STUDENT ARTICLES

MANDATORY CORPORATE GREENHOUSE GAS EMISSIONS DISCLOSURE TO ENCOURAGE CORPORATE SELF-REGULATION OF EMISSIONS REDUCTION

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INTRODUCTION

Companies can no longer afford to ignore the enormous risks and opportunities that climate change presents. There is increasing pressure to report and deliver not only financial performance, but also innovative social and environmental performance.[1] A survey of one hundred leading business analysts found that 64 percent strongly agreed that corporate social and environmental responsibility will affect their own decisions and that 42 percent strongly agreed that corporate responsibility will affect share price.[2] International agreements, primarily the Kyoto Protocol, are another impetus for companies to monitor their greenhouse gas (GHG) emissions.[3] Although the Kyoto Protocol requires countries, not companies, to comply with reporting and reduction of GHG emissions, companies must understand how current global

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[1] MICHAEL MARGOLICK & DOUG RUSSELL, CORPORATE GREENHOUSE GAS REDUCTION TARGETS 5–9 (2001), *available at* http://www.pewclimate.org/docUploads/ghg_targets.pdf. *See, e.g.*, Press Release, Kohlberg Kravis Roberts & Co. & Envtl Def. Fund, Kohlberg Kravis Roberts & Co. and Environmental Defense Fund Annonunce First-of-Its-Kind "Green Portfolio" Partnership (May 1, 2008), *available at* http://www.edf.org/pressrelease.cfm?contentID=7870; Claudia H. Deutsch, *Companies Improve Scores in Climate-Change Ranking*, N.Y. TIMES, May 7, 2008.

[2] MARGOLICK & RUSSELL, *supra* note 1, at 6.

[3] Thomas M. Kerr & Richard M. Saines, *International Climate Change and Corporate Action*, 18 NAT. RESOURCES & ENV'T 51, 55–56 (2004).

policy decisions affect their operations. In addition, companies must also be aware of the risks and opportunities created by changing federal, state, and local regulations on GHG emissions. Although a federal regulatory regime has yet to be agreed upon, there is active ongoing discussion of the optimal regulatory system.[4] In the meantime, states have actively taken steps to regulate climate change, including forming regional agreements such as the Regional Greenhouse Gas Initiative by the Northeast and Mid-Atlantic states and developing GHG emissions programs such as the Eastern Climate Registry and California Climate Action Registry.[5] Companies also face risks from direct physical impacts from climate change. According to the report released on November 17, 2007 by the Intergovernmental Panel on Climate Change, climate change will very likely bring about an increase in tropical storms, droughts, and other natural disasters.[6]

However, many companies do not have the measurement standards and processes to determine the size of their individual corporate carbon footprint. In order for businesses to effectively reduce GHG emissions, they must (1) assess their current emissions level, (2) analyze the possibility of reducing their emissions levels, (3) set emissions reduction goals, and (4) prepare and execute a GHG reduction strategy.

This paper will first look at why a reporting regime should be adopted by analyzing another environmental reporting regime, the Toxics Release Inventory. Next, the paper will examine the current voluntary GHG emissions reporting programs that exist. The paper will then argue for a mandatory disclosure requirement and describe how it should be structured: the measurement issues, the program scope and design, and the enforcement mechanisms. In addition, the paper will address some concerns with the mandatory disclosure requirement.

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[4] *See* Deborah Zabarenko, *US Climate Bill Dies; Hope for 2009*, REUTERS, June 6, 2008, *available at* http://www.reuters.com/article/idUSN06383064.

[5] Randall S. Abate, *Kyoto or Not, Here We Come: The Promise and Perils of the Piecemeal Approach to Climate Change Regulation in the United States*, 15 CORNELL J.L. & PUB. POL'Y 369, 376–84 (2006).

[6] INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT 46–53 (2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

I. THE IMPACT OF REPORTING: LEARNING FROM TRI

The traditional tools that the U.S. has relied on to protect environmental quality are mandatory command and control environmental regulations. Although these regulations have been somewhat successful in improving environmental quality, such command and control regulations have resulted in a policy framework that is "inflexible and costly and whose effectiveness in further improving the environment may be diminishing."[7] On the other hand, the "growing stringency of environmental regulations, rising costs of compliance with inflexible technology-based regulations, threat of liability for environmental damage, environmental concerns among consumers, reputation with shareholders and the public" are motivating proactive measures by firms to engage in corporate environmentalism.[8] Such developments suggest possible advantages in a new generation of policy instruments. These include information-based and management-based regulation that transcends the government-mandated regulation mechanism by motivating voluntary, self-regulatory actions by firms to improve their environmental performance through incentives such as increasing firm reputation and earning higher profits.[9]

Such information-forcing instruments are suitable in achieving regulatory goals that are designed to (1) target a wide scope of actors; (2) where the regulatory burden of command and control regulation is significant; (3) where the person that bears the least cost of information disclosure is the actor itself; and (4) where external stakeholder pressures develop from the information disclosed. One example of such a policy instrument is the Toxics Release Inventory (TRI), which requires the public disclosure of toxic emissions of firms.

TRI requires reports from the manufacturing sector and certain industrial facilities on their toxic emissions measurements.[10] The data is publicly accessible, but there is no

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[7] Madhu Khanna & William Rose Q. Anton, *Corporate Environmental Management: Regulatory and Market-Based Incentives*, 8 LAND ECONOMICS 539, 539 (2002).

[8] *Id.* at 540.

[9] Cary Coglianese & David Lazer, *Management-Based Regulation: Prescribing Private Management to Achieve Public Goals*, 37 LAW & SOC'Y REV. 691, 695–96 (2003).

