emission reductions (or removal enhancements), relative to a baseline case, over some period of time.
Operational boundaries determine the sources of direct and indirect emissions associated with facilities and activities owned or controlled by a reporting entity (e.g., corporation).
Organizational boundaries define the physical facilities and activities owned or controlled by the reporting entity (e.g., corporation), depending on the consolidation approach taken (e.g., equity or control approach).
Organizational COI relates to instances where the ability of a verifier to render objective verification services may be affected by the services provided by, shared management and/or financial resources with, or other situations created by a parent company or other related entities.
Personal COI is a relationship of an employee that may impair the objectivity of the employee in performing a verification.
Validation is the process of (*ex ante*) independent evaluation of an offset project's design, baseline, and proposed monitoring and verification procedures to ensure that the project's performance will be adequately monitored against the baseline and that the project conforms to applicable rules and requirements.
Verification is the (*ex post*) confirmation, through provision of objective evidence by an accredited verifier, of (1) the greenhouse gas emissions information submitted by a reporter or

(2) the monitored reduction or removals in anthropogenic greenhouse gas emissions that have occurred as a result of an offset project activity.

The definitions above are based on those developed by the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance, International Standards Organization (ISO) 14064 Part 3 standard, the WRI/WBCSD *GHG Protocol*, the California Climate Action Registry (CCAR) Conflict of Interest Policy, and the Environmental Resources Trust (ERT) *Corporate Greenhouse Gas Verification Guideline.*

4 Verification principles

In designing an environmental reporting or emissions trading program, the process for quantifying and verifying environmental data—whether it be reported voluntarily or under a mandatory compliance regulation—should be as objective as possible. The first step in achieving this goal is the creation of a detailed and unambiguous standard (i.e., monitoring and reporting rule or regulation) against which data can be verified. However, despite the level of specificity in a reporting standard, it is often impossible to completely eliminate the need for good and unbiased professional judgment by verifiers. In the context of verifying greenhouse gas emissions reporting, this professional judgment should be guided by the following principles:

- **Completeness**. Include all greenhouse gas emissions (and removals) within the facility or project's boundaries. Any exclusions should be disclosed and justified.
- **Time series consistency**. Ensure that methodologies, data, or other relevant factors are consistent over time, thereby producing an unbiased trend in emissions or removals.
- **Accuracy**. Ensure that the quantification of greenhouse gas emissions (or removals) is systematically neither over nor under actual emissions (or removals), as far as can be judged, and that uncertainties are reduced as far as practicable.
- **Transparency**. Document and disclose, based on a clear audit trail, all relevant assumptions, references, data, and methodologies in a factual and coherent manner.
- **Relevance**. Support the decision-making needs of users by applying appropriate greenhouse gas emission (or removal) methodologies and data gathering techniques. Sufficient accuracy is achieved to enable users of verified information to make decisions with reasonable assurance as to its integrity.
- **Independence**. Remain independent of the activity being verified and free from bias and conflict of interest. Maintain an objective state of mind throughout the verification process to ensure that the findings and conclusions will be based only on objective evidence generated during the verification.
- **Ethical conduct**. Demonstrate ethical conduct though trust, integrity, confidentiality, and discretion throughout the verification process.
- **Fair presentation**. Reflect truthfully and accurately verification activities, findings, conclusions, and reports. Report significant obstacles encountered during the verification process and unresolved or diverging opinions between the verification team, the reporter, and the regulator.
- **Due professional care**. Exercise due professional care and judgment in accordance with the importance of the task performed and the confidence placed by clients and stakeholders. Have the necessary skills and competences to undertake the verification.

The principles above are based on those contained in the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance, International Standards Organization (ISO) 14064 Part 3 standard, and the WRI/WBCSD *GHG Protocol*.

5 General verification issues and recommendations

In the remainder of this paper, we will provide recommendations on the verification issues listed below:

- Reporting and verification system design
  - Reporting and verification system focus
  - Verification system design
  - Accreditation process
  - Funding scheme
  - Liability and legal sanctions
- Verification process
  - Verification rigor (risk based)
  - Verification steps
  - Conflict of Interest (COI)
  - Material discrepancy and *de minimus* tests
  - Dispute resolution
- Data handling and documentation
  - Verification statements
  - Confidentiality and non-disclosure agreements
  - Record keeping and retention

These issues were identified to be the most important for the initial design of a verification system. Once the States have reached agreements on these issues, more detailed guidance and procedures for the implementation of verification should be developed.[11]

The approach to verification employed for each of the six program types will be a function of the program's goals and the preexisting legal and regulatory context within each State.[12] However, the core issues for the design of a verification system are, for the most part, common across program types and States. It is assumed that part of the impetus behind the establishment of a regional initiative and registry is to lower (public and private) administrative and compliance costs and increase the effectiveness of greenhouse gas policies through regional coordination instead of creating duplicative processes in each State. Therefore, we assume that it is a desirable outcome of the RGGR and RGGI processes that the verification system be centralized and harmonized, to the extent politically and legally practical, across the region and across program types. However, differing State programs and pre-existing legal and regulatory procedures may necessitate some differentiation at the State level.

[11] Specific recommendations on next steps are provided in the final section of this paper.

[12] Although federal law, in the form of the Clean Air Act, does provide a common framework

This section (5) addresses recommendations that are common, for the most part, across program types. In the following section (6), program-specific recommendations (and deviations from the general recommendations) will be provided.

5.1 Reporting and verification system design

In designing a verification system for the mandatory, voluntary, and RGGI programs, the first decision point relates to the question of centralization. Will the administration of the verification system be centralized, to the extent practical, at the regional level, or will each State design and implement its own verification system? We recommend, for the sake of efficiency, that the administration of the verification system be centralized at the regional level to the extent legally practical. Although verification tasks may be preformed by independent 3rd party verifiers and/or program administrators within each State, the overall procedures and administrative framework should be common across States to the extent practical so as to share development and administrative costs and ensure a minimum level of data quality and format harmonization.[13]

Before discussing specific reporting and verification system design issues, it is necessary to classify the various roles and responsibilities for verification. Much of the confusion surrounding the topic of verification is the use of inconsistent terminology regarding these roles and responsibilities. In order to eliminate this confusion, we have mapped a verification system—in the broad sense—across three parties and three subjects of verification-like activities.

The three parties are:

- The reporting entity (reporter)
- A third party entity that performs verification activities (verifier)
- The policy maker or program administrator (regulator)

The subjects of review and selection by a verification-type activity are:

- The greenhouse gas emissions inventory (or offset project documentation)
- The qualifications of the verifier
- The verification statement

The table below combines each party and each subject in a matrix, where the party performs a review function on a given subject, and summarizes the terminology of verification or compliance review functions.[14]

[13] A centralized approach to verification is being taken by the government of Canada. They have established a Verification Centre under Environment Canada in cooperation with Natural Resources Canada. This Centre and the verification system produced by it are intended to support a variety of government initiatives, including project-level and emissions trading initiatives. (See www.ec.gc.ca/pdb/ghg/ghg_vc_e.cfm) The verification and accreditation protocols being developed by the Centre may provide a useful model for RGGR and RGGI.

[14] This table does not address the (ex ante) validation of offset projects. This issue will be discussed in the program-specific recommendations sections on RGGI and voluntary offset projects.

Table 1: Basic verification or compliance review functions

Subject Party	**Inventory or project data**	**Verifier qualifications**	**Verification statement**
Reporter	Internal quality management	Verifier selection*	Review prior to submission
Verifier	3rd Party Verification	-	-
Regulator	Compliance Audit and Certification	Accreditation of verifiers and COI evaluation	Review prior to certification

* The reporting entity may select an accredited verifier unless it is assigned to them by the regulator.

