A Common-Sense Approach to Information Management for Corporate Greenhouse Gas Inventory

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Abstract

Industry representatives and greenhouse gas (GHG) registry managers identify data collecting and reporting as one of the single largest barriers to companies' participation in voluntary emissions reporting. Even companies that have tracked GHG emissions for many years find the increasing rigor of GHG reporting burdensome. Guidance documents on GHG inventories and reporting provide extensive detail on the scope and rationale of reporting. However, there remains a void in defining the best approaches to managing information for GHG inventories and reports.

With a multitude of software options and potentially large data sets, GHG inventories and reports can be intimidating and is perceived as potentially time-consuming and costly. However, the application of a Common-Sense Approach to GHG information management allows GHG managers to demonstrate a Return on Investment by outlining benefits and costs as well as showing the connection between the functionality of a solution and specific business requirements. While not elaborate, this approach focuses on the introduction of a disciplined thought process and is designed to identify information management tools that make companies more efficient, comprehensive, and accurate in their calculation of a GHG inventory. This Approach is valuable to managers and decision makers regardless of whether companies have been tracking a GHG inventory.

Introduction

In response to various issues reflective of the business environment today, more companies are undertaking an inventory of their GHG emissions. Three key drivers are prevalent. First, businesses may be responding to trends of socially-responsible investing. Investors now have access to resources including the Sustainability for Assets Management's (SAM) Dow Jones Sustainability Index, FTSE 4 Good, Innovest, and the Investor Network on Climate Risk (INCR). Second, stakeholder groups are putting pressures on companies to be transparent about their environmental practices sometimes through shareholder initiatives[1,2]. These stakeholders include shareholders, community, and employees. Thirdly, and perhaps most importantly, companies undertake inventories and reports of GHGs to take advantage of cost savings associated with energy savings and emissions reductions, and to prepare their companies for future regulations and emissions credit trading[3].

The nature of the GHG inventory issue lends itself to having multiple interested parties. People involved in GHG management include GHG and energy managers, corporate senior business personnel, information technology personnel, and external stakeholders. GHG and energy managers value management tools that effectively collect the scope of

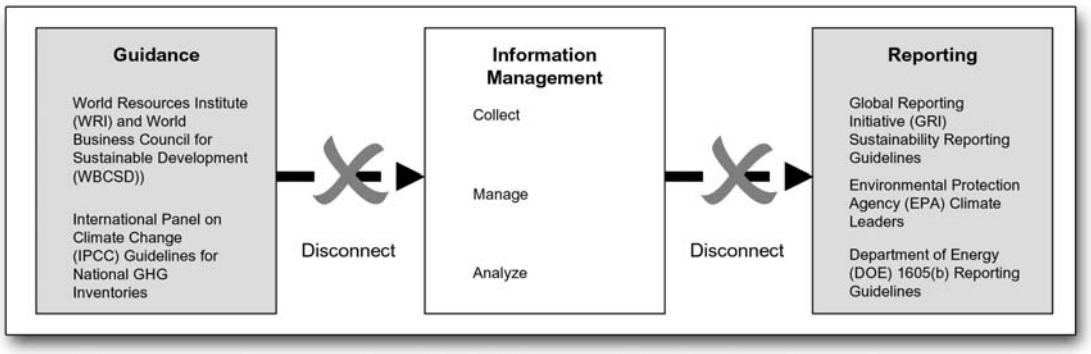
data and perform necessary analysis and reports. Senior business management are interested in Return on Investment and value of any information management tool. At the information technology level, corporate information technology managers are wary of software compatibility issues and utility of recent information technology investments. External stakeholders are interested in data transparency. The Common-Sense Approach addresses each group's interests and provides a mutual solution to the GHG management challenge.

The GHG Management Challenge

As corporate managers have turned their attention to GHG management, they have sought guidance from Non-Governmental Organizations (NGOs) and government programs. Extensively detailed and effective guidance are available for understanding the scope of GHG emissions and methodologies to calculate these emissions. Additionally, clear instructions are provided by GHG registries and voluntary programs for reporting in terms of level of detail and transparency required by participating companies.