[10] U.S. ENVTL. PROT. AGENCY, WHAT IS THE TOXICS RELEASE INVENTORY

obligation to keep emissions below a certain threshold, only a requirement that the regulated industries inform the public how much they have released.[11] "When Congress required firms to publicly report their releases of toxic substances, the main purpose was to inform employees and the public and at best to indirectly catalyze external forces in pressuring firms' internal management to reduce toxic emissions."[12] However, "[a]fter the release of the first required report, some private sector managers were shocked to hear that their company's releases put them at or near the top of EPA's [U.S. Environmental Protection Agency's] list of polluters."[13] The TRI even had an impact on firms which were in compliance with EPA rules by putting their reputation at stake through the publicly available TRI listing because "no major firm wants to be listed as one of the 'dirty dozen'."[14] In these firms, "information disclosure triggered intense management attention, goal setting, training, information collection and monitoring."[15] Monsanto, for example, responded to TRI in the first year of required reporting by launching a voluntary emissions program on the realization that it would get negative consumer and market responses with its current emissions numbers.[16] In 1998, Monsanto announced that it was "setting out to reduce its toxic emissions to air by 90% within 5 years" and by 1992, Monsanto claimed that "it had spent $100 million on the program and topped its own goal by cutting its worldwide toxic emissions to air by 92%."[17]

The foundation of TRI's effectiveness lies in the "public

(TRI) PROGRAM, http://www.epa.gov/tri/triprogram/whatis.htm (last visited June 10, 2008); *see also* Jeffrey C. Terry & Bruce Yandle, *EPA's Toxic Release Inventory: Stimulus and Response*, 18 MANAGERIAL & DECISION ECON. 433, 433 (1997).

[11] Robert J. Klee, Note, *Enabling Environmental Sustainability in the United States: The Case for a Comprehensive Material Flow Inventory*, 23 STAN. ENVTL. L.J. 131, 158 (2004).

[12] Cary Coglianese & Jennifer Nash, *Management-Based Strategies: An Emerging Approach to Environmental Protection*, *in* LEVERAGING THE PRIVATE SECTOR: MANAGEMENT-BASED STRATEGIES FOR IMPROVING ENVIRONMENTAL PERFORMANCE 3, 8 (Cary Coglianese & Jennifer Nash, eds., 2006); *see also* WHAT IS THE TOXICS RELEASE INVENTORY (TRI) PROGRAM, *supra* note 10.

[13] Coglianese & Nash, *supra* note 12, at 8.

[14] Terry & Yandle, *supra* note 10, at 433.

[15] Coglianese & Nash, *supra* note 12, at 8.

[16] Richard Dahl, *Now That You Know*, 105 ENVTL. HEALTH PERSP. 38, 39 (1997).

[17] *Id*.

disclosure of information."[18] The disclosure of information itself creates internal pressure to be more cost-efficient and external pressure to obtain a better reputation.[19] Each pressure system feeds off of the other and they create an environment for significant reductions in toxic releases. Internal pressures exist from the assessment itself. One can only take action when there is sufficient knowledge of the status quo. Once the firm managers realize the extent of toxic emissions, they can understand how inefficient their emissions are, what processes are causing inefficiencies, and what steps they can take to reduce such inefficiencies. Another source of internal pressure comes from internal employees and stockholders who are personally vested in the company and want to know that it is operating in an environmentally and socially conscious manner.[20]

External pressures come from both the competition that public disclosure fosters and the concern for public reputation. Public disclosure encourages firms to engage in benchmarking, both internally and externally, by providing a standardized means to "compare, rank, and track performance among production processes, facilities, operating units, and peer or competitor firms."[21] In addition, no company wants to have the reputation as the biggest polluter, and thus information disclosure induces "environmentally friendly competition."[22] Fear of public reaction puts external pressures on firms to reduce toxic emissions coming from their emissions disclosure. According to empirical research on TRI, companies take into consideration their exposure to consumer markets and thus make greater progress in reducing their emissions.[23] The anticipated consumer reaction in response to information about the emission levels is sufficient for companies

[18] Klee, *supra* note 11, at 158–62.

[19] *Id.*

[20] *Id* at 158–60.

[21] Bradley C. Karkkainen, *Information as Environmental Regulation: TRI and Performance Benchmarking, Precursor to a New Paradigm?*, 89 GEO. L.J. 257, 261 (2001).

[22] Klee, *supra* note 11, at 160.

[23] There is empirical research showing that reductions in pollution after TRI information is released is linked to education and income of communities, which in turn is linked to better-informed consumers. Better-informed and more sensitive consumers lead to greater community pressure, which companies evaluate in reducing their emission levels. Werner Antweiler & Kathryn Harrison, *Toxic Release Inventories and Green Consumerism: Empirical Evidence from Canada*, 36 CAN. J. ECON. 495, 499; *see also* Deutsch, *supra* note 1.

to undertake more stringent measures in curtailing their pollution emissions.[24] Public interest groups may engage in a form of environmental blacklisting to place pressure on the worst performers.[25] Investors may also place similar pressure by devaluing a poor TRI performer's stock as "indicative of overall poor management."[26] While consumers are becoming increasingly environmentally conscious, financial institutions are also beginning to include environmental considerations in their lending decisions and viewing poor environmental performers as financially risky.[27] Several studies show that "public disclosures of the TRI led to significantly negative stock market returns for poor environmental performers" and "pressure from shareholders was found to be significant in motivating firms to adopt an environmental plan."[28]

As seen from the TRI example, even though TRI's express goal was not for firms to reduce emissions, but to inform firm employees and residents neighboring firm facilities of the toxicity of the firms' emissions, it did much more. Information disclosure in and of itself can stimulate firms to voluntarily act in response to internal pressures, environmental industry competition, perceived market reactions, shareholder pressures, consumer behavior, and other stakeholder demands in order to stem the fear of a bad reputation, a potential lawsuit, or further government regulation. Such self-regulation encouraged by information disclosure gives decision making responsibility to the least cost avoider, those with the most information about the risks and possible solutions.[29] Thus, instead of government bodies mandating rigid targets to which firms must adhere, it provides firms with more flexibility to experiment and create innovative solutions that are tailored to their business and circumstances.[30]

"Information disclosure may be a key catalyst or at least a minimum condition in initiating stakeholder involvement and

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[24] Antweiler & Harrison, *supra* note 23, at 499.

[25] Klee, *supra* note 11, at 163 (finding that TRI reports form the equivalent of environmental blacklists, which inform public interests about which firms to target).

[26] *Id.*

[27] *See* Khanna & Anton, *supra* note 7, at 543.

[28] *Id*.

[29] *See* Coglianese & Lazer, *supra* note 9, at 695.

[30] *Id*. at 696.

voluntary problem solving" in terms of GHG emissions reduction.[31] It would at the least trigger a cost-benefit analysis of firms as to whether or not it is more costly to improve the information to avoid negative publicity or to reduce GHG emissions. Taking this concept and expanding it further, I argue that we should apply a similar mandatory information disclosure regulation to GHG emissions by firms.