The effort required for each of these functions will vary by program type in accordance with the program's goals. A purely voluntary reporting program with no pledges of credit for early action may require less effort for each review function, including the elimination of the compliance audit function entirely. In contrast, a cap-and-trade system may require a high level of effort for the compliance audit function. However, policy makers should be aware that if unverified or poorly verified data is allowed to enter the registry for a voluntary program, it is likely to be relatively useless under a regulatory program.

Legal issues related to administrative centralization

For the purpose of the verification of submissions made by private parties under a greenhouse gas emissions reporting or trading program, whether the "regulator" is a State agency or a regional body could have significant legal implications. Having a State agency act as the regulator, even if the agency follows voluntary guidelines created by an interstate working group, should not raise legal issues. However, the creation of a truly interstate regulatory body with binding authority would certainly require approval of the States creating the regulatory body and may require approval by State agency commissioners, the governor, and/or the State legislature.[15]

Given the likely design of RGGI, we recommend that a similar process to the "model rule" be followed for the design of the verification system for RGGR. A model verification rule, including detailed requirements and guidelines, should be developed. An interstate verification/certification body composed of State government regulators from each participating State should be established to administer the overall verification system. The verification/certification body can make recommendations on certification and other issues, while leaving final decision making authority in the hands of each State's representative to the body.

In general, the intention behind requiring third party verification is to maximize the reliability of the data reported to the registry, while minimizing the compliance audit and certification costs incurred by the regulator (i.e., program administrator). However, in the process the regulator may only shift costs to other functions, such as accreditation or review of verification statements.

[15] Assuming States are willing to cede some of their sovereign power to an interstate body, the creation of such a body could be subject to challenge on the grounds that it is in conflict with the "dormant commerce clause" of the U.S. Constitution (which reserves to the Federal government the power to regulate interstate commerce) or is somehow preempted by federal law, but the outcome of those challenges likely rests more on the substance of the regulatory scheme rather than the mere creation of an interstate regulatory body.

Assuming reporters pay for their own 3rd party verification, additional costs may be shifted onto the reporters. This dynamic may be further exacerbated if the requirements for the accreditation process, verification statements, and verification procedures are ambiguous or poorly designed.

Legal issues related to the use of private 3rd parties as verifiers

The use of 3rd party verifiers represents a privatization of a function—the review of environmental information submitted to a government body—that has historically been performed by government agency staff. The legal and professional role of 3rd party verifiers, as described in this paper, is similar to that of accountants and lawyers. We do not foresee a significant legal barrier to the use of 3rd party verifiers for any of the program types discussed above. For example, various State contaminated site cleanup programs make use of specially licensed environmental consultants to conduct investigations and monitor contaminated sites. The delegation of these types of public interest functions to private 3rd parties, however, requires appropriate procedures to ensure conflicts of interests do not exist. In addition, regulators may be legally unable to delegate their discretionary authority to private parties and it may be imprudent to do so as a matter of public policy. In general, third party verifiers should have their role largely restricted to data gathering and analysis. Discretionary decisions regarding interpretation of regulations, accreditation, certification, whether to undertake enforcement action, and what kind of enforcement action to undertake are best left to government staff.

5.1.1 Reporting and verification system focus

The second critical decision point in the design of a verification system is specifying the definition of the reporting entity for each program type so as to determine what is to be verified. The design criteria for RGGR specify that both corporate and facility-level data will be required for reporting to the voluntary, mandatory, and RGGI programs that are supported by it. [16] The question, then, is at what reporting level(s) should the verification system focus on for these programs—at the corporate-level, facility-level, or both?

Whether the focus of verification is on facility-level data or corporate-level data has dramatic implications for the design of the verification system. We strongly recommend that the verification system for all programs that are supported by RGGR be focused on exclusively, or at least primarily, on facility-level data. Focusing the verification process on facilities, versus at the corporate-level, avoids a host of unnecessary complications that arise with corporate-level reporting while vastly increasing the credibility and transparency of the data in the registry. It also allows for a verification system design that can minimize both the public and private costs of verification without sacrificing data quality.[17] More importantly, the mandatory reporting frameworks under existing environmental laws and regulations are almost universally focused on stationary facilities (or activities in the case of mobile sources).[18]

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[16] Corporate-level data is to be reported following guidelines of the WRI/WBCSD *GHG Protocol*.

[17] Focusing the verification process on facilities, versus at the corporate-level, reduces the scale of the effort required for each verification—although, depending on the design, it may increase the total number of verifications required for a given program. The verification system design in this white paper is based on a risk-based rating approach that functionally samples only certain facilities each year for verification based on the likelihood and implications for a material misstatement for the reporting program as a whole. Therefore, the overall cost of verification for one or more programs can be limited.

[18] For example, almost all large stationary combustion facilities in the United States are permitted by the State under the Clean Air Act.

An argument in favor of a focus on corporate-level reporting is that it can give a full picture of a company's total emissions and potentially capture facilities outside the RGGR region. However, the inclusion of corporate-level reporting in a program is completely compatible with a focus on facility-level reporting and verification. Programs can allow or require companies to report on all facilities in and outside of the region (on any organizational boundary basis). This facility-level data can then be aggregated to provide the relevant corporate totals. It is important, though, that each facility should have only one record in the registry database. Additional data can be attached to each facility's record that identifies the corporate "ownership(s)" or "control" of the facility.[19] The benefit here is that the registry would only maintain one record for each facility, and therefore existing registry software could be used.[20] This approach would also avoid problems with inconsistent data being maintained in the registry for the same facility in two separate corporate records (i.e., cases of joint control or ownership). The facility-level approach also minimizes a host of other verification problems, such as how to deal with complex leasing arrangements or partial-year ownership.[21]

Another argument is that corporate-level reporting is less burdensome to companies. First, it is not at all clear that this assumption is true. It is probably as likely that reporting will be less burdensome at the facility-level for the reasons discussed here. Regardless of their relative burdens, the design criteria for RGGR includes a requirement for facility-level data (as well as unit-level data, where appropriate). Some companies that aggregate their data at the headquarters level may initially find it burdensome to provide facility-level data. However, after they have established the appropriate corporate information systems, systems based on reporting by facilities should be easier to maintain—than the tracking of organizational boundaries over time—and are more likely to provide the type of disaggregated data necessary to identify and provide incentives for mitigation opportunities within the company.

If the ultimate goal for the data in the registry is baseline protection or to otherwise prepare for a future mandatory program, then much of the effort expended—particularly the to verification and tracking of changes in corporate organizational boundaries—will likely have been wasted, as future regulatory programs will necessarily operate at the facility level.[22]

Detailed and legally defensible definitions of "facility" will have to be developed for both reporting and verification purposes. These definitions will have to address all types of sources (and sinks) included in each program.[23] Ideally, these definitions will be industrial activity-

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[19] This approach is analogous to how U.S. EPA's Toxic Release Inventory (TRI) is structured, which provides both facility and company level data.

[20] For example, transactional registry systems such as EPA's Emissions and Allowance Tracking System (EATS).

[21] If desired by a particular program, requirements could also be included to verify the corporate total, but this should in no way be at the expense of verification activities at the facility-level. See box below titled "Alternative formulations of verifier assignment and/or selection." Assuming that registry data is made publicly available, we expect that activities of "watchdog" groups will be adequate to ensure that corporate ownership data is reported accurately, as occurs under TRI.

[22] Based on the opinions of several environmental lawyers, requiring compliance for an emissions trading or other permitting process at the corporate level is likely to be legally unenforceable.