However, there remains a void on strategies for managing GHG information. As a result industry representative and GHG registry managers identify data collecting and reporting to be one of the single largest barriers to companies' participation in voluntary emissions reporting. Figure 1 illustrates the disconnection between the GHG inventory guidance and necessary GHG data reporting for participation in registries and other voluntary programs. Information management guidance, such as the Common-Sense Approach, serves as a bridge between emissions inventory guidance and desired reporting output.

Figure 1. Disconnect between GHG inventory guidance and reporting. What is the guidance for Information Management?

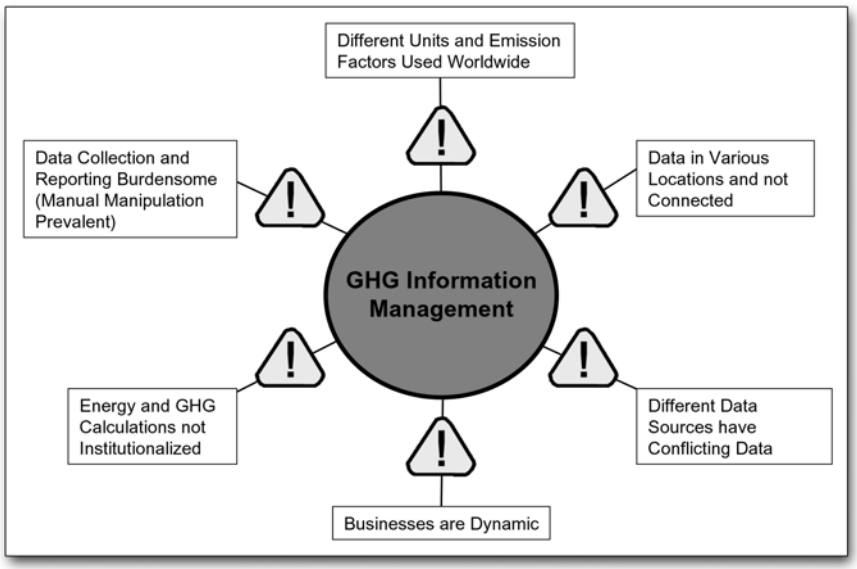


The burden for collecting, managing, and analyzing GHG inventory data can be attributed to several common challenges. Figure 2 illustrates some of the most common challenges to effective GHG information management. Collectively, these challenges combined with others can be intimidating and discourage companies from tracking GHG inventories.

However, there is a solution for filling the current information management gap. This solution is named the Common-Sense Approach and has been designed to:

- Consider the full scope of GHG Emissions
- Leverage existing information technology investments
- Maximize the Return on Investment
- Create data transparency
- Improve corporate reputation

Figure 2. Common challenges businesses face regarding GHG management



This paper describes the three Stages of the Common-Sense Approach used for GHG information management. Then the paper categorizes results by company type, based on companies' robustness of GHG management program. And concludes by demonstrating how the Common-Sense Approach reduces barriers for all companies regardless of how robust their system is for GHG inventory management.

Answering the Challenge

The Common-Sense Approach comprises three Stages:
(1) Business Needs Assessment,
(2) Technical Requirement Generation, and
(3) Identification of Information Management System.

This approach is designed to be applicable to all companies, regardless of the sophistication or history of information management tools already in place. The method employed for a Common-Sense Approach to GHG information management is similar to evaluations for any corporate information technology investment. However, the approach has been customized to address specific issues associated with managing a GHG inventory.

The Common-Sense Approach is derived from experience with voluntary government-sponsored GHG programs and direct work with corporate GHG energy managers. Its Stages are designed to: leverage existing information management investments, navigate through the universe of GHG management tools, maximize the ROI for any information management decision, and fulfill GHG analysis and reporting needs now and in the future.

Stage 1: Business Needs Assessment

For the purposes of this paper, ***Business Needs*** are defined as activities that would be supported by a GHG information management tool(s). These Business Needs serve as the foundation for the GHG information management strategy. A temptation in gathering business needs is to involve every potential user and inquire as to what their information management needs are for GHG inventories. The result is often an unfocused, unrealistic, and overwhelming list of requirements that more closely resemble business "wants" rather than business "needs."