II. CURRENT VOLUNTARY REPORTING OF GHG EMISSIONS

Currently, various voluntary GHG reporting programs already exist. Some examples are the EPA Climate Leaders, the Department of Energy Voluntary Disclosure of Greenhouse Gases, the Carbon Disclosure Project, and the Climate Registry.

The EPA Climate Leaders was launched in February 2002 as a voluntary industry-government partnership that works with companies to develop comprehensive climate change strategies.[32] Participating "companies commit to reducing their impact on the global environment by" utilizing a quality management system in "completing a corporate-wide inventory of their greenhouse (GHG) gas emissions, setting reduction goals, and annually reporting their progress to EPA."[33] Through program participation, companies build up their reputation as "corporate environmental leaders."[34] The participating companies submit an annual GHG Inventory Summary and Goal Tracking Form that lists the target emissions of the company and each year's annual GHG emissions.[35] This form tracks direct emissions through stationary combustion sources, mobile combustion sources, refrigeration equipment use, and fugitive sources; and indirect emissions through purchased and used electricity, steam, hot water, and chilled water.[36] EPA also provides technical assistance in the development of a GHG inventory and the design of an effective environmental management system that enables companies to meet

[31] Klee, *supra* note 11, at 167.

[32] U.S. ENVTL. PROT. AGENCY, BASIC INFORMATION, CLIMATE LEADERS, http://www.epa.gov/stateply/basic/index.html (last visited June 10, 2008).

[33] *Id.*

[34] *Id.*

[35] U.S. ENVTL. PROT. AGENCY, A PROGRAM GUIDE FOR CLIMATE LEADERS 7 (2007), *available at* http://www.epa.gov/stateply/documents/cl_programguide_508.pdf.

[36] *Id.*

their target goals.[37] EPA has developed resources to assist the participating companies such as "the Climate Leaders Inventory Guidance, which is based on an existing corporate GHG protocol developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD)."[38] As of October 11, 2008, 225 companies are participating in the Climate Leaders program, ranging "from Fortune 100 corporations to small businesses and represent[ing] many industries, from manufacturers and utilities to financial institutions and retailers."[39]

The Department of Energy also has a Voluntary Reporting of Greenhouse Gases Program, established under Section 1605(b) of the Energy Policy Act of 1992, which records "the results of voluntary measures to reduce, avoid, or sequester greenhouse gas emissions."[40] For 2005, "221 U.S. companies and other organizations reported to the Energy Information Administration (EIA) that they had undertaken 2,379 projects to reduce or sequester greenhouse gases in 2005."[41] According to the EIA, the Voluntary Reporting Program permits three distinct types of reporting: (1) project-level reporting, defined as the reporting of the emission reductions or carbon sequestration achieved as a result of a specific action or group of actions; (2) entity-level reporting, defined as the reporting of emissions, emission reductions, and carbon sequestration for an entire organization, usually defined as a corporation; and (3) commitment reporting, defined as the reporting of pledges to take action to reduce emissions in the future.[42] All non-confidential reports received by the program are compiled into a Public Use Database that can be downloaded online. Many of the companies who voluntarily report to the EIA also report to the EPA through the Climate Leaders program. Unlike the Climate Leaders program, there is no commitment requirement for companies who report to the EIA to reduce emissions or engage in a GHG emissions management

[37] *Id.*

[38] BASIC INFORMATION, CLIMATE LEADERS, *supra* note 32.

[39] U.S. ENVTL. PROT. AGENCY, CLIMATE LEADERS, http://www.epa.gov/stateply/index.html (last visited Oct. 11, 2008).

[40] ENERGY INFO. ADMIN., VOLUNTARY REPORTING OF THE GREENHOUSE GASES 2005 – SUMMARY, http://www.eia.doe.gov/oiaf/1605/vrrpt/summary/introduction.html (last visited June 10, 2008).

[41] *Id.*

[42] *Id.*

strategy. In addition, there is no analysis provided as to the total emissions level. In 2002, the reported total emissions actually increased substantially in response to increased market demand.[43] Others committed to actions that they would have implemented anyway due to business reasons.[44]

The Carbon Disclosure Project (CDP) is an organization that compiles GHG emissions data from companies worldwide. Unlike the programs mentioned above, it is an independent not-for-profit organization that seeks information for institutional investors on the business risks and opportunities presented by climate change and GHG emissions data from the world's largest companies.[45] In 2008, it requested information from 3,000 companies and received responses from over 1,550, which included 77 percent of the Fortune 500 companies.[46] "CDP leverages its data and process by making its information requests and responses from corporations publicly available."[47] In February 2008, CDP issued its sixth information request which is comprised of four sections: (1) risks and opportunities; (2) GHG emissions accounting; (3) current performance against targets and plans to reduce GHG emissions; and (4) the responsibility and management approach to climate change.[48] There is flexibility for companies to respond to only "minimum standards" questions, although companies in carbon-heavy industrial sectors are encouraged to complete both "minimum standards" questions and "comprehensive response" questions.[49] All companies are required to disclose their climate change risks, opportunities, and strategies and provide measurements of the company's direct and indirect GHG emissions, in tons of carbon dioxide ($CO_{2)}$ emitted. Companies also must record the amount of purchased electricity and

[43] ROBERT R. NORDHAUS & KYLE W. DANISH, DESIGNING A MANDATORY GREENHOUSE GAS REDUCTION PROGRAM FOR THE U.S. 5–6 (Pew Center on Global Climate Change ed., 2003). *available at* http://www.pewclimate.org/global-warming-in-depth/all_reports/mandatory_ghg_reduction_prgm.

[44] *Id.*

[45] CARBON DISCLOSURE PROJECT, http://www.cdproject.net (last visited Oct. 23, 2008).

[46] CARBON DISCLOSURE PROJECT, FAQS, http://www.cdproject.net/faqs.asp (last visited Oct. 23, 2008).

[47] CARBON DISCLOSURE PROJECT, *supra* note 45.

[48] CARBON DISCLOSURE PROJECT, CDP6 LETTER AND QUESTIONNAIRE (2008), *available at* http://www.cdproject.net/questionnaire.asp.