[23] It is not clear how non-stationary combustion facilities would or could be further disaggregated into "units." Therefore, the designation of unit-level data may only be applicable to stationary combustion. Existing registry software is capable of allowing this distinction to be made.

specific and will be based on existing environmental regulations. Useful guidance may be available through EPA's Toxic Release Inventory (TRI) and the European Union's Emissions Trading System, as well as the U.S. Acid Rain Program (see box below). The more detail included in these definitions for each industrial sector, source category, and activity, the less will be left for reporters and verifiers to interpret. Increased ambiguity in any regulatory program tends to lead to greater administrative and legal costs and less comparable and consistent data.

Complications with verifying corporate-level inventory data

- If verification is performed at the corporate-level, then the process will be complicated by the need to verify the organizational boundaries, especially for large corporations. Corporate-level verification will necessarily focus on the headquarters unit or central office that has overall responsibility for compiling and reporting the corporate inventory and the inventories of subsidiaries, divisions, business units, joint ventures, and other entities that may be considered as organizational components. The verification of corporate-level data also focuses on the company's basis for including (or excluding) facilities in the corporate inventory. As a result, a significant portion of the verification effort is expended to confirm what should be included in the corporation's report. The burden is increased if reporting is done on multiple bases, such as equity share, operational control, and/or financial control. Operational control is likely to be the least burdensome to verify. Reporting on an equity share or financial control basis will likely require a review of the company's financial and accounting information as well as its greenhouse gas emissions data and systems. In contrast, when verification is performed at the facility-level, these issues are, for the most part, irrelevant.

- The organizational boundaries of corporations tend to change over time, especially for larger corporations. Because many companies continually undergo mergers, acquisitions, and divestitures, a verification process focused on the corporate-level will be required to review not only the most recent year's report, but it will also have to revisit the entire historical time series of reports every year to ensure that recalculations have been performed properly. In contrast, when verification is performed at the facility level, the process can focus almost exclusively on the most recent year's data.[24]

- Complications arise for the design and maintenance of a registry database when records are defined at the corporate instead of facility-level. For example, it is unclear how the registry will handle historical data for a facility that is sold to another company. Will there be a procedure for reallocating all of the facility and unit level data in the registry each year as corporate boundaries change? If the reporting programs supported by RGGR are to focus on corporate-wide emissions reporting, versus facility-level reporting, as the primary metric for evaluating emissions over time, then serious attention will have to be given to how the continuous "morphing" of corporate entities will be estimated, verified, and tracked in the registry. To date, registry software systems that track emission at the facility-level have not been developed to track changes in corporate forms over time.[25]

[24] During the each year's verification process the verifier will still review the time series consistency of the facility's data. However, historical data is not expected to change, except in cases where calculation errors are identified.

[25] The degree to which modifications would be necessary in EATS to enable the tracking of changes in corporate boundaries over time, including revisions to historical data, is not clear.

Example of general stationary combustion definition (without size specification)

A **facility** includes all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person or entity (or by any person or entity which controls, is controlled by, or is under common control, with such person or entity). Facilities are also referred to as **installations**. Several distinct types of business activities may occur at a single facility, each of which may operate one or more combustion units. A **combustion unit** is an individual fuel-fired combustion device (e.g., boiler).

For example, a facility owned and operated by an electric power company can house two business activities. The primary activity will likely be electricity generation and may include several combustion units (as well as generators, pollution control equipment, etc.). The same facility could also contain a maintenance shop for the company's transmission line equipment, which may be classified as a separate business activity. The maintenance shop may itself include a combustion unit such as an emergency diesel generator or compressor engine.

Note: Based on definitions from U.S. EPA Emergency Planning and Community Right-to-Know Act (EPCRA), Toxic Chemical Release Inventory (TRI) guidance. The specific legal definition of facility or installation may differ across jurisdictions. The definitions provided above are meant to be instructive for the purpose of this guidance document only and may not be representative of all applicable legal definitions.

The general definitions in the box above are for stationary combustion sources. Different definitions may be required for non-combustion sources and other activities, such as mobile sources. If direct emissions from mobile sources are reported, we recommend that each facility report on the emissions from vehicles under its operational control.

If reporting programs are based on corporate-level reporting, then reporting and verification rules may be needed to enable small-scale organizations to partner-up (e.g., through a trade association) and report their greenhouse gas emissions together as a bundle. This type of batch or bundle verification is not necessary or more cost efficient when reporting is done on a facility basis (see section below on verification rigor for a more thorough explanation).[26]

Lastly, from the standpoint of designing an effective and efficient verification system, we recommend that reporting primarily focus on a facility's direct emissions (i.e., Scope 1). Indirect emissions (i.e., Scopes 2 and 3) are inherently more uncertain and therefore more difficult to verify than direct emissions. The reporting of Scope 3 activities is particularly open ended. If Scope 2 activities are to be reported and verified, then the verification process should focus exclusively on confirming data on the kilowatt hours of electricity or purchased heat consumed. This approach to verifying Scope 2 activities avoids the inherent complications with double counting of emissions and the problem of agreeing on a fair and accurate indirect emissions factor for grid-connected electricity use.[27] In all cases, reporting of under each scope should be separately identified in the registry.[28]

[26] We assume that a system focused on facility-level reporting that the reporting burden for a single facility would be reasonable for a small organization.

[27] Although this paper does not discuss this issue in detail, the problem relates, in part, to double counting of emissions and the differences in marginal and average emissions intensity of electricity use.

[28] Registry software products, such as EATS, are currently designed for the tracking of direct emissions only.

5.1.2 Verification system design

Our recommendations for the design of the verification system for mandatory, voluntary, and RGGI programs are based on the assumption that functions will, to the extent practical, will be centralized regionally, while taking advantage of the existing permitting and other State- level environmental compliance auditing activities.

In general, we recommend that the verification system be based on the following process:[29]

(1) A regional accreditation board creates and maintains a pool of accredited 3rd party verifiers
(2) A verification/certification body produces a risk-based rating for each facility report submitted to a program
(3) The verification/certification body assigns a verifier from the pool to each facility
(4) A COI evaluation committee determines if the selected verifier is appropriate[30]
(5) A verification/certification body reviews the final emissions inventory report and verification statement
(6) The verification/certification body certifies and registers the facility-level inventory report

We will describe and recommend below a risk-based approach to determining the rigor of verification activities for individual facility reports. In general, this risk-based approach would rate each facility report under each program; the rating then determines the verification effort to apply to that facility. The risk-based approach allows the administrators of each program to select their own balance between data quality assurance and verification costs. In order to efficiently implement this overall verification system design and address COI issues, we recommend that the program administrator (and/or the verification/compliance body) assign a 3rd party verifier to facility reports whose rating results in a requirement for 3rd party verification as one of the verification activities. This rating process should be based on several factors such as the size for the facility, the likely uncertainty in the estimation methodology used, and other factors that create a potential material discrepancy. Ideally the majority of this risk rating process should be automated, but the system should also include procedures for randomly selecting some low-risk facilities for verification activities generally reserved for high-risk facilities.

The centralized verification system recommended here will need to include the functions of several administrative bodies composed of State government, RGGR, and/or other staff. A verification/certification body should oversee verifier assignments, compliance audits by government staff, review of verification statements, and certification of inventory reports. In addition to this body, the system will also require an accreditation board, a COI evaluation committee, and a dispute resolution committee. The functions of these various bodies are discussed in more detail in the sections below.[31]

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[29] A more detailed description of this process, including risk-based rating, is provided in the sections below.

[30] A less thorough case-specific COI evaluation is necessary for verifiers that have been assigned versus selected by a facility operator or company.

[31] The CCAR includes similar administrative bodies to the ones outlined here, and may provide a useful model for RGGR.