To effectively collect business needs, Stage 1 of the Common-Sense Approach identifies three key points of view to ensure the assessment is focused and provides desired results (Figure 3); the first two organize and scope the business requirements. The third prioritizes personnel who will be the most important source of feedback.

Business Needs Assessment Highlight

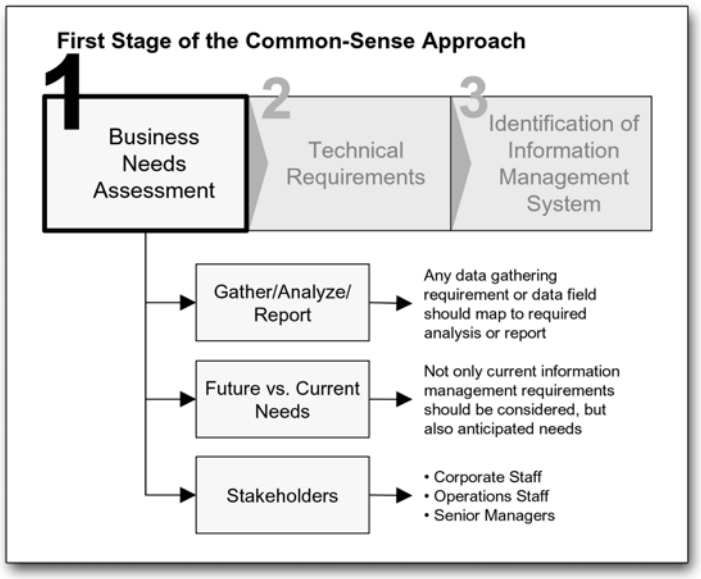
One important tip for collecting requirements is to start with required reports and analyses. Any data gathering requirement or data field should map to an analysis or report. If not, they are likely unnecessary and may create additional data collection burdens.

Gather/Analyze/Report. To limit the potentially exhaustive list of requirements, they should be organized into key processes. Three good categories of requirements to use are Data Gathering, Data Analysis, and Data Reporting Requirements. One important tip for collecting requirements is for any data gathering requirement or data field to map to a required analysis or report. If not, information gathered is likely to be unnecessary and may create additional data collection burdens. Another advantage of organizing requirements in the gather/analyze/report categories is that information technology solutions often mirror the gather/analyze/report categories, making it easier to evaluate potential solutions.

Future vs. Current Needs. GHG accounting and reporting has changed dramatically over the past few years and continues to evolve as GHG registries become more rigorous and new programs are implemented. Therefore, for an information management approach to be successful over even a five-year time horizon, a 'Business Needs Assessment' must investigate not only current information management requirements, but also seek information about predicted future data needs as well. Although these future needs may not directly translate into immediate requirements for an information management tool, any selected tool must be adaptable to accommodate future needs, maximize its useful lifetime, and maximize Return on Investment. For example, a company may not currently track commuter emissions, but may wish to collect that data in the future. These requirements should be documented to ensure that any solution can be easily expanded in the future to collect and manage this data.

Stakeholders. As many end users of the information management tool(s) as possible should be solicited for feedback on requirements. By incorporating many end users at the very beginning of the assessment, there is a much greater likelihood of user support and acceptance of the eventual solution over the longer term. It is important to learn the needs of headquarters or corporate staff that are most likely to use GHG data extensively for internal analyses. It is also necessary to learn the needs of those responsible for external reports such as to voluntary registries or corporate sustainability reports. But also, personnel at operational locations such as manufacturing facilities should be solicited for feedback. Many individuals at operations locations are owners of location-specific data and are responsible for reporting location data to headquarters or corporate. Finally, senior managers should be engaged. Although they may not physically use tools employed to manage GHG data, senior managers are an important source for the understanding of corporate GHG goals and visions for the future.