[49] *Id.*

percentage of purchased electricity which comes from renewable energy sources. Respondents are directed to use the methodology of the GHG Protocol developed by the WRI and WBCSD. For companies within carbon-heavy emission industries—such as those in automobiles, aerospace, chemicals, construction, electric utilities, energy equipment & services, oil, gas & consumable fuels, metals & mining, paper & forest products, and transportation, the CDP requires a detailed "comprehensive response" on GHG emissions management strategy and the corporate governance structure for climate change management within the company. The CDP then compiles the data that it gathers and annually releases a public report.

The Climate Registry is a collaboration between states, provinces and tribes aimed at developing and managing a common GHG emissions reporting system.[50] Its goal is to standardize GHG accounting and reporting rules across multiple jurisdictions and to provide businesses with a means of publicly recording their emissions comprehensively in a single consistent and comparable report.[51] Reporting is open to all legal entities (e.g., corporations, institutions, and organizations) recognized under U.S., Canadian or Mexican law.[52] The Climate Registry also adopts the GHG inventory protocol developed by the WRI and WBCSD. The focus of the GHG reporting under the Climate Registry is on entity-wide emissions rather than the reporting of emissions reductions such as the Department of Energy (DOE) Voluntary Reporting of Greenhouse Gases Program.

These programs create incentives for companies to participate by providing external recognition for their disclosures. EPA also provides technical assistance in the Climate Leaders program to develop a GHG inventory, which requires technical expertise that companies, especially those of small scale, may not have. However, all four reporting programs are voluntary and thus, there is no sanction for failure to report. Because of the relatively small number of participants in the two government programs in particular, there is little disadvantage for failure to participate. Failure to participate does not necessarily mark a firm as being

[50] THE CLIMATE REGISTRY, http://www.theclimateregistry.org/index.html (last visited June 10, 2007).

[51] *Id.*

[52] *Id.*

environmentally irresponsible. The firms who do participate are likely those who already have strong environmental programs in place. In addition, the information provided under these programs is difficult for the public to meaningfully assess. There is no comparison or benchmark provided, and thus, it is difficult to assess whether the reporting companies are doing a "good job" in being energy efficient and reducing greenhouse gases. In addition, the data is also easily manipulated as firms can choose to appear as if they are reducing GHG emissions by outsourcing, divesting facilities, or rearranging their firm structure. Although firms with a good track record under such voluntary programs may receive favorable external reactions, failure to participate or lack of strong reduction goals may not generate both the internal and external pressures necessary to encourage companies to proactively reduce GHG emissions. The fundamental limitation lies in the voluntary aspect itself: these programs only address the emissions of those firms that volunteer; while this information is helpful in building awareness, encouraging experimentation and achieving some company level emissions reductions, the impacts are limited.

III. PROPOSAL FOR A MANDATORY GHG EMISSIONS DISCLOSURE PROGRAM

A. *A Mandatory Program Is Necessary to Create a Level Playing Field that Will Leverage the Internal and External Pressures that Information Disclosure Creates for Companies to Reduce Their GHG Emissions*

The purpose of information disclosure is to provide greater information both internally and to the public. By providing greater information to internal management through voluntary measures, firm managers will become more aware of and concerned about their organization's social outputs and the gathering of information will be the basic step upon which management can develop plans and procedures based on the information they gather and the analysis they conduct.[53] Internally, firms may profit through the internal pressures triggered by the gathering of this information. It will enable companies to identify opportunities to reduce their energy usage, reduce greenhouse gas emissions associated with

[53] *See* Coglianese & Lazer, *supra* note 9, at 695–96.

this energy usage, and increase the corresponding energy cost savings opportunities.[54] Therefore, by making new technologies and equipment more energy-efficient or by improving resource productivity, the firm may be able to reduce operating costs and be more profitable.[55]

Firms are also subject to external pressures which may lead them to be proactive in monitoring and reducing emissions. Companies with low GHG emissions or a strong GHG emissions reduction plan can increase revenue through enhanced market reputation,[56] and may also decrease their potential environmental liability. There is much empirical evidence that ties superior environmental performance to financial performance.[57] From the investor's perspective, superior environmental performance reflects positively on the firm's reputation and leads to a substantial reduction in perceived risk of the firm, increasing a public company's stock price.[58] This reputation effect is also reflected in the customer viewpoint, boosting sales revenue for the firm.[59]

However, the emissions reductions realized in response to such pressures still fall short of the reductions that would be required in a mandatory program.[60] Firms may voluntarily adopt programs that comply with non-mandatory guidelines simply as a public relations ploy rather than as a serious and genuine effort to achieve the goals that motivated government to issue the guidelines. With voluntary commitments—in the absence of any enforcement regime to ensure that firms implement their plans—it will undoubtedly be tempting for some firms to enhance their reputation as being environmentally responsible but continue

[54] CHRISTOPHER P. LORETI ET AL., AN OVERVIEW OF GREENHOUSE GAS EMISSIONS INVENTORY ISSUES 1 (Pew Center on Global Climate Change ed., 2000), *available at* http://www.pewclimate.org/global-warming-in-depth/all_reports/inventory_issues.

[55] Glen Dowell et al., *Do Corporate Global Environmental Standards Create or Destroy Market Value?*, 46 MGMT. SCI. 1059, 1072 (2000).

[56] Coglianese & Nash, *supra* note 12, at 185.

[57] Dowell et al., *supra* note 55, at 1060; *see* Michael E. Porter & Claas van der Lind, *Green and Competitive: Ending the Stalemate*, *in* THE DYNAMICS OF THE ECO-EFFICIENT ECONOMY: ENVIRONMENTAL REGULATION AND COMPETITIVE ADVANTAGE 37–43 (Emiel F.M. Wubben ed., 2000).

[58] Dowell, *supra* note 55, at 1060.

[59] Coglianese & Nash, *supra* note 12, at 185.

[60] *See* NORDHAUS & DANISH, *supra* note 43, at 5.

emitting GHG emissions.

The regulated community wants a level playing field before it will expend significant costs to make GHG reductions.[61] Therefore, only when a mandatory federal program is in place will companies make significant progress in reporting and reducing. Without a regulatory mechanism that will require each actor to be accountable, the problem of the tragedy of the commons will exist, where although society as a whole has the incentive to reduce GHG emissions, each social actor has no short-term incentive to do so. By introducing an information forcing mechanism, each actor will be accountable for its own GHG emissions and will be put under public scrutiny as to whether it is implementing strategies to reduce its emissions and become more energy efficient.