5.1.3 Accreditation process

The accreditation of 3rd party verifiers should require the (1) creation of an accreditation board to evaluate applications and make determinations, (2) elaboration of specific accreditation requirements, (3) enlistment of a dispute resolution committee for cases of disputed disqualification, (4) enlistment of an organizational COI evaluation committee, and (5) development of a verifier training course and associated exam.[32]

In order to leverage expertise, the accreditation process for RGGR verifiers may be conducted in collaboration with an existing national, regional or international accreditation organization (e.g., the international register of certified auditors). We also recommend that the new ISO 14064, Part 3 standard on verification and validation of greenhouse gas emission assertions be used as a starting point for the development of a training course.

The elements that should be included in the accreditation process for verifiers are:

- A requirement for adequate staffing and the appropriate training and expertise of that staff (requirements may be specific to each industry sector)
- Requirements for financial stability and to hold professional liability insurance of a specific amount (e.g., $5M for any one or more claims) with a reputable insurer[33]
- A requirement that verification team leaders sign and assume responsibility for all statements made by the verifier, including work by any other staff, employees, or contractors[34]
- Agree to be bound by confidentiality obligations and accept liability for breach of confidentiality
- Agree to provide the regulator (i.e., program administrator) access to all verification records, if requested
- Sign an agreement stating the verifier's intent to comply with COI requirements, including a statement attesting to the fact that the verifier has the capability to conduct case-specific COI evaluations in keeping with the program's requirements
- Pass a screen for generic organizational COI
- Notify regulator of changes in staffing, COI status, liability coverage, etc.
- Complete training workshop on the fundamentals of the verification process and require all team members to pass an exam
- Accreditation requirements should be according to specific sectors or industries and may be specific to programs or program types

We recommend the development of a single regional accreditation process for all program types utilizing RGGR in order to minimize development and administrative costs. We recommend that most of the requirements for the accreditation of verifiers be the same, regardless of the program under which they are conducting verification activities. However, the barriers to entry for

[32] The ongoing work under the ISO 14064 (part 3), Canadian Verification Centre, and the various Member States under the EU-ETS should provide valuable input for the development of a RGGR verifier accreditation process.

[33] The requirements for financial stability and liability coverage may differ by program type in order to allow a broader participation of verifiers under voluntary programs, relative to mandatory ones.

[34] Contractors should be accredited as part of the original verification team.

verifiers can be significantly lowered by reducing the accreditation requirements for financial stability and liability coverage for some programs such as a voluntary reporting program.[35]

We recommend that each verifier's accreditation application undergo a desk review by the accreditation board, although the board may choose to conduct interviews on an ad hoc basis. We have no specific recommendation for the time period before a verifier must be re-accredited.[36] We do recommend that any requirement for a set number of years be reevaluated and modified based on experience. We also recommend that specific procedures and grounds for disqualification be elaborated.

Accreditation requirements should be based on the qualifications of specific proposed verification team(s), not the overall organization applying. The accreditation process may separately identify lead verifiers and staff. The composition of actual verification teams should then require a minimum mix of lead verifiers and staff. Accredited verifiers must also be required to submit information on changes in lead reviewers or staff for review by the accreditation board, which may revoke accreditation for particular industries if staff levels fall below a minimum experience threshold. Failure to notify the accreditation board of changes in staff or other status within reasonable amount of time should be grounds for disqualification from the list of accredited verifiers.

If a verifier has already been accredited under CCAR or the Clean Development Mechanism (CDM) as a Designated Operational Entity (DOE), then the information supplied for those accreditation processes should be able to substitute for a portion of the RGGR accreditation application. Similar provisions should be considered for accreditation applicants with other relevant professional accreditations (e.g., professional engineer, energy auditor).

5.1.4 Funding scheme

We recommend a fee-based funding scheme for the verification system for all programs supported by RGGR. Separate fees could be collected by the regulator for the following:

- An accreditation application fee from verifiers
- A re-accreditation application fee from verifiers
- A verification training course fee from verifiers
- A verification course exam fee from verifiers
- A case-specific COI evaluation fee from verifiers and/or reporters
- A verification fee from reporters
- A certification and registration fee from reporters (all reporters pay the same fee for a given program)
- A fee for utilizing dispute resolution process

These fees may differ by program type, the "risk rating" (see below) required for verification, and the administrative burden on the regulator. The use of multiple fees allows reporters and

[35] Using this approach, verifiers meeting the highest financial stability and liability coverage requirements may be accredited to serve all RGGR-supported programs, while verifiers meeting the minimal requirements may only be accredited to serve voluntary reporting programs.

[36] The California Climate Action Registry (CCAR) requires re-accreditation every 3 years.

verifiers to take a step-wise approach to participation without committing to the full cost, thereby lowering the investment barrier to participation and building capacity in the private sector.

The payment received by a verifier for conducting a verification, under this funding scheme, would be determined and paid for by the regulator. The payment would need to be set based on an economic analysis along with stakeholder interviews/negotiations. This approach is possible at a facility-level because common metrics can be developed for payment (e.g., facility size or risk rating for verification).

Whether the fee structure will be sufficient to fully fund each reporting program—including the cost of verifier payments—or whether additional government funding will be necessary—depends on the economics (and politics) of each program. One of the primary benefits of a centralized fee and payment scheme is that it avoids the transaction costs of many bilateral contract negotiations between reporters and verifiers. This is an important design element for the case of facility-level reporting because of the larger numbers of individual reports, compared to corporate-level reporting. It would be extremely burdensome if each facility had to negotiate a separate contract with a verifier. Alternatively, if a parent company or aggregator negotiated a large contract with one verifier for many facilities, then potential COI problems could arise and small unbundled facility owners would be at a disadvantage.[37]

The use of this type of fee structure is relatively common. Regulators are typically authorized under State law to charge filing or user fees. Unless otherwise limited or prescribed by statute, an agency can usually seek to use such fees to recover its administrative costs (e.g., processing a permit application or managing a regulatory system). For example, under the Massachusetts Superfund program a site owner is required to pay fees for filings and an annual fee for record keeping. Similarly, it is common practice in the local permitting context for a board to have a developer pay the cost of a traffic or engineering consultant to review the developer's application. The California Climate Action Registry also charges a single annual registry fee that is based on the size of the company reporting, measured in terms of revenue. The verification payments under CCAR, however, are negotiated between the reporter and the verifier without any involvement of the program administrator. In contrast, under the U.S. EPA's Climate Leaders program, review costs are paid by EPA.

Standard contracts and agreements for confidentiality, payment, terms of service, etc. should be developed to minimize the burden of the process. An electronic billing system should also be established so that money can be quickly and efficiently debited from an account by the regulator once approved by the reporter or verifier.

5.1.5 Liability and legal sanctions

In general, the penalties for noncompliance with a program and the potential liability faced by a reporter or verifier can be a powerful incentive for accurate reporting and review. Decisions addressing liability and legal sanction issues for the verification system are likely to be some of

[37] An alternative formulation might offer companies the option to select their own verifier for all of their facilities, but would require the payment of a larger case-specific COI evaluation fee. Limits on the number of consecutive verifications the same verifier could perform would then need to be established. The default option would be for a verifier to be assigned to the company or each facility.

the most critical ones made by policy makers, as they will in large part determine the quality of registry data, the cost of reporting, and the level of participation in each program.

There are a number of ways to define (i.e., limit) the liability of a verifier for the accuracy of their verification statements and their compliance with verification system rules. These include, but are not limited to:

- No liability on the part of the verifier
- Liability only for the cost of providing a replacement verifier if they have been found in violation of their contract or other agreement
- Liability to provide a replacement verifier, plus reimbursement for the cost of the reporter's wasted staff time
- Liability for the current value of excess emission allowances or emission reduction credits directly related to its verification efforts
- Liability for other limited or unlimited penalties and/or damages

We provide general recommendations for how to define the liability requirements for verifiers under each program type in the section below on program-specific recommendations. As an example of the requirements of a voluntary reporting program, the California Climate Action Registry (CCAR) limits the liability of verifiers to the cost of hiring a replacement verifier, but also permits additional liability limits or extensions to be specified in a bilateral contract between a reporter and a verifier. In contrast, the verifiers under the Kyoto Protocol's Clean Development Mechanism (CDM), which forms part of a mandatory emission reduction program, are liable for the value of all excess credits they verify improperly.

