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Focus Report

Responsible Care Redux

One industry that is very sensitive to environmental, health, and safety issues, having had its share of bad press since the days of the Bhopal (India) gas release in 1984 killed an estimated 3,800 people, is the chemical industry. In 1988, the then Chemical Management Association (CMA), following the 1987 lead of its Canadian counterpart, the Canadian Chemicals Producers Association (CCPA), ushered in its version of the Responsible Care principles for use by member chemical companies. Since then, CMA has become the American Chemistry Council (ACC), and Responsible Care has added another dimension with the issuance of RC 14001, a sister standard to ISO 14001, complete with certification provided by accredited certification bodies.

As reported in *Chemical Week* (13 July 2009), Responsible Care continues to evolve with a new global product stewardship push, as well as the addition of sustainability to the program’s Canadian codes. Responsible Care will provide the foundation for the industry’s global advocacy efforts. This visibility also gives the chemical sector an opportunity to interact with policy makers as they discuss the implementation of new environmental, health, safety, and security initiatives. The growing global interest in issues associated with climate change, security, and chemicals management has been the impetus for voluntary national and international initiatives to be revisited for possible expansion and revision.

“Responsible Care has provided the US industry with a solid underpinning for domestic advocacy efforts,” says Greg Wilkinson, vice president for government affairs, Nova Chemicals. “One of the challenges ahead of industry is management of the overall Responsible Care brand as we approach international organizations with our advocacy efforts.”

At the ACC’s 2009 meeting, industry leaders said that it is also a priority to extend Responsible Care globally, especially in emerging markets, such as China, Russia, and the Middle East. ACC vice chairman Brian Ferguson told attendees, “Even responsible companies can be tainted by the errors of other players in the global chemical industry. ... Chemical contamination in baby formula or pet food in China is not viewed as merely a ‘Chinese problem.’ It is viewed as evidence of the danger of chemicals anywhere in the world. ... We need to reach out directly to our counterparts in emerging economies and help them build the systems, procedures, and expertise they need to operate at the same safe levels that we do.”

With respect to transparency and accountability, industry executives are advocating some changes within the industry. The International Council of Chemical Association’s (ICCA, www.icca-chem.org) Global Product Strategy (GPS) is one such tool. The GPS is designed to improve the global chemical industry’s product stewardship performance by recommending measures to be taken by companies, working together with their chemical associations, and in cooperation with activities of other companies and associations along the chemical value chain. Key components include guidelines for product stewardship, including ways to make relevant product stewardship information more transparent, and a tiered process for completing risk characterization and risk management actions for chemicals in commerce, among others.

“The Global Product Strategy represents an acceleration of industry efforts to implement product stewardship globally, particularly for the developing world,” says Greg Bond, Corporate Director of Product Responsibility at The Dow Chemical Company (Dow) and co-chair of ICCA’s chemical policy and

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<http://hr.cch.com>

health leadership group. Bond adds, “One of the reasons there is so much concern about chemicals in products is that for many years the chemical industry was doing these assessments in a black box. A lot of the effort now is about opening that box and kicking up the level of transparency around what we know and about risk and how we manage chemicals.”

Dow, sold on GPS, plans to lead in this effort by example: all of the company’s high-priority products will be assessed by 2010, and all of its products will be assessed by the end of 2015.

On a larger scale, GPS plays a key role in the chemical industry’s participation in an industry policy, the Strategic Approach to International Chemicals Management (SAICM, www.saicm.org). SAICM is a chemical industry policy framework to promote chemical safety around the globe, with a goal of ensuring the sustainable management of chemicals by 2020 such that chemicals are used and produced in ways that will minimize significant adverse impacts on human health and the environment.

At present, the real test of how the chemical industry responds will come from the CCPA as it re-drafts its Responsible Care codes with sustainability as the core issue to address. Canada’s Responsible Care program is not currently designed to address emerging concerns, such as climate change, inherently safer technologies, corporate social responsibility, and business ethics. CCPA vice president Brian Wastle explained

that CCPA board members had pressed for Canada to take the lead on pushing Responsible Care more toward sustainability. He added, “We felt the need to establish Canada again as the leading edge.”

There is much at stake with the CCPA experiment; depending on how the initiative is received by stakeholders, it could easily become an example that other associations follow — or avoid. Wastle said, “[The ICCA and other trade associations] probably see us as a nice test market.”