A mandatory regulation will require all companies to assess their current emissions levels. With this information, companies can properly assess the opportunities and risks that their carbon footprint provides and adopt appropriate strategies that will benefit the company through lower costs and increased efficiency. In addition, in order for consumers, investors, and other external stakeholders to exercise pressure on firms, there has to be a context to determine which firms are doing a good job and which are not. These market conclusions do not occur in a vacuum, but occur in comparison to similar firms in the same industry. Managers need to understand how their firm is doing in comparison to competitor firms to provide a benchmark against which to measure their GHG performance. With only a few participants, it is difficult to assess which firms are emitting GHG above and beyond its industry peers and which firms are reducing GHG emissions to be as close to the baseline as possible. Thus mandatory disclosure will provide the context that firms can use to analyze their individual performance against competitors. As we saw in the TRI case, firms are loathe to be the top polluting or GHG emitting company; thus, such public disclosure will create the competitive pressure that will give companies the incentive to adopt measures to reduce their GHG emissions and "race to the top."

In addition, mandatory disclosure will provide the government with data to determine the extent to which GHG emissions must be reduced and provide emissions standards and

[61] *See* Porter & van der Lind, *supra* note 57, at 44.

goals that firms should strive to meet. Internally, this will give firms a benchmark against which to assess their performance and their progress in meeting GHG goals; externally, this will provide a measure for comparison. On the other hand, with the data gathered through this program, the government now has the proof that companies are acting responsibly by reducing GHG emissions, creating new energy-efficient technologies, using alternative fuels, or employing other such climate-friendly measures. Firms will have further incentive to "show off" that they are being climate-friendly with hard data to back them up. Where it might not have been credible enough for firms to argue that they are climate-friendly merely because they are adopting different programs for better GHG emission performance voluntarily, they can now show the improvements they have made in concrete numbers benchmarked against concrete standards. However, these bragging rights also come with the obligation to meet any GHG emission goals that firms may choose to set. Thus, by making the GHG emissions information public, firms will be held accountable to thier stakeholders for adhering to their GHG emissions goals and strategies.

B. *GHG Measurement Issues to Consider in Framing a Mandatory Reporting Regime*

There are some important questions to resolve in determining how to frame a mandatory reporting regime. Some important questions that must be addressed are: (1) What emissions is the company responsible for?; (2) How should the emissions be measured?; (3) How should the firm determine the baseline emissions?; and (4) How can emissions be meaningfully compared?

(1) *What Emissions Is the Company Responsible For?*

The first question is to determine which emissions the company is responsible for. This requires determining the type of gases, the geographic source of gases, and the ownership of the facilities that emit the gases. The reporting system should take into account existing global GHG regimes which the U.S. may agree to participate in in the future, and also existing voluntary GHG regimes that some companies have already adopted in order to increase compatibility with other regimes and decrease incremental costs of compliance. Thus, in terms of the gases that

must be reported, all six gases regulated under the Kyoto Protocol should be accounted for: carbon dioxide (CO_2); methane (CH_4); nitrous oxide (N_2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulfur hexafluoride (SF_6). The emissions from the other non carbon dioxide gases can be converted into metric tons of carbon dioxide equivalents by using a multiplier.

In terms of geography, although GHG emissions from outside the U.S. are equally as damaging to the environment as GHG emissions inside the U.S., companies should initially be required to report only national emissions due to the perceived difficulty in measuring GHG emissions abroad. However, this exclusion does raise the concern that companies may move energy-intensive processes offshore to less GHG-regulated countries so that their reported domestic emissions will decrease. Despite this concern, it will be too difficult to monitor and audit the GHG emissions reported abroad. In addition, substantial confusion may be created as to which foreign operations to report and which to exclude—a question which may not be clear even in the domestic context and will be discussed below. However, foreign emissions by U.S. companies may be accounted for under other regulations in the jurisdiction where the operations are located, especially in a world where most industrialized and many developing countries are parties to the Kyoto Protocol, which places a cap on their nationwide GHG emissions, and are employing or starting to employ GHG regulations. Thus, such emissions that are not covered under this reporting regime may be subject to scrutiny in the foreign jurisdiction where the emitting source is located.

Another issue in determining which emissions the company is responsible for is in determining which facilities the company is responsible for. The clearest method would be for each firm to only include emissions from facilities for which it is accountable in its financial statements. However, this may not accurately reflect the total scope of emissions for which the company should be held accountable. There are many types of ownership structures where the company has subsidiaries and other sub-entities that are not wholly owned or are involved in complex joint ventures. For such ownership structures, the company should include the GHG emissions of the partly owned entity that corresponds to the percentage of ownership. A more difficult issue is whether to include emissions from leased facilities over which the company

has no ownership. When it is clear that a leased facility operates primarily for the benefit of the company, such as processing raw materials which will be used in the company's end product, and where the lessor company has control in terms of the operation of the facility, the GHG emissions should be included in the lessor company's GHG inventory. The lessor company should be held accountable for the facility's emissions because it has substantial power to negotiate and control the operation of such facilities to meet emission requirements.

Concerns of double counting between the contracted or leased facility are not significant if there is consistency in including the emissions each year in a company's GHG inventory. The purpose of the reporting mechanism is not to aggregate all the reporting numbers to come up with a bottom-up GHG emissions number, but to provide companies with a regulatory mechanism to track their emissions and compare them to those of peer companies.

Other companies may rely extensively on outsourcing through their supply chain and sell products that are made through heavy GHG emitting processes, which they do not directly own or lease. Despite the significant control that big purchaser companies may have over their relatively small suppliers, the GHG emitted throughout the supply chain should not be included in the company's overall GHG emissions. Not only would it be administratively difficult for companies to account for and verify the emissions throughout their supply chain, the boundaries as to how far in the supply chain the big companies should be held accountable for are murky. However, companies should be encouraged to cooperate with their suppliers to become more energy efficient and reduce GHG output; thus, the annual GHG reporting form will allow companies to elaborate on such supply chain efforts. If big customers demand environmental performance as a condition for continuing to buy, small suppliers with serious competitors have an obvious incentive to accede to such demands.[62] Big corporations will become accountable for their supply chains not by including the emissions in their annual reporting but through the reputation created by proactively engaging in their activities to create greener relationships with their supply chain.[63]

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[62] Coglianese & Nash, *supra* note 12, at 185.