Figure 3. First Stage of the Common-Sense Approach



Stage 2: Technical Requirement Generation

The next Stage is to complement the business needs collected and documented through the first Stage of the approach with technical requirements. ***Technical Requirements*** are defined as the information technology requirements that must be considered for any GHG information management solution. To effectively generate technical requirements, two key foci should be considered: Corporate Information Technology Standards and Existing Information Management Tools (Figure 4).

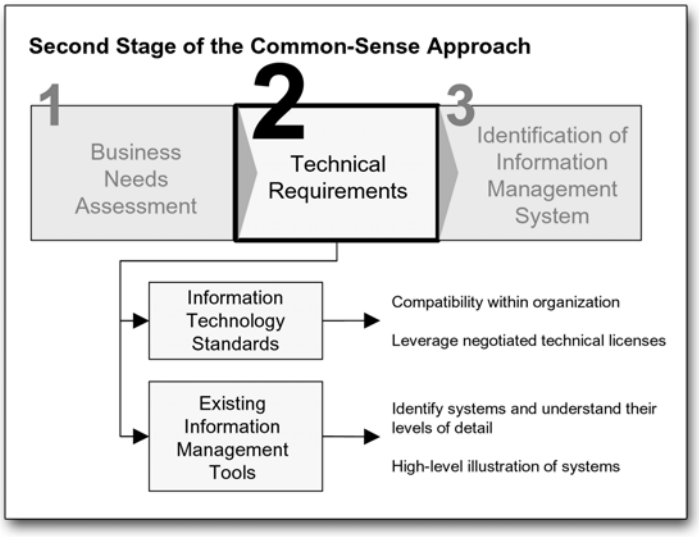
Information Technology Standards. The first focus is to understand the information technology standards used within a company. In many instances, corporate standards and rules have been established for information technologies to ensure compatibility within an organization and to leverage negotiated software and hardware licenses.

Because information management solutions for GHG and energy are likely to employ software solutions, examining GHG business needs alone without consideration of corporate information technology standards could create an avoidable disconnection. Key considerations include security, software preferences, and web delivery.

Existing Information Management Tools. The second focus for documenting technical requirements is to understand existing information management tools. In many cases, data gathering requirements identified in Business Needs Assessment are already available in corporate databases. Identifying these systems and understanding their levels of detail provides a useful vision of their utility and potential leveragability.

In addition to documenting information of relevant existing systems, a good idea is to create a high-level illustration of the relationships of these systems. This architecture diagram is a very useful tool for understanding the scope of relevant information management tools and a very useful for future solution designs, system connectivity, or system consolidations.

Figure 4. Second Stage of the Common-Sense Approach



Stage 3: Identification of Information Management System

The final Stage of the Common-Sense Approach is the ***Identification of Information Management System***. This Stage utilizes the business needs documented in Stage 1 and the technical requirements listed in Stage 2 as the foundation for identifying the most appropriate solution for GHG information management. To create a disciplined evaluation, two key components should be considered: (1) use a systematic evaluation methodology and (2) have eventual system users weigh the importance of evaluation criteria (Figure 5).

Systematic Evaluation Methodology. Selection of the information management tool should be performed with a systematic approach. A methodology for selection should be agreed upon that is suitable for the project and has sufficient reasoning behind it. Some examples of information technology capital investment selection methodologies include Phillips et. al., 2002[4], Wanyama and Far, 2003[5], and the Value Measuring Methodology, 2002[6]. The selected methodology should have buy-in from participants at all levels of the company, especially those who will be presenting the information management plan to senior management. Using these methodologies