Not alone in this area, SOCMA’s (the Society of Chemical Manufacturers & Affiliates, www.socma.com) ChemStewards program also feels that change is in order. In fact, smaller US companies view ChemStewards as a more effective way to document that measures are in place to manage environmental, health, safety, and security programs, according to SOCMA’s president, Joe Acker. “ChemStewards appeals to smaller firms because it is more flexible than Responsible Care. Seventy percent of our members have sales of less than US \$60 million per year. However, firms still want a program that is third-party certified, to demonstrate to regulators and others that management systems are in place. ChemStewards offers three levels of compliance, and companies can choose between basic, enhanced and excellent tiers,” Acker noted.

For additional information, see www.chemicalweek.com/sections/cover_story/Responsible-Care_20107.html. ■

Perspectives

Expired Medication Takeback Programs Expand (Conclusion)

As we reported last month, the lack of consistent and effective direction at the federal level has led some US pharmacies to develop their own programs to keep medications out of traditional waste treatment streams that may affect surface or ground water. This month, we highlight two more pharmacies that are trying to “do the right thing,” both for their customers and for the environment: Good Day Pharmacy, a chain in Colorado, and Eaton Apothecary, a small chain in Massachusetts.

Good Day Pharmacy

Karen Price, Director of Marketing, and Vicki Einhellig, Chief Operating Officer, of the Good Day Pharmacy chain explained their takeback program and how it evolved. Customers had been asking for years what to do with their expired drugs, and, after seeing recurring stories about the topic in the news, the pharmacy chain decided it was time to do something about the problem. The program was “officially” launched in fall 2008, in collaboration with Home Instead Senior Care. The event, dubbed Operation Medicine Cabinet, took place in the parking lot of Sunflower Farmer’s Market in Fort Collins, Colorado. Price noted, “The purpose of Operation Medicine Cabinet is to remove unsafe and ineffective [expired] medicines from the homes in the communities we serve, while disposing of them in an environmentally friendly manner.”

As this was their first event, the organizers had no idea how much material they would collect. Mike Maguire, owner of Home Instead, said, “At the end of the event, we were astounded to find out we had collected about 200 pounds.” The mix of items collected included unused pills and capsules, creams, inhalers, bottles of various liquids, and other medicinal items.

The Larimer County Drug Task Force took the medications for incineration. The 50 pounds of prescription vials and medicine bottles that were collected were taken to the local hazardous waste collection facility for recycling, rather than being incinerated, a plus for the environment.

According to Einhellig, the pharmacy chain plans to continue this program for unwanted medications, with the exception of sharps [syringes] and controlled substances. Price explained, “The [US Drug Enforcement Agency, DEA] ... prohibits us from taking back controlled substances and many of the meds people want to dispose of fall under this classification.”

On average, the in-store takeback program at 11 Good Day Pharmacy stores collects about 20 pounds of unused medications per week, or around 5 tons per year. A reverse distributor then transports the medications to a US Environmental Protection Agency (EPA)-approved treatment facility for incineration.

Eaton Apothecary

Eaton Apothecary held its third takeback event at its Wellesley, Massachusetts (USA) location on 17 October 2009. The event was given a boost from a local news station's story about unwanted medications and their negative impacts due to misuse and abuse, the detrimental effects of improper disposal on local waterways, and other health and environmental issues. That story aired locally a few days before the event, resulting in larger-than-expected foot traffic and volume of medications. (See www.thebostonchannel.com/health/21308122/detail.html.) One patron commented that he had found out about the event from the news clip, saying, "I didn't know what to do with these drugs that I had stored for over two years at home. Thank you for making my decision easier."

Sophie McIntyre, the program's co-manager, commented, "It's been busier this time, we collected more drugs ... very smooth, better organized." Marie Crognale, the other program co-manager, added, "This time the program went more smoothly because we had more people inputting ... which made the whole event go off without a hitch."

The popularity of medication takebacks spurred a Natick, Massachusetts Town Official and Registered Pharmacist to learn more by participating in the event and seeing first-hand how it works. Her intent was to gather information for Natick's proposed "Healthy Communities" Project. When asked about the program, she explained, "The name implies what it

plans to do — [prescription] takeback is a safe and legal way to dispose of unwanted medications in conjunction with solid waste recycling."

The Wellesley event surpassed expectations, tipping in at 300 pounds of non-controlled substances. In addition, the pharmacy collected about 200 pounds of miscellaneous substances, including sharps, mercury and aerosol products, and controlled substances, totaling about 500 pounds of material shipped offsite to a federally licensed incineration facility.