[63] *See* Claudia H. Deutsch, *For Suppliers, the Pressure is On*, N.Y. TIMES,

Another question relates to assessing the energy-efficiencies of the manufactured product and whether to reflect this in the total GHG emissions. For example, refrigerator manufacturers may be able to reduce more GHGs by producing more energy efficient appliances than by cutting down on their own emissions in the manufacturing process.[64] However, it is difficult to quantify this data and incorporate it into the firm's GHG emissions. There should instead be a reporting section that allows companies to describe such GHG reduction efforts that occur not on the production side, but on the consumer consumption side. Furthermore, better marketing opportunities and increased consumer perception may lead consumers to prefer products with higher energy efficiency so that companies will continue to have the incentive to manufacture more energy efficient products even though this effort may not be reflected in a reduced GHG emissions number.

(2) *How Should the Emissions Be Measured?*

The second question is the measurement of the emissions. All companies within the scope of the requirement should report their GHG emissions according to the GHG Protocol developed by the WRI and the WBCSD. "The GHG Protocol is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions."[65] It provides the accounting framework for many different GHG standards and programs in the world, including the Carbon Disclosure Project, the EPA Climate Leaders, and the Climate Registry. The GHG Protocol takes into account the direct emissions that come from stationary and mobile combustion sources and the indirect emissions that come from the purchase and use of electricity, steam, and hot and cold water. Direct emissions of most GHGs, particularly CO_2 from combustion, the largest source of emissions, are easily estimated indirectly. "When

Nov. 7, 2007, *available at* http://www.nytimes.com/2007/11/07/business/businessspecial3/07Supply.html?_r=1&scp=1&sq=For%20Suppliers,%20the%20Pressure%20is%20On&st=cse&oref=slogin.

[64] *See* LORETI ET AL., *supra* note 54, at 30.

[65] THE GREENHOUSE GAS PROTOCOL: A CORPORATE ACCOUNTING AND REPORTING STANDARD 1 (World Business Council for Sustainable Development & World Resources Institute eds. 2004), http://www.ghgprotocol.org/ (last visited Dec. 20, 2007).

fossil fuels are combusted, the amount of CO_2 released is directly proportional to the amount of carbon in the fuel."[66] Therefore, the amount of GHGs released can be calculated by knowing the following three things: "the amount of fuel burned, the carbon content of the fuel, and the fraction of the carbon in the fuel that is converted into CO_2."[67]

The reason for including the indirect emissions coming from purchased energy is to understand the entire carbon footprint of firms that do not emit GHGs themselves, but nevertheless use energy that requires utilities to emit GHGs. Firms have a large degree of control over the amount of consumption from these energy sources, the energy efficiency of their own processes, and the choice of their electricity supplier.[68] As companies have greater choice and control over their decisions regarding electricity and other energy supplies due to energy market reforms, energy supply decisions could be used to demonstrate how environmentally responsible they are. Obtaining the information necessary to calculate might be unclear and obtaining this information would likely require the cooperation of the electric utility. However, if the utility itself were required to report this, then this information would be easily obtainable. In addition, as a default, the DOE's Voluntary Reporting of Greenhouse Gases Program lists state-averaged GHG emissions factors for electricity consumption.[69]

However, this does raise the question of double counting as the electricity producer and consumer both would report the emissions as their own.[70] Taking into account that the purpose of a mandatory reporting program is not to create a bottom-up inventory, but to analyze individual corporate emissions respective to their industries, this does not seem to be a significant problem.[71]

In addition to including direct and indirect GHG emissions, there should be an allowance for carbon sequestration. Thus, the amount of carbon captured and sequestered should be subtracted from the total emissions amount. Especially "for companies in biomass-based industries, such as the forest products industry, some of the most significant aspects of a company's overall impact

[66] LORETI ET AL., *supra* note 54, at 18.
[67] *Id.*
[68] *Id.* at 28.
[69] *Id.* at 31.
[70] *See id.* at 29.
[71] *See id.* at 31.

on atmospheric CO_2 levels will occur as a result of impacts on sequestered carbon."[72] Some forest product companies such as Georgia Pacific have started to introduce the concept of carbon sequestration in measuring their GHG footprint.[73] However, an accounting standard for sequestered carbon in the context of the GHG Protocol Corporate Standard has not yet been developed.

(3) *How Should the Firm Determine the Baseline Emissions?*

A third issue is the determining of the baseline. A baseline must be established so that the company can make internal analyses as to how much GHG emissions reductions they are accomplishing compared to previous years. This does not necessarily mean that companies that have already engaged in significant voluntary reductions do not get the benefit of their reduction efforts. Even though this may create fewer future GHG reduction opportunities, such companies will have a smaller carbon footprint than others in their field and thus, they will be getting credit as such efforts will already be incorporated. However, this issue is not as simple as it may seem as a company does not remain stagnant, but acquires new entities and facilities and divests others. Such acquisitions and divestitures will naturally impact the GHG emission levels. In order to take into account these corporate activities, the baseline should be adjusted to take this into account by adding or subtracting the emissions from the acquired or divested operations.[74] This will eliminate the artificial increase or decrease of GHG emissions that an acquisition or divestiture will create.