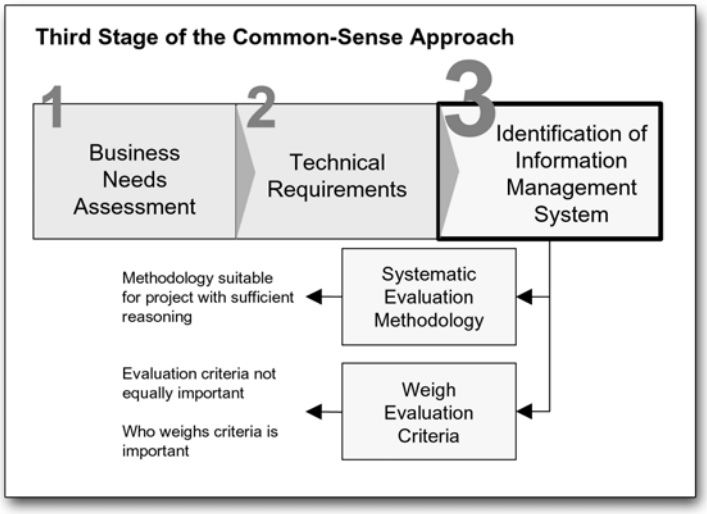
System Evaluation Highlight

Inviting feedback from a variety of GHG system end users is an ideal way to make sure evaluation criteria a weighed appropriately. Moreover, involving end users early in the project creates a sense of ownerships among the user community and is an effective means of increasing user acceptance when the eventual system is implemented.

demonstrates clear due diligence for researching the most appropriate options and provides a more meaningful Return on Investment business case.

Weigh Evaluation Criteria. Weighing evaluation criteria is often part of a systematic evaluation methodology (see above references). Recognizing that not all evaluation criteria are equally important is a critical component of an effective evaluation. However, a very important consideration for weighing criteria is who weighs the criteria. Inviting feedback from a variety of GHG system end users is a great way to make sure that evaluation criteria are weighed appropriately. Moreover, involving end users early in the project creates a sense of ownerships among the user community and is an effective means of increasing user acceptance when the eventual system is implemented.

Figure 5. Third Stage of the Common-Sense Approach



Rewards of the Common-Sense Approach

The Common-Sense Approach has been designed to recognize that companies are at different levels of familiarity or robustness for performing a GHG inventory. Regardless of a company's GHG tracking initiatives, the approach will benefit companies' GHG information management strategies. To understand the results of the approach and how the approach might impact different types of companies, three categories representing different levels of GHG tracking have been created:

- **Introduction**. These companies are just beginning to consider GHG tracking, learning the scope of the issue, and to what extent relevant information will be tracked.
- **Recent GHG Investment**. These companies have recently begun to track corporate GHG information and have made investments to gather and manage data.
- **Established Inventory**. These companies have been tracking GHG information for many years and may be considered corporate leaders. They have many tools in place for managing GHG information.

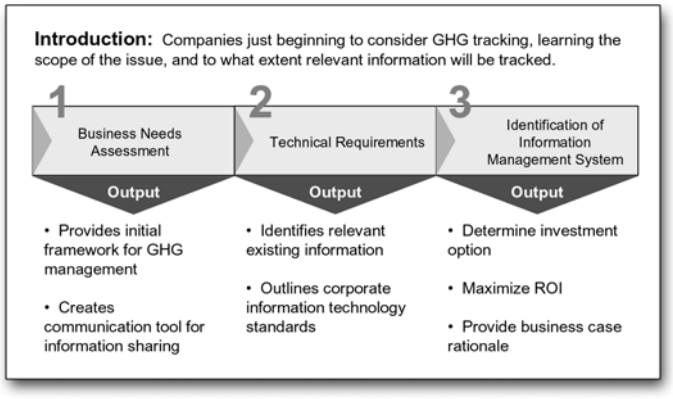
Introduction Companies

The business needs assessment will provide one of the first outlines for the scope of GHG inventory information management needs (Figure 6). In effect, the assessment serves as a type of project plan for the necessary components of creating a corporate GHG inventory. In addition, this outline will be a valuable tool for internal coordination between corporate entities that may "own" relevant data sources. For example, the business needs assessment may identify fleet emissions as an important direct emissions source and list several necessary data fields. That section of the assessment will serve as a valuable communication tool between the corporation's fleet managers, who may own fleet data that may serve the GHG inventory needs, and the GHG assessment management team, working to mesh individual measures into an integrated picture.

In the technical requirements phase, a review of corporate information technologies is provided and existing systems that may be of use for the GHG inventory, are identified. One of the greatest benefits of the Common-Sense Approach for GHG Introduction companies is the opportunity to identify relevant existing information sources and leverage the investments made in them. There may be several relevant operational databases that contain important electricity and fuel consumption information necessary for GHG inventories.

