How to Report:
Possible Resources for Participation and Administration

The question of "how" to report to a GHG emissions registry can be divided into two basic categories: 1) resources for participants and 2) resources for registry administrators. Participants will need tools that allow them to identify, calculate, and then report their emissions. A number of tools already exist to identify, track and calculate GHG emissions and reductions. GHG Registry Administrators will need a database that easily interfaces with participant's reporting tools and manages and organizes the information according to the goals of the program. . The difficult task for a state is developing a registry database that can accommodate the tools that participants use as seamlessly as possible, thus making it easier to register.

One critical factor in designing the database and reporting system will be state resources: many of the ideas discussed below may simply be too expensive for individual states. Direct collaboration among the states may help to overcome this obstacle. Since several states must develop a database and reporting system, it makes sense for the states to collaborate and create one product that each could separately use. A common database product should be easily modified to reflect the different rules that states may have. However, this would need to be explored further.

The rest of this paper discusses the different tools that participants can use. It then looks at different ways that a state can develop its database and reporting system.

Resources for Participants

Since states are unlikely to have the staff and time to develop their own reporting guidance and tools, they will have to rely on other, readily available resources. Due to the heterogeneity of participants' activities and interests, states should offer as many resources as possible. Some participants, such as small businesses and organizations, have few sources of emissions and will only require simple emissions calculation tools, such as spreadsheets. These resources are described in the section "Emissions Calculation Tools." Other participants may need more sophisticated tools that allow them to manage a large number of GHG emission sources. These resources are discussed in "Corporate Planning Tools."

Emission Calculation Tools

There are several resources for registry participants whom may only require tools to take energy and activity information and calculate the corresponding GHG emissions. The world wide web has numerous "carbon calculators" that can be used for simple analysis. Many of these can be accessed through EPA's global warming page: Web Calculators.

For more detailed analyses, a number of organizations have developed guidance documents and spreadsheets to assist entities in calculating their emissions:

GHG Protocol

The GHG Protocol is a collaborative project of the World Resources Institute and the World Business Council for Sustainable Development. The project is developing three related modules to provide guidance on measuring and reporting greenhouse gases from a company's core

operations, product life cycle and sequestration. GHG estimation tools in the form of excel spreadsheets are available on the collaboration's web site at http://www.ghgprotocol.org/index.htm.

EIA's Voluntary Reporting Program 1605(b)
The 1605(b) program has extensive guidance and software resources for calculating emissions and emission reductions. General guidance, project specific guidance, emission factors, and Excel worksheets are available at the program web site at http://www.eia.doe.gov/oiaf/1605/techassist.html.

EPA's Climate Leaders Program
Climate Leaders is a unique government-industry partnership sponsored by the U.S. Environmental Protection Agency (EPA). The program is currently developing sector specific spreadsheets to assist its participants calculate their GHG emissions.

Corporate Planning Tools
Participants, particularly larger corporations, may require more sophisticated carbon management tools. These help to organize sources of emissions and calculate emissions and reductions over time. Many have features that would allow them to easily incorporate registry rules into the software, making it easier for companies to participate.

Torrie Smith Associates Inc.
Torrie Smith Associates Inc. is the developer of Greenhouse Gas Emissions Software products for corporations, regional, state and local governments. They provided the International Council for Local Environmental Initiatives (ICLEI) with the first easy to use software for local governments to quantify greenhouse gases emissions from their activities. Their proprietary Greenhouse Gas Emissions Software has helped over 140 municipalities in Canada, the United States and Australia analyze energy and greenhouse gas emissions and plan technical and policy measures to reduce emissions in their communities. A free demo of their software can be downloaded from their web site at http://torriesmith.com/.

GHG Spaces
GHG Spaces has developed its first greenhouse gas control solution, ghg smart™. It is an Inventory Accounting Package, a GHG Credits Project Management Tool, a Compliance Report Generator, and an internal GHG Analysis and Planning vehicle. If you would like to receive login information required to access the ghg smart™ demo, please visit the GHG Spaces Contact Page on their web site at http://ghgspaces.com/.