(4) *How Can Emissions Be Meaningfully Compared?*

The fourth issue is determining effective benchmarks and creating a regime that allows comparisons between firms within the same industry. Competitive pressure among firms within an industry can only be leveraged if the reported numbers are easily comparable so that firms can be filed in a straight line to determine who the best and worst performers are. Much of the external pressure stems from this comparison as it provides public interest groups, consumers, investors, and other stakeholders with the

[72] THE GREENHOUSE GAS PROTOCOL, *supra* note 65, at 88.
[73] *Id.*
[74] *See* LORETI ET AL., *supra* note 54, at 26.

context to determine who to punish and who to laud. In order for a meaningful comparison to exist, a normalization approach must be adopted. This not only allows comparison among companies but also allows comparison within the company. Companies that are growing rapidly and increasing production or acquiring new facilities will have increased GHG emissions. A normalization measurement can determine whether there was an absolute growth in emissions intensity. This approach must be different for each industry, especially between energy intensive manufacturing industries and commercial industries. One good example is outlined in the Technical Guidelines issued for the DOE's Voluntary Reporting of Greenhouse Gases Program (Technical Guidelines).[75] The Technical Guidelines take each industry by North American Industry Classification System (NAICS) code and determine the physical output units that should be used to normalize the GHG emissions amount. For example, crop production and mining are normalized in metric tons, utilities in kilowatt-hours and revenues, textile product mills in square yards, petroleum and coal products manufacturing in millions of barrels per day, computer manufacturing in units by type, securities and other financial investment activities in square feet of building space, and professional services by square feet of building space or number of employees.[76] This normalization methodology provides a measure of comparison between peer companies and provides an internal measurement of carbon intensity.

C. *Program Scope*

The program's scope should be limited to companies that would not be highly burdened by the cost of annual measuring and reporting. Therefore, there should be an exemption for small businesses,[77] if they emit fewer than 10,000 carbon dioxide equivalents annually.

In addition to reporting annual emissions numbers, companies should be required to report their short-term and long-term emission reduction targets, identify the risks and opportunities that climate change presents, and articulate strategies that the company

[75] DEPT. OF ENERGY, TECHNICAL GUIDELINES FOR THE VOLUNTARY REPORTING OF GREENHOUSE GASES (1605(B)) PROGRAM 271–72 (2007).

[76] *See* Appendix I.

[77] Small business is described in Small Business Size Regulations, 13 C.F.R. § 121 (2008).

is undertaking or planning to undertake to meet the reduction targets and/or manage the risks and opportunities identified. These strategies should include not only corporate initiatives to reduce firm GHG emissions, but also initiatives to reduce emissions within the supply chain, efforts to produce consumer products which are more energy efficient, and other corporate actions which will ultimately reduce the amount of GHGs emitted. Each subsequent report should provide a self-assessment of the implementation of these strategies and a detailed analysis of how targets were or were not reached. An example of the report can be found in Appendix II.

Each company report should be made publicly accessible through the internet in an easily searchable format. In addition, an aggregate report of the data by industry should be compiled and published annually so that companies, the public, and all relevant stakeholders will be able to properly analyze each company's carbon footprint and how well it is doing in comparison to other companies in its industry. This will provide the basis for the development of a forum for best-practice sharing among companies as certain firms are highlighted as being carbon-friendly, energy-efficient, or innovative in using renewable energy. On the other hand, this will also highlight the companies that are doing poorly in reducing GHG emissions and may act as a catalyst in encouraging such companies to implement strategies to curtail their GHG emissions and develop climate change-friendly practices.

D. *Enforcement Mechanisms*

The enforcement mechanism under this regulation is to ensure that all companies report and not necessarily to ensure that all companies reduce their GHG emissions. This mandatory information disclosure requirement should be enforced by imposing sanctions for failure to report or for fraudulent reporting. First, the government agency in charge of compiling the information should initiate the sanctions as the agency is in the best position to determine whether or not a company has submitted its report. There is little regulatory burden for the agency to determine which companies have not reported. In addition, while compiling data within industries and analyzing emission levels between different companies within the same industry, the agency would have the most expertise in determining whether or not a

particular company was reporting fraudulent numbers.

However, except in extreme cases, the agency would have difficulty in determining this without direct audits. Creating a citizen suit provision as in the Emergency Planning and Community Right-to-Know Act[78] will not be an easy answer to increase detection of disclosure violations as it will be difficult for individuals to allege injury-in-fact, causation, and redressability to establish constitutional standing to bring suit.[79] Not only will it be difficult for individuals to allege standing, but it is unlikely that individuals will have knowledge of such disclosure violations. The parties that would most likely be able to expose fraudulent reporting are employees of the firm. Therefore, the regulation should provide for a whistleblower protection provision to protect employees from retaliatory action for notifying or assisting the agency in conducting an investigation of the firm's compliance with the reporting requirements.[80]

E. *Countervailing Arguments Against a Mandatory Program*

An argument against mandatory disclosure may be that the goals of mandatory disclosure may be achieved through the current voluntary reporting systems over time. With more and more companies participating in voluntary programs, other companies that are not participants may be pressured to participate and this would, in effect, force reporting. However, the concern with using voluntary programs to grow through inertia is that a significant amount of time may be necessary to get the ball rolling fast enough so that all companies will feel the pressure to participate. Climate

[78] 42 U.S.C. § 11046 (2000); *see* Del. Valley Toxics Coalition v. Kurz-Hastings, Inc., 813 F. Supp. 1132, 1139–40 (E.D. Pa. 1993) (stating that the statute was intended to protect a right to know regarding release of toxic materials to the environment and thus "persons experiencing such a loss of information may be found to have suffered a concrete and particularized invasion of their legally protected interests," which is a cognizable injury-in-fact).

[79] *See* Lujan v. Defenders of Wildlife, 504 U.S. 555 (1992) (holding that a group of environmental organizations did not suffer injury-in-fact and that a citizen suit provision did not confer on "all persons an abstract, self-contained, non-instrumental right" unless the plaintiff suffered a tangible and particular harm).

[80] Many federal environmental laws have whistleblower provisions, including the Clean Air Act, 42 USC § 7622, the Safe Drinking Water Act, 42 USC § 300j-9(i), the Toxic Substances Control Act, 15 USC § 2622, and the Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC § 9610.

change is an urgent issue where immediate action is necessary and waiting for voluntary programs to gain enough momentum so that all companies will voluntarily participate is not a viable option.[81] In a voluntary system, there is no enforcement mechanism or sanction mechanism to punish those that not only fail to report but also those that report fraudulent numbers. In a voluntary system where the goal of a company may be recognition for participation, many companies may choose to report cursory figures without employing strict GHG Protocol methodology, as there is no sanction or liability for failure to do so.