We do recommend that the liability required of verifiers vary according to program type and that verifiers be required to demonstrate that they have sufficient arrangements to cover legal and financial liabilities arising from their activities (e.g., professional liability insurance coverage). We also recommend that there be enforcement and significant legal and/or financial sanctions for a reporter or verifier that knowingly provides false or misleading information to the regulator.

5.2 Verification process

This paper focuses on the design of a verification system for RGGR and does not elaborate specific verification procedures.[38] However, there are a number of design issues related to the implementation of verification procedures that are important, such as an approach for determining the rigor of verification activities to be applied to an individual facility report, the general steps of the verification process, COI issues, an approach to materiality and *de minimus* tests, and the establishment of a dispute resolution process.

5.2.1 Verification rigor

Although the type of information reviewed by a verifier is generally the same regardless of the subject being verified, the rigor of the verification process should differ by program type.[39]

[38] The elaboration of more specific procedures should follow the development of detailed monitoring and reporting protocols upon which the reporter is later verified against.

[39] Offset projects do present distinct types of information for review, however.

The model for verification followed by many existing voluntary reporting programs at the corporate-level has proven to be expensive and has provided a low level of assurance as to the accuracy and transparency of emission reports. The approach recommended in this paper is based on a compliance risk model where verification (i.e., audits) is based on facility-level data and a measure of the risk that a material discrepancy (i.e., a combination of likelihood and magnitude) is above a particular risk threshold established for the program as a whole.

Using a risk-based approach, all facility reports would be labeled as high, medium, low, or zero risk. According to its label, a facility report would undergo one of the following verification processes:

- Zero risk: No verification necessary beyond initial automated submission check
- Low risk: Regulator (i.e., verification/certification body) conducts basic desk review
- Medium risk: A thorough desk review by a 3rd party verifier
- High risk: A thorough 3rd party verification process including field audits followed by a review by regulator (i.e., verification/certification body)

High risk facility field audit teams may also include program administrator staff to accompany the 3rd party verifier. The risk rating procedure should include some provision for the random selection of facility reports to undergo a thorough desk review and/or field audit.

The risk rating process should account for the goals of the relevant greenhouse gas program, size of facility (in terms of emissions or some reasonable proxy for the likely quantity of emissions), past verification findings, potential problems identified in an initial automated screen, and the judgment of the verification/certification body.

The benefit of using a risk-based verification approach is that it can limit the costs for both reporters and regulators, yet it can still maximize the quality of data reported to the registry. Part of the cost savings comes from the fact that not all reports are verified to the same degree or by a third party verifier. The rating process can be scaled to match the resources available for verification activities under each program and the goals of the program.[40] For example, a voluntary reporting program may rate no facility reports as high risk but many as zero or low risk. On the other hand, a RGGI project offset program may rate all reporters as medium or high risk to ensure credits are properly awarded. This approach also allows each State program to specify its own risk scaling.

We recommend that the risk rating process be automated to the maximum extent possible, although provisions should be made to allow the verification/certification body to modify any automated risk rating. The overall risk rating process could be contracted out to a private sector company, but extreme care would need to be taken to address current and future COI issues and the final determination would have to reside with government staff.

For facilities that already have existing air quality permits and are subject to compliance audits by state regulatory enforcement teams, these existing audit procedures may be able to be

[40] In other words, quotas on the number (or percentage) of verifications to be done for each risk rating can be set (i.e., the number of zero, low, medium, and high ratings) for each program so that public and private costs for verification are limited and the level of effort required is known in advance.

expanded to address greenhouse gas emissions within the facility's permit. If these existing enforcement teams are used, then the greenhouse gas review component should be based on regional rules and procedures to ensure comparability of data within RGGR across States. Even if existing enforcement teams are used, such as for the RGGI cap-and-trade program, they could be supplemented with an additional number of high or medium risk verifications.

Risk-based verification example from the European Union's Emission Trading System (EU-ETS)

Each EU Member State is currently in the process of designing or implementing their own verification/compliance system under the EU-ETS. The Netherlands plans to inspect all facilities at least once during the first phase (2005-2007) of the EU-ETS. Three to five percent of these inspections are scheduled to be more in-depth. Hungary's goal is to inspect 20 percent of its facilities each year. In the United Kingdom the goal is to inspect 5 percent of facilities each year. The remaining EU member states are divided between those that will follow a minimalist approach to inspections, those that will simply continue with their existing environmental inspection procedures, those that are not planning to conduct any inspections, and those that have not yet made decisions on this issue.

5.2.2 Verification steps

A generalized set of verification steps is summarized below. The specific steps followed for a particular reporter may differ according to the facility's risk rating and the program type being reported to.

Table 2: General verification steps

1. Close of calendar year	
2. Reporter collects data and prepares emissions report	
3. Reporter conducts internal quality review, including signed approval by management	
4. Submit signed report to regulator (including COI and dispute resolution agreement)	
5. Conduct initial automated review by regulator	
6. For complete reports, regulator prepares (partially automated) risk rating of all facility reports separately for each program	
7. Regulator for each program allocates reports into high, medium, low, and zero risk categories for verification.	
Zero and Low Risk	**Medium and High Risk**
	8. Tentative assigning of verifier to facilities
	9. Verifier submits case-specific COI statement
	10. Determination of case-specific COI by committee
	11. Final assignment of verifier to facilities
	12. Signing of appropriate COI and confidentiality/nondisclosure forms
13. Verification/certification body conducts basic desk review	13. 3rd party verifier conducts verification (if high risk, also conducts field audit)
	14. Monitoring of emerging COI
	15. Verifier submits verification statement to reporter
	16. Reporter reviews verification statement
	17. Reporter makes corrections to emissions report, if necessary and time permits
	18. Reporter provides response to verification statement to verifier, and if appropriate corrected emissions report
	19. Verifier revises verification statement, if appropriate
	20. Verifier submits verification statement to regulator, with copy to reporter. Reporter submits revised emissions report to regulator, if necessary.
	21. If verification statement is disputed, then process diverted to dispute resolution committee before going to regulator for registration
	22. Verifier provides feedback to regulator on process
23. Regulator makes determination of compliance/certification based on verification statement and reporter's final submission	
24. If compliance/certification determination is disputed, then process diverted to dispute resolution committee	
25. Reporter provides feedback to regulator on verifier and entire process	

The step in the verification process related to conducting the actual verification of the reporter's emission report (i.e., step 13 above) should include procedures for examining some or all of the following elements:

- Internal data quality control plans, procedures, and results
- Record keeping procedures
- Metering and monitoring processes
- Baseline determinations for offset projects

- Leakage monitoring processes for offset projects
- Conformity with program rules and guidelines
- Whether appropriate program administrator notification steps were taken
- Appropriate methodologies, algorithms, and calculations were used to estimate emissions
- Original production records, fuel receipts, material purchases, and other activity data
- Process information, equipment counts, and operational details
- The emission inventory results and emissions report
- The ability of the reporter to prevent and detect a material misstatement
- Other physical, documentary, and testimonial evidence collected during desk reviews and/or field audits

This paper does not discuss the detailed procedures that should be followed for the verification process at each risk rating level. It is expected that the elaboration of specific verification procedures can be based on existing verification guidance materials (see Reference section below). In large part, though, the elaboration of monitoring and reporting protocols for each industry sector included under each program and the structure of liability rules for verifiers will determine the verification procedures required.