The identification of an information management system may serve as one of the first significant investments made by an Introduction company for a corporate GHG inventory. As a result, the Return on Investment information provided as part of the systematic evaluation can provide important business case rationale, not only for the information management system, but the GHG inventory as a whole.

Figure 6. Introduction Companies. What companies who are beginning a GHG inventory can expect from the Common-Sense Approach



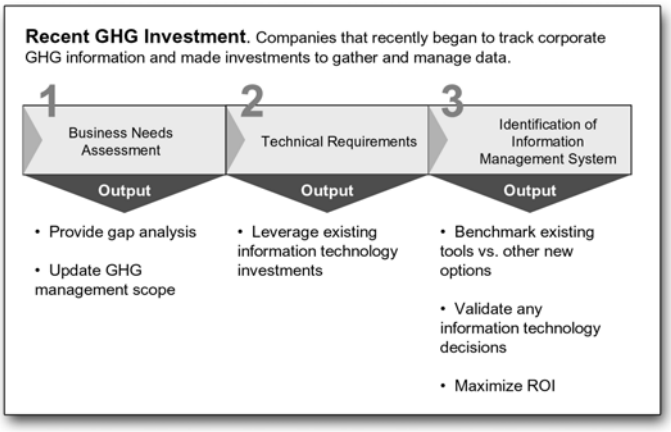
Recent GHG Investment Companies

For companies who have recently made GHG inventory information management investments, the 'Business Needs Assessment' will serve as a review of recent GHG inventory tools to ensure that needs have not evolved beyond tool functionality (Figure 7). Should needs change, the assessment will serve as a gap analysis, identifying both functionality that is currently supported and highlighting necessary functions that are not. This gap analysis can serve as a list of necessary upgrades to the current GHG inventory tools. Should the gaps be significant and tools not sufficiently adaptable, the gap analysis may serve as rationale for investigating new options for GHG management tools.

The technical requirements phase will also be useful to companies who have made recent investments. Although these companies may have already identified existing information sources within the corporation that contain relevant GHG information, reviewing existing tools may uncover means to connect information sources or create more efficient methods for transferring data.

Finally, the systematic evaluation can serve as a benchmarking effort to ensure that the recently invested tools are the most appropriate and are providing the best value to the company. Should other options be more favorable, those recommendations can serve as potential modifications to the GHG information management strategy.

Figure 7. Recent GHG Investment Companies. What companies who are recent investors in a GHG inventory can expect from the Common-Sense Approach



Established Inventory Companies

Similar to companies who have made recent GHG information management investments, companies with established GHG inventory programs can use the 'Business Needs Assessment' as a tool to understand whether needs have grown beyond the functionality of current tools (Figure 8). The 'Business Needs Assessment' is also a great opportunity to define anticipated future needs and to determine whether current tools can accommodate those anticipated requirements.

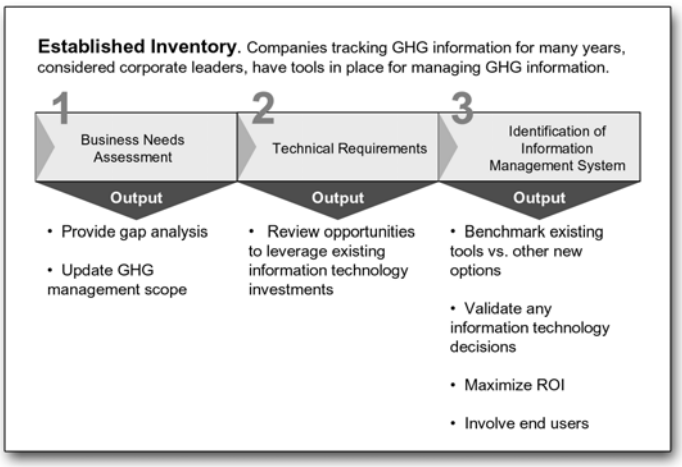
Established companies are likely to have already identified relevant GHG information sources, however, the technical requirements may identify more efficient means to connect systems and transfer data. In many circumstances, data between multiple sources is manually loaded in off-line spreadsheets, which are inefficient and increase the likelihood of errors.