In addition, it may be argued that GHG accounting is a heavy cost burden on the company. Thus, such a regulation as proposed above would favor big companies that have the resources and technical expertise to measure GHG emissions but disadvantage smaller companies that do not possess such resources. The companies that are already participating in the voluntary GHG emissions reporting programs have a cost advantage if this regulation is implemented, as they would already have incurred the initial investment costs of setting up a GHG accounting and management system. Although I concede that initially introducing GHG accounting to a firm will incur costs of measuring and monitoring GHG emissions, these costs should be compared against the energy efficiency measures that may reduce the operating costs of the company. Moreover, taking a broader long-term view and accepting the scientific evidence recently published by the Intergovernmental Panel on Climate Change, no company is immune from the risks that climate change imposes.[82] If this activity goes unchecked and unmonitored, then the tragedy of the commons problem will continue until the costs to society and to each individual actor becomes too great. It is imperative that measures be taken to reduce GHG emissions and government should hold companies accountable for the amount of GHG that is emitted through their own activities. Thus, the cost of implementing a GHG accounting and management system should be offset against the potential long-term liabilities that may occur if companies fail to take any action in curbing GHG emissions.

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[81] *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 6.

[82] *See id.*

CONCLUSION

GHG reduction is a goal that all carbon-emitting entities must acknowledge given the scientific reports on the risks of climate change. The first step that companies must take to effectively reduce their GHG emissions is to accurately measure their carbon footprint and assess the potential room for reduction. However, without a mandatory disclosure regulation, companies may not invest in the GHG accounting and management systems necessary to accurately measure their GHG emissions. By forcing companies to measure and report their GHG emissions, government can open the eyes of internal management to the current state of their company's emissions level and the risks and opportunities that it provides. In addition, by disclosing the information to the public and the relevant stakeholders, companies themselves will be encouraged to reduce their emissions to maintain a more climate-friendly reputation. Not only will public disclosure put external pressure on firms, it will also provide the data for firms to analyze their GHG emissions against their peer firms in the same industry, fostering competition to avoid being the "top GHG emitter." Therefore, a mandatory information disclosure regime must be implemented to create these pressures for companies to self-regulate.

APPENDIX I

Output Measures for Reporting Greenhouse Gas Emission Intensity under the Department of Energy Section 1605(b) Voluntary Reporting of Greenhouse Gases Program

NAICS Code Nos.	Description	Physical Units
111	Crop production	Metric tons
113	Forestry and logging	Acres
212	Mining (Except oil and gas)	Metric tons
221	Utilities	Kilowatt-hours, revenues ($)
311	Food manufacturing	Short tons, metric tons, lbs, kgs, sacks (flour), bushels (wheat), kilolitres
313	Textile mills	1,000 lbs, million hours (spindle), bales (cotton), square yards (fabrics), lbs (tie cord)
314	Textile product mills	Square yards, dozens
321	Wood product manufacturing	Billion board feet, cubic meters
322	Paper manufacturing	Short tons, metric tons
323	Printing and related support manufacturing	Square meters
324	Chemical manufacturing	Million barrels per day
325	Plastics and rubber products manufacturing	Short tons, metric tons, gallons, cu ft
326	Nonmetallic mineral product manufacturing	Metric tons
327	Primary	Billion square feet, short tons, metric tons, tons (clinker), kilograms, million dozen (tumblers, cookware, stemware), million pieces (tableware), 1,000 bricks, square meters (wall tile)

331	Primary metal manufacturing	Million tons by metal smelted
332	Fabricated metal product manufacturing	Million tons by metal, 1,000 units by type
333	Machinery manufacturing	Units by type, units by fuel
334	Computer and electronic product manufacturing	Units by type, square meters of silicon
335	Electrical equipment, appliance, and component manufacturing	Units by type, 1,000 lbs gross (by type of material), 1,000 units (if product type does not change substantially over time)
336	Transportation equipment manufacturing	Units by type (cars, trucks), vehicle
337	Furniture and related product manufacturing	Units by type
339	Miscellaneous manufacturing	Units by type
442	Furniture and home furnishing stores	Units by type
486	Pipeline transportation	Barrels of throughput
51	Information	Employees, square feet of building space
523	Securities, commodity contracts and other financial investments and related activities	Square feet of building space
531	Real estate	Square feet of building space; number of apartments or residential units
541	Professional, scientific, and technical services	Square feet of building space, employees
562	Waste management and remediation services	Tons waste processed
611	Educational services	Student enrollment, faculty employment
62	Health care and social assistance	Beds, square feet
812	Personal and laundry services	Laundry cleaned (lbs), employees

APPENDIX II

Annual GHG Emissions Reporting Form[83]

1. *Total Emissions*

A. Emissions from Facilities under Direct Control

Annual CO_2 Equivalent (metric tons)	Base Year	Year 2	Year 3	Year 4
Direct Emissions Total				
Stationary Combustion Sources				
Mobile Combustion Sources				
Refrigeration / AC Equipment Use				
Process / Fugitive (Identify Source)				
Indirect Emissions Total				
Purchased and Used Electricity				
Purchased and Used Steam				
Purchased and Used Hot/Chilled Water				

[83] The Climate Leaders Program and the Carbon Disclosure Project provide examples. *See* BASIC INFORMATION, CLIMATE LEADERS, *supra* note 32; CARBON DISCLOSURE PROJECT, *supra* note 45.

B. Emissions from Facilities Under Indirect Control (Partially Owned Subsidiaries, Leased or Contracted Facilities Operating Primarily for the Benefit of Company)

Annual CO_2 equivalent (metric tons)	Base Year[84]	Year 2	Year 3	Year 4
Direct Emissions Total				
Stationary combustion sources				
Mobile combustion sources				
Refrigeration / AC equipment use				
Process / Fugitive (identify source)				
Indirect Emissions Total				
Purchased and used electricity				
Purchased and used steam				
Purchased and used hot/chilled water				

C. Sequestration

D. Total Emissions = A + B - C

E. Carbon Intensity = (A + B - C) / units

2. *Climate Change Strategy*

A. Identify the short-term and long-term emission reduction targets

B. Identify the risks and opportunities that climate change presents

C. Identify strategies that the company is undertaking or planning to undertake to meet the reduction targets and/or manage the risks and opportunities identified.

[84] Acquisitions and divestitures must be reflected in base year amounts.

D. Identify

(1) Corporate initiatives that reduced the GHG emissions of suppliers in the supply chain

(2) New products that use less than 90 percent of the energy of existing products (either of a competitor's or of the company's products)

(3) Other corporate initiatives that significantly impact the overall GHG carbon footprint