Alternative formulations of verifier assignment and/or selection

A variation on the formulation of the verification system involves giving facility reporters the option to select their own verifier from the regional pool of accredited verifiers. This formulation, however, would require a more thorough case-specific COI evaluation and potentially limits on consecutive verifications by the same verifier.[41] Facility reporters should still have the option of having a verifier assigned to them.

Another variation would permit one verifier to verify all of a company's facilities in hope of gaining some economies of scale. (Depending on the design of the system, this verifier could be assigned by the verification/certification body or selected by the reporter.) This formulation, however, would require a more thorough case-specific COI evaluation and clear rules on how to handle jointly-owned (or other joint arrangements) facilities so that verification activities were not being duplicated or leading to disputes between companies.

These variations might be accompanied by modifications to the fee-based funding structure described above. Reporters that select their own verifier could be allowed to negotiate their own price with the verifier instead of paying the full verification fee. (Reporters should still pay a reduced verification fee to cover administrative costs.) A special fee-structure may also be considered for cases where one verifier handles all of a company's facilities. Under all of these variations, reporters should be required to pay a higher COI fee to cover the costs of the more thorough evaluation.

[41] CCAR has limits on how many consecutive years a verifier can verify a company's submission, which could be used as a model for voluntary reporting programs supported by RGGR.

5.2.3 Conflict of Interest (COI)

A verifier's areas of potential COI include organizational, case-specific, personal, and emerging COI. The overall COI evaluation process should consider all business relationships, including those of parent companies and partners. The accreditation process for verifiers should include an initial screening of a verifier's potential for organizational COI and the verifier's ability to identify and mitigate any potential organizational and personal COI issues. Once a verifier has been tentatively assigned to a reporter, a case-specific COI evaluation should be made.[42] And finally, during and after the verification process the verifier should be required to monitor emerging COI issues and notify the regulator if any such issues arise. Part of a verifier's accreditation agreement must be to notify the regulator immediately upon identification of a potential COI issue. A COI evaluation committee will likely be required to make COI determinations.

One potential problem with assigning a verifier to a facility reporter is that verifiers will not know, before they are assigned facilities to verify, what companies they can ethically perform other consulting work for without incurring COI issues with their verification activities. Assuming the pool of accredited verifiers is large enough and the initial screening of organization COI is adequate and up-to-date, this situation can be avoided in the assigning process and should not present a real problem for the administration of the verification system.

The verification process will require the development of detailed COI rules, procedures, and forms. The following are potential references for the development of RGGR/RGGI COI model rules:

- U.S. Environmental Protection Agency (EPA) COI model
- The UNFCCC Clean Development Mechanism(CDM) COI rules for Designated Operational Entities (DOEs)
- U.S. Securities and Exchange Commission (SEC) rules
- International Standard Organization (ISO) Guide 66
- California Energy Commission and California Climate Action Registry (CEC/CCAR) COI policy
- European Union's Emission Trading System (EU ETS) COI rules

We recommend that COI rules, initially, be developed using the CEC/CCAR COI policy as a model.

5.2.4 Material discrepancy and *de minimus* tests

One of the key issues in the process of verification is the determination of what is a material discrepancy (i.e., material misstatement). In general, materiality is a function of both quantitative and qualitative (e.g., lack of adequate systems or documentation) factors. The more objective and unambiguous the regulator can make the requirements for compliance with a program, the less difficultly there will be with determining what is material. A good example of

[42] Instead of reviewing all case-specific statements from verifiers, the regulator may only need verifiers perform their own evaluation and then sign a COI statement. The COI evaluation committee could then simply randomly sample some number of verifier statements for review and provide and adequate deterrent to COI or negligence. This approach would require some type of sanction for misstatements by the verifier.

this principle is the level of regulatory and technical detail in the U.S. Acid Rain Program for SO_2 and NO_x trading.[43]

The use of a *de minimus* for the purpose of reporting can add additional burden to the verification process because the verifier must determine whether the *de minimus* decisions made by the reporter were valid. Yet, it may be difficult for verifiers to make this determination because reporters' may have used a *de minimus* to justify the failure to collect data. This additional burden on the verification process can be minimized or avoided altogether by designing the reporting and verification system around facility-level data. In the elaboration of reporting rules and definitions of a facility for each industry sector and/or activity, the regulator can specify *de minimus* facility sizes in terms of common metrics (sq. feet, MWh of generation, tons of product produced per year, etc.) under which reporting is not required by the program (for mandatory programs). The use of a percentage *de minimus* with corporate-level reporting is inherently problematic to verify and renders verification opinions less credible.

Definition of Materiality from the European Community

'Materiality' is the professional judgment of the verifier as to whether an individual or aggregation of omissions, misrepresentations or errors that affects the information reported for an installation will reasonably influence the intended users decisions. As a broad guide, a verifier will tend to class a misstatement in the total emissions figure as being material if it leads to aggregate omissions, misrepresentations or errors in the total emissions figure being greater than 5 percent;" However, the level of materiality has to be established by the verifier in a case by case manner. Under many circumstances a level of misstatement above 1% of annual emissions of an installation can qualify as material.

5.2.5 Dispute resolution

A critical part of designing a verification system is a detailed elaboration of rules to deal with disputes. Disputes may occur between all three parties: reporters, verifiers, and regulators. These disputes may involve, among any number of issues, COI determinations, accreditation, or certification of emissions reports. All parties should agree from the beginning to first attempt to resolve their disputes amongst themselves, and then, if necessary, abide by a dispute resolution process. Reporters and verifiers should be required to sign standardized agreements at the submission and accreditation stage, respectively.

The rules for the creation and operation of a dispute resolution committee should be established before the programs are launched. The composition of a dispute resolution committee should include unbiased and respected individuals that are independent of all three parties.[44]

5.3 Data handling and Documentation

The fundamental product of RGGR is information. Therefore, the design of the data handling and documentation rules and procedures for the verification system is critical to its long-term success. One of the primary products of the verification system will be a verification statement

[43] See CFR 40, Part 75 at www.epa.gov/airmarkets/monitoring

[44] A dispute resolution committee and process has been established by CCAR, and could prove a useful model.

for those facilities undergoing 3rd party verification.[45] Verifiers and regulators will also need to have access to all of a reporter's data, whether or not that data is confidential or sensitive. Therefore, the verification system must include comprehensive rules and agreements addressing the protection of confidential business information (CBI) and the disclosure of information gathered during the verification process. These rules and agreements should ensure that the public, the media, and interested stakeholders (e.g., environmental NGOs) have sufficient access to information so that they can serve their important "watchdog" function.[46] Lastly, the usefulness of the information in RGGR in the future will, in large part, depend upon record keeping and retention requirements.

In order to maximize the efficiency of the entire reporting and verification system, highly standardized forms and templates for all contracts, agreements and submissions should be developed, including forms for the verification statement, acceptance of verification opinion by the reporter, and confidentiality/nondisclosure agreements.

5.3.1 Verification statement

The verification statement is the primary document produced by a verification process involving a 3rd party verifier. The typical elements of a verification statement include, but are not limited to, information on the following:

- Descriptive and identifying information on facility and reporter
- Date of and location of verification and field audit, if applicable
- Names of verification team members and lead verifier
- Accreditation confirmation
- A signed COI form from the verifier
- A signed confidentiality/nondisclosure form
- A discussion of the effects of CBI designations on the verification process
- A description of the scope and limitations of the verification procedures completed
- A signed statement by the verifier attesting to the fact that the verification procedures were in keeping with the relevant program's requirements
- A summary of the findings from the verification procedures completed
- A signed verification opinion, including any qualifications
- An explanation of each of the qualifications included in verification opinion, including the expected effect of the qualification on the quality of the inventory report
- A declaration on the eligibility of the reporter to participate in the program

We also recommend that the verification statement include suggestions from the verifier on measures the reporter can take to correct errors or otherwise improve his/her emissions report.[47]

[45] The regulator's verification/compliance body may also produce a simplified verification-type statement following their review of low and zero risk facility reports.