Eaton continues to bear all costs associated with each takeback event, from police detail to waste transport to final witness burn of the medications, averaging about US \$2,000 per event. The pharmacy receives no grants for their efforts, just the assistance of volunteer pharmacy students who receive extra credit for their work.

Lessons Learned

Anecdotal information culled from the pharmacies' programs points to a number of observations and recommendations:

- The regulatory body with primacy for medications, including their disposal, is the DEA. It would be helpful if DEA would provide an allowance for pharmacies that wish to initiate takeback programs for all medications, including controlled substances, without the added financial burden currently imposed, such as the costs associated with police presence at some events and witnessed burns for the controlled substances.

- Pharmaceutical companies, through their distributors, should hammer out a takeback/disposal program for some unwanted medications, thus lessening the financial burden on pharmacies. This aspect has appeared on the radar screen of at least one local government association, providing some future support at the local level.
- State health regulatory bodies should take a closer look at this emerging issue and consider developing guidance for future takeback programs.
- EPA should consider either funding a pilot takeback program and seek pharmacies to volunteer for it, or provide grants that pharmacies could apply for to help offset costs.
- Publicly owned municipal wastewater treatment works should also take a closer look at how medications can be treated so as not to adversely affect downstream water users.
- Pharmacies that want to include sharps in their programs should consider providing

general safety awareness training for staff at these events.

The growing number of pharmacies and their customers inquiring about safe disposal of unwanted medications should be a wake-up call that the federal agencies whose jurisdictions overlap in this area should consider some type of shared responsibility, or at least craft consistent guidance for any pharmacy that wants to initiate a program to clean up our waterways one pill at a time.

Additional information can be found in *Drug Topics* at: <http://drugtopics.modernmedicine.com/drugtopics/Modern+Medicine+Feature+Articles/Pharmacies-strive-to-become-eco-friendly-and-energ/ArticleStandard/Article/detail/607939>. ■

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Corporate Reporting

ASB Criticizes Clutter

The United Kingdom's Accounting Standards Board (ASB) has published a report that decries unnecessary clutter in the corporate social responsibility (CSR) section of annual business reports. ASB's report, "Rising

to the Challenge: A Review of Narrative Reporting by UK Companies" evaluated 50 UK companies' annual reports for content, communication, and clutter. The ASB's goal is to promote confidence in corporate reporting and governance.

ASB does not question the importance of sustainability. It's concern is that much of the information included in CSR sections is "not material to understanding a company's performance and position." According to the report, "only 20% of the sample provided a convincing explanation of why CSR is important to their business." Though businesses experience social pressure to report, ASB suggests it would be better for companies to say, "we have no material social issues," rather than to add irrelevant content to their annual reports.

ASB also suggests that the irrelevant content could stem from a lack of clarity in reporting requirements. Current UK regulations require an explanation of employee, environment, and social or community issues. Companies often attempt to address all three, including information that is not essential for making resource allocation decisions. "We must consider whether further reporting requirements ... will succeed in changing company behavior or just in adding clutter to an already lengthy annual report," says ASB. ASB says that it welcomes the UK government's 2010 plan to review whether greenhouse gas emissions reporting is actually impacting climate change.

"The ASB is ... encouraging companies to focus on those CSR issues that genuinely drive their business," said Paul Scott, managing director of CSR-resource CorporateRegister.com. "In the absence of anything substantial to report but under the pressure of wanting to be seen to report something, the insubstantial and immaterial creep in."

For more information, see www.thecrossbordergroup.com/pages/1913/Breaking+news.stm?article_id=13689; www.frc.org.uk/images/uploaded/documents/Rising%20to%20the%20challenge%20October%202009.pdf; www.frc.org.uk/asb; and www.frc.org.uk/images/uploaded/documents/Full%20results%20of%20a%20Review%20of%20narrative%20reporting1.pdf. ■

GRI Asks "Why Report?"

The Global Reporting Initiative (GRI) is asking organizations to weigh in on why they issue corporate social responsibility (CSR) reports. GRI wants to know what the objectives are, who is being targeted as an audience, and what metrics are being used to measure reports' effectiveness. The survey is being conducted in conjunction with the second annual GRI Readers' Choice Awards.

A report based on the results from both the Readers' and Reporters' Surveys will provide insights into whether reports meet the needs of their target audiences, and whether reports actually change people's views and behavior. Helen Spoor, Consultant at Readers' Choice Awards Communications Partner Futerra, explained: "Trust is at an all time low. By showing both sides of the story, we are being completely transparent. Results could show a real disconnect between reporters and readers