Case Study – Established Company

The Common-Sense Approach can reveal value-added options for GHG information management, even for companies who have been tracking GHG gases for many years. Value-added options need not necessarily be software replacements. In many cases, the Common-Sense Approach leverages existing systems by complementing them with additional functionality. For example, many companies have multiple databases with relevant GHG information. However, to combine data, information must be manually extracted into spreadsheets and transferred to other databases to create combined analyses. For some companies, this process can be streamlined and improved by introducing Extraction, Transfer, and Load (ETL) software to connect systems and create a common data warehouse for all GHG data.

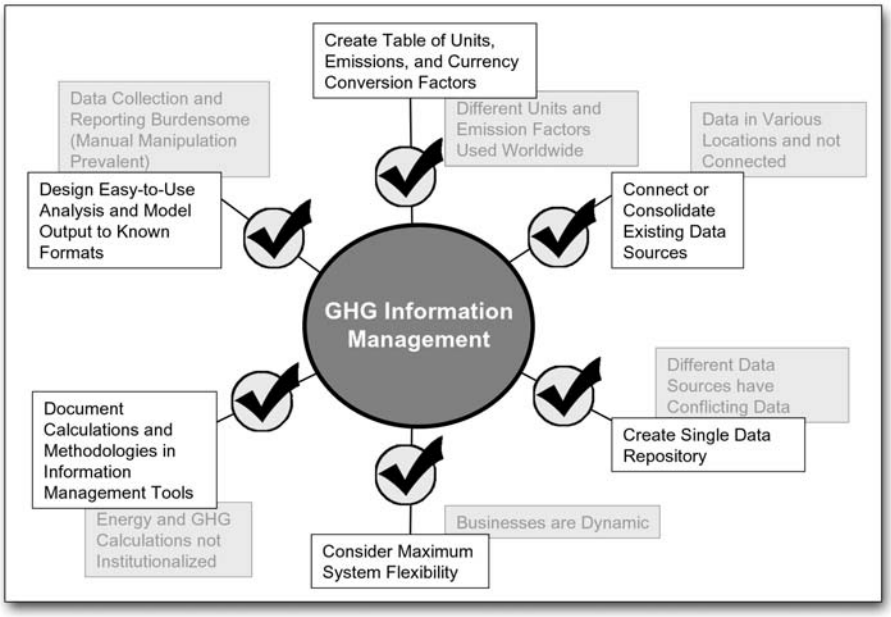
Finally, for established companies the systematic evaluating and weighing of evaluation factors is especially important. Because GHG information management investments have already been made, the systematic evaluation is very important for evaluating needs and providing a business case for why updates are necessary to accommodate new needs for GHG inventory management. Another key component, as discussed in Stage 3 (see previous section) is to involve end users in weighing evaluation criteria. For a company with an established GHG program, this is especially important because end users are likely to have become accustomed to current tools. Involving these users in the weighing and evaluation process provides a sense of what is good about current tools and what needs improvement. Additionally, end user involvement during the first Stages of reviewing information management tools is a very effective means for improving user acceptance of the eventual solution.

Figure 8. Established Inventory Companies. What companies who are established in GHG inventory can expect from the Common-Sense Approach



A disciplined approach to GHG management, the common sense approach will solve the challenges companies have toward the process. Figure 9 shows the ways the Common-Sense Approach addresses the challenges companies face.

Figure 9. Solutions to challenges companies face regarding GHG management



Conclusion

Although not fancy, the Common-Sense Approach outlines the key components to address the information management gap between GHG inventory methodology and reporting output necessary for participating in GHG registries and voluntary programs. The Stages of the approach address common GHG management challenges and provide

valuable insight for any company's strategy for managing a corporate GHG inventory. Repeating components of the Common-Sense Approach every few years can be a valuable strategy to ensure management tools are adaptable to the dynamic need of GHG management.

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