[46] When data is made publicly available, this watchdog function can be a powerful complement to the verification process by ensuring that corporations properly take responsibility for the facilities they own or operate under a program and, where enforcement sanctions are weak or nonexistent, by publicly 'shaming' companies for false or inaccurate reporting.

[47] The inclusion of improvement suggestions in the verification statement should not create a COI.

In order to expedite the verification process, verifiers should be supplied with standard verification statement forms, preferably ones they can submit electronically. Examples of verification statement forms or suggestions for the content of forms are available from CCAR, the EU ETS Member States, and in the ISO 14064 Part 3 standard.

Each verification statement must also contain a verification opinion. The table below summarizes the typical types of verification opinions.

Table 3: Types of verification opinions for verification statements

Type of Verification Opinion	Interpretation
Unqualified opinion with no exceptions.	The verifier is satisfied, without significant caveats or reservations, that there are no material discrepancies in the annual emissions report and that monitoring has been carried out in accordance with requirements.
Unqualified opinion with exceptions.	The verifier considers that there are some inconsistencies with the reporting or monitoring requirements or the reporting principles that should be addressed by the reporter. The inconsistencies, however, have not caused a material discrepancy, and therefore the annual emissions data can be verified. For example, a lack of transparency may hamper the verification process, but with greater effort, the verifier may still be able to determine the emissions within adequate materiality thresholds.
Qualified opinion	The verifier considers that there may be material discrepancies in the data or inconsistencies with monitoring or reporting requirements that may lead to a material misstatement. However, a verification opinion can still be issued. For example, the data used to estimate emissions is reasonably accurate, but the reporter has not used the required monitoring approach or obtained approval for use of a different approach from the regulator. Other examples include inability to access information or uncorrected estimation errors.
Not verified	The verifier considers that there are material discrepancies or misstatements in the data and the emissions report that have not been corrected or amended. No verification opinion has been issued since the data is not satisfactory. This situation should be avoided wherever possible, though good communication between the verifier and the reporter and the timely correction of errors.

In designing a verification system, program administrators will need to decide whether they will require a positive or negative verification statement for each program. The level of assurance provided by a positive verification statement is greater than for a negative statement (see box below). A requirement for a positive verification statement also has significant implications for the application of liability agreements, should a dispute arise. We do not have specific recommendations for the use of positive or negative verification statements with a particular program, as the decision will depend on the goals for the program.

Examples of positive and negative verification statements

Positive
"The greenhouse gas emissions report is free from material misstatements."
"I have reasonable assurance that the emissions report is free of material misstatements."

Negative
"Nothing has been identified indicating that the report includes any material misstatements."
"Nothing has come to our attention that causes us to believe that the report is not, in all material respects, in accordance with requirements."

5.3.2 Confidentiality and non-disclosure agreements

Program administrators will need to develop procedures and rules to deal with confidential business information (CBI). These rules and procedures will need to address:

- What types of information it is acceptable for reporters to claim is CBI
- The process for filing a CBI claim by a reporter
- The evaluation of claims of confidentiality from reporters, including a dispute resolution process
- The handling and protecting of CBI by regulators
- Access to CBI by verifiers
- The handling and protection of CBI by verifiers
- The archiving of CBI
- A process for "watchdog" groups and other interested parties to dispute CBI claims

The rules determining what type of information reporters can claim as CBI must balance the protection of a company's competitiveness with that of the public's right-to-know. This balance will likely differ by program type. In general, we recommend that reporters be required to specifically designate information as confidential and provide a justification for that designation. Further, the blanket designation of information or data should not be permitted. Each justification should correspond to individual datasets or documents.

It will also be necessary to decide whether the verification statement is to be treated as confidential or will be publicly available. Information designated as CBI could be redacted from the verification statement so that it can be publicly released. Alternatively, the verification opinion could be released while keeping the full verification statement confidential. In order to maximize the credibility of a reporting program—and to be consistent with the standards set by the Clean Air Act—we recommend that program administrators make emissions-related data and the full verification statement publicly available and establish a high threshold for claims of CBI.

Program administrators should, for the most part, be able to rely on CBI rules and procedures already in use by State environmental regulators.

5.3.3 Record keeping and retention

Mandatory record keeping and retention requirements should be established for all program types. Although reporters and verifiers cannot be expected to maintain records indefinitely, they

should be required to keep them for an amount of time corresponding to the point in time a plausible policy or regulation in the future might utilize them.[48] Thorough record keeping and retention is especially important for reporting programs—versus RGGI programs—because much of their value lies in the potential use of the registry data in the in the future. These record keeping and retention requirements should address all three parties—the regulator, reporter, and verifier. We recommend that records be retained for at least 10 years, although this requirement should be reevaluated at roughly 5 years after the start of each program.

The regulator should archive copies of all emission reports and verification statements. Verifiers and/or reporters should also retain records of all background material gathered during the verification process, such as:

- Records demonstrating conformity with the verification requirements
- Copies of important legal documents, agreements, meeting minutes
- Documentation of the verification planning process
- Records on how materiality was determined
- Results of any data analyses conducted
- A record of verification procedures conducted and results

In addition to the elaboration of specific record keeping and retention requirements, reporters should be reminded that failure to adequately maintain records—whether or not they are currently designated as CBI—could adversely impact their ability to receive regulatory recognition in a future market-based or other regulatory program.

6 Program-specific verification issues and recommendations

The previous section discussed and provided recommendations on a series of general verification issues. These recommendations were, for the most part, addressed all program types that are envisioned to potentially use the registry. However, each program type also has distinctive verification issues. We briefly provide recommendations on these program-specific verification issues in this section.

Our recommendations for the design of the reporting system and verification system are constant across all program types (i.e., that reporting and verification should be at the facility level). We also recommend that a single accreditation process, including the initial organizational COI evaluation, be developed for all program types. The resulting pool of accredited verifiers would then be available to supply all programs. Similarly, the verification approach corresponding to each risk rating should be the same for all program types. Variation in the rigor of verification activities for each program type should be addressed through the selective rating of facilities in each program (i.e., a facility reporting under a voluntary program could be more likely to receive a low or zero risk rating than the same facility if was reporting under a mandatory program).

[48] The United Kingdom's rules for the implementation of the EU ETS require that records be maintained by the verifier for 10 years. Under the CCAR, the California Energy Commission recommends that records be maintained for 7 years. The Massachusetts CO_2 emission standards for power plants require records to be maintained for 5 years.

Our recommendations addressing other verification issues, however, vary across program types and are based on our assumptions of the likely goals of each program type. For example, we assume that voluntary reporting programs will serve a variety of goals, including:

- Encouraging voluntary GHG emission reductions
- Allowing registrants to learn and build institutional capacity
- Enable public disclosure of greenhouse emissions information
- Facilitate voluntary markets for greenhouse emissions and emission reductions
- Prepare participants for participation in future regulated emission markets
- Provide policy makers with insights on greenhouse gas emission trends

Mandatory reporting programs will likely have similar goals, but may place more emphasis on preparing reporters for future mandatory emission markets or other regulations.