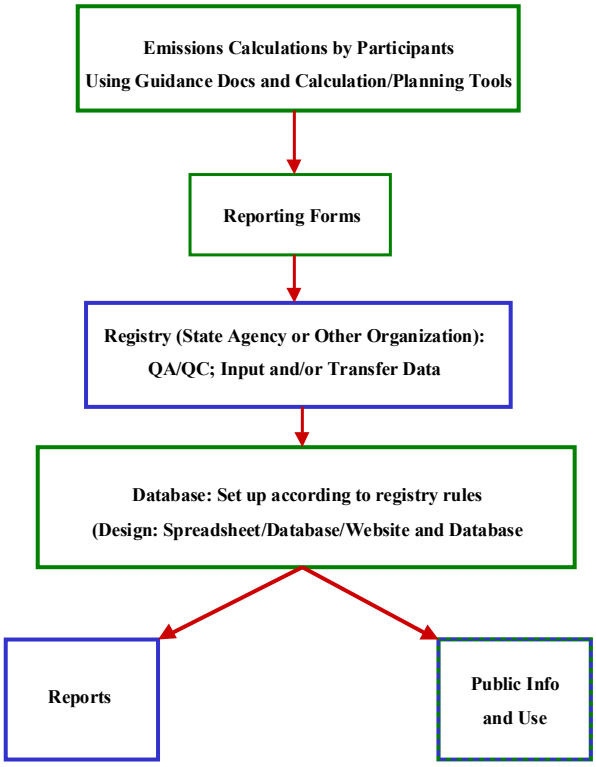
GHG Registry (Environmental Resources Trust)
Founded in 1996 with help from the Environmental Defense Fund, ERT is a non-profit organization. ERT focuses on implementation not advocacy. ERT's goal is to harness the power of markets to meet environmental aspirations. The Greenhouse Gas Registry is designed to enable the reporting and tracking of greenhouse gas emissions by voluntarily reporting companies. For more information see ERT's web site at http://www.ecoregistry.org/.

Greenware Environmental Systems, Inc.
GreenWare software allows companies to create, customize and link a wide range of financial, environmental and knowledge-based applications-valuable electronic features that are not available in a manual process. These products also assist companies in the complete analysis, improvement, presentation and disclosure of their environmental performance to their stakeholders. Among other software tools, the company has Greenhouse Gas Software. All data can be updated in real time and normalized for comparison purposes across any level of a company. The software is also intended to be compatible with the GHG Protocol Initiative spearheaded by the World Resources Institute and the World Business Council for Sustainable Development. Please click here to see information about a demonstration of the software.

Administrative Resources

Once participants have tools to generate emissions data, states need to have an apparatus in place for receiving, storing, managing, and reporting out the data. Figure 1 depicts the basic structure for a registry apparatus (green boxes indicate products that need to be developed or co-opted and blue boxes indicate administrative burdens). States will need to decide on how participants will report into the system and what the database will look like. These two questions are closely related. If the state wants to keep the system very simple (but potentially time intensive for those running the registry), they can create paper forms and store the information in a spreadsheet. Conversely, if the state wants to have a more robust system that minimizes administrative burdens, they could have electronic or direct internet reporting into an internet accessible database. These choices will depend mostly on state resources. The former is cheap up front, but costly over time due to the costs of staffing a labor intensive system. The latter would be expensive up front, but likely to be much cheaper and easier to run over time.

Figure 1: Basic Registry Reporting Structure

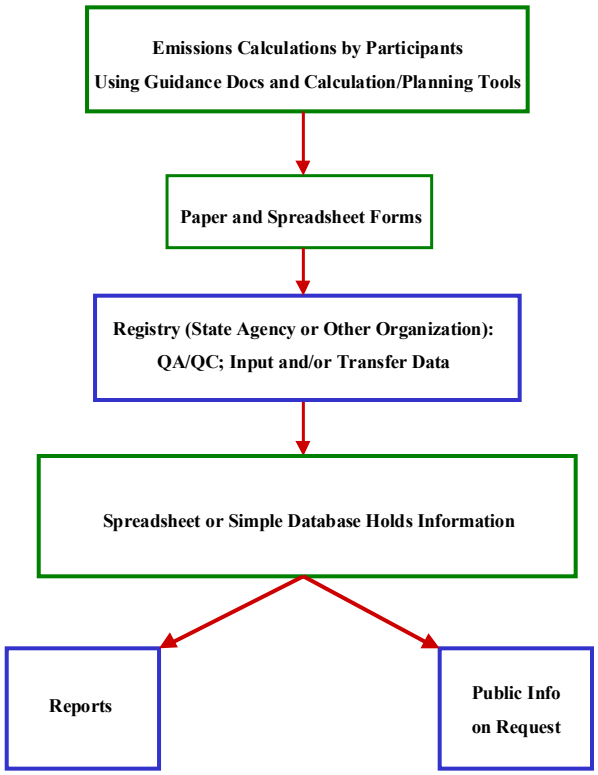


Reporting Forms and Interfaces

The question of how participants report into the registry should be focused on simplicity and efficiency for both the participant and the registry administrator. Perhaps the simplest way to report is through paper or electronic forms. These would be sent to those administering the registry, who would check them to ensure that all the rules have been followed and that the data is correct. Then this information would be loaded into the registry database. The obvious reporting disadvantage of paper forms is that the state would need to manually enter all the data, which would be time consuming and expensive, particularly if the program is successful in attracting broad participation. Electronic forms could eliminate this, as long as they are directly integrated with