In order to encourage broader participation, administrators of voluntary reporting programs may decide to allow reporters to register emissions without having their submissions verified in any way.[49] However, we recommend that all emission reports submitted to all program types be processed through the verification system. If policy makers insist on accepting submissions of unverified reports, then we recommend that a separate classification in the registry be created for unverified reports.[50]

Additional verification procedures for the facilities in the RGGI cap-and-trade program may be unnecessary, as the program can rely on the existing facility permitting and U.S. Acid Rain Program compliance enforcement measures. We recommend, however, that additional reporting and verification procedures are required for RGGI facilities. These additional procedures are warranted because while the U.S. Acid Rain Program collects and reviews CO_2 data from combustion units, the focus of the Acid Rain Program is on ensuring the accuracy of SO_2 and NO_x emissions data, not CO_2 data. Facilities in the RGGI cap and cap-and-trade program should be required to submit an annual greenhouse gas emissions report. This report should then be subject to the risk-based rating described above for determining the verification approach to apply. Most RGGI facilities may be classified as zero risk, with only a small number classified as medium or high risk each year.

If the RGGI cap-and-trade program is expanded to non-Acid Rain Program facilities then we recommend the full verification system, as described in this paper, be applied.

The verification of both RGGI and voluntary offset projects presents an additional set of issues. The verification of project-level emission reductions (or removal enhancements) requires that both the actual project emissions and baseline determination be verified. Depending on the project, this verification may also include review of leakage estimates. Although RGGI is focused on only allowing projects from a pre-approved list of project types, there may still be a need for some type of official *ex ante* validation of projects to provide assurance to project developers and investors that their proposed project meets all the program's requirements (e.g.,

[49] This is the argument used by DOE in their draft proposal for the revised 1605(b) program. We recommend against any program supported by RGGR taking such an approach.

[50] These reports could include those that failed to be certified due to an unsatisfactory verification opinion.

passes other additionality and leakage tests). Some States may also wish to allow the voluntary registration of offset projects. A voluntary offset project program could allow program administrators to learn enough to add to the list of RGGI pre-approved project types in the future.

Table 4 summarizes our program-specific recommendations for each of the verification issues that vary by program type.

Table 4: Program-specific recommendations on verification issues

Program type Verification issue	Voluntary reporting	Mandatory reporting	RGGI cap and trade	RGGI project offsets	RGGI expansion	Voluntary project reporting
Reporting entity for registry records	Facilities, with additional fields for corporate control and/or share. Allow out of region facilities.	Facilities, with additional fields for corporate control and/or share. Allow out of region facilities.	Facilities and combustion units as specified in the U.S. Acid Rain Program	Project developers	Facilities (specific definitions yet to be determined)	Project developers
Accreditation process	As described in paper	As described in paper	As described in paper, plus rely on existing Acid Rain Program compliance audits	As described in paper, plus requirements for additionality and leakage	As described in paper	As described in paper, plus requirements for additionality and leakage
Verification approach and scaling of risk ratings	Quotas weighted towards zero and low risk ratings	Quotas weighted towards low and medium risk ratings	Utilize medium & high risk verification processes to supplement Acid Rain Program compliance audits	Quotas strongly weighted towards high risk ratings and include additional procedures for projects	Quotas weighted towards high risk ratings	Quotas weighted towards medium risk ratings and include additional procedures for projects
Suggested liability limits for verifiers	Replacement or replacement & staff time	Replacement or replacement & staff time	Replacement plus penalties[51]	Replacement plus value of excess credits	Replacement plus penalties	Replacement or replacement & staff time
Case-specific COI determination	Minimal review by committee	Minimal review by committee	Thorough review by committee	Thorough review by committee	Thorough review by committee	Minimal review by committee
Fee structure	As described in paper	As described in paper	If required, as described in paper	As described in paper, with validation and higher verification fee	As described in paper	As described in paper, with validation and higher verification fee

[51] If 3rd party verifiers are employed, in addition to government compliance enforcement teams.

Program type Verification issue	Voluntary reporting	Mandatory reporting	RGGI cap and trade	RGGI project offsets	RGGI opt-in facilities	Voluntary project reporting
Record keeping and retention	As described in paper	As described in paper	As described in paper, plus rely on existing Acid Rain Program requirements	As described in paper, with additional baseline requirements	As described in paper	As described in paper, with additional baseline requirements
Material discrepancy threshold	To be determined	To be determined	Based on U.S. Acid Rain Program requirements	To be determined	To be determined	To be determined
Requirements for verification statement[52]	Same for all program types	Same for all program types	Same for all program types	Same for all program types, plus additional requirements for baselines	Same for all program types	Same for all program types, plus additional requirements for baselines
Verification opinion[53]	Negative statement	Negative statement	Positive statement	Positive statement	Positive statement	Negative statement
CBI designations	To be determined	To be determined	Based on U.S. Acid Rain Program requirements	To be determined	Based on U.S. Acid Rain Program requirements	To be determined

[52] The detail of verification statements are a function of the risk rating (i.e., the verification approach).

[53] The type of statement is only a suggestion, and should be set based on the specifics of each program.

7 Next steps

This section provides an unprioritized "laundry list" of tasks we recommend as next steps to fully develop the verification system for mandatory, voluntary, and RGGI programs supported by RGGR. Completion of many of these tasks will require engagement and decisions by RGGR and RGGI policy makers (i.e., the States).

- Obtain counsel on legal issues with proposed reporting and verification system design
- Elaborate definitions of facility and unit, especially for non-stationary combustion units[54]
- Identify specific duties and staffing for various administrative bodies, including:
  - Dispute resolution committee
  - Accreditation board
  - Verification/certification body
  - COI evaluation committee
- Elaborate liability and enforcement rules[55]
- Elaborate accreditation requirements
- Develop accreditation training course training course and exam
- Elaborate specific grounds for disqualification of verifiers
- Elaborate dispute resolution process and rules
- Determine fee amounts, billing process
- Elaborate more specific verification procedures for each risk rating process based on industry or source-specific monitoring and reporting protocols
- Determine long-term requirements for monitoring and reporting on emerging COI
- Elaborate guidance for preparing verification statement and conducting verification
- Determine record keeping and retention rules
- Develop standardized documents or forms for the following:
  - Submission for initial COI screen
  - Dispute resolution process agreement form
  - Verification statement (for each risk ranking level)
  - Accreditation application
  - Confidentiality/nondisclosure agreement forms
  - Intent to comply with COI requirements form for verifier
  - Form for reporter to accept verification statement
  - CBI submission form
  - Agreement forms on verification process for reporter (e.g., agreeing to provide access to verifier and regulator to necessary reporting information)

Several approaches to verification are currently in use by existing voluntary and mandatory emissions registry and trading programs. The decisions and procedures needed to address the list of items above could be further informed and hastened by a more thorough examination of other

[54] We have been told that this process was quite difficult and legally complicated for the EU ETS.

[55] This is likely to be a key issue for the design of the overall verification system.

programs' verification systems than was possible here with the resources available. These other programs include:[56]

- Existing State reporting programs: New Hampshire, Wisconsin, Maine, and California
- U.S. EPA Acid Rain Program
- Chicago Climate Exchange
- EU Emissions Trading System
- UK Emissions Trading System
- Canada's Final Large Emitters, TEAM, SMART, VCR, CleanAir Canada, Ontario Emissions Trading Registry, and Quebec-Ecogeste Registry programs
- New South Wales Greenhouse Gas Abatement Scheme
- ISO 14064 Part 3 verification standard
- IETA VVM
- DOE/EIA 1605(b) (existing and planned)
- Australian Greenhouse Gas Challenge
- U.S. EPA Climate Leaders

[56] Due to funding limitations, we were unable to conduct a full review of each program's verification system.

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ERT is a not-for-profit organization that pioneers the use of market forces to protect and improve the global environment. Founded in 1996, ERT has expertise of market mechanisms, such as emissions trading, to address the challenges of climate change, securing clean and reliable power, and encouraging environmentally beneficial land use. In addition, ERT does third-party verification of GHG emission offsets and operates the EcoRegistry® Program that monitors, verifies, and reports both emissions and high-quality emission reductions.

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