the database. For example, if the reporting forms are Excel spreadsheets, then these could easily be integrated into a larger Excel spreadsheet program or a database program that is compatible with Excel (such as Access). Such a system would be both simple for the users and efficient for the administrators. It is shown in Figure 2.

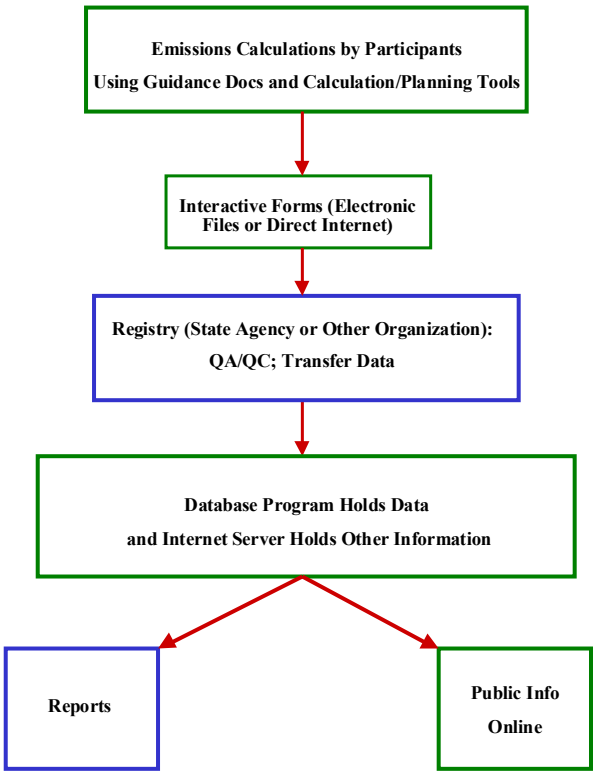
Figure 2: Simple Structure



To make reporting even simpler, states may want to build direct interfaces with some of the emission calculation spreadsheets and software programs. This could be done by designing a more complex database that will directly accommodate some of the tools. It could also be done by encouraging those who develop tools to modify their spreadsheets or programs to interface directly with the registry. Private software companies will likely be willing to directly collaborate with database developers to generate these interfaces, since it will increase the value of their product. Many of the spreadsheets, however, are designed for specific, and usually not proprietary, purposes. Thus, it may be harder to get these modified and the database may need to be designed to incorporate these as they are.

Finally, states could allow participants to report directly into the database via the internet. This could work by having an internet form for all the information. Participants would set up an account, fill out the forms and then update the information. The administrators could then QA/QC the information without the added step of transferring the information into the database, which simplifies the system for all involved. Direct interfaces and internet reporting are reflected in Figure 3.

Figure 3: Robust Structure



<u>Designing the Database</u>

The choice of reporting mechanism and the choice of the database are closely linked.

The advantage of using something simple, like a spreadsheet for the database is that it is cheap and easy. The downside is that these are cumbersome vehicles for storing, querying, and reporting data, which is a burden to the administrators but also makes it difficult to respond to public requests for information. Spreadsheets are also poor storage devices for qualitative information, such as explanations of specific projects or situations (such as ownership concerns or baseline modifications) and lessons learned, which would provide an easy way to share case studies. Essentially, as a state increases the required or allowed information, it will need for a more sophisticated database system.

Sophisticated databases have clear downsides: they require time and money to develop and maintain. But they have numerous advantages. They overcome the basic deficiencies of using spreadsheets and would make the registry much easier to manage over time. They can be programmed to allow for more options in terms of linking emissions calculation tools directly to the database. They may also allow for greater latitude in reporting qualitative information.

Setting up the database on an internet server would further increase the reporting ease and options. It would eliminate the need to send files back and forth, be easily accessible to participants, and make it easy to report the non-confidential information to the public. It would also allow for more qualitative information, since the data could go into a classic database (like Access) and the qualitative information, like case studies and explanations could go into a user's account as separate documents and be easily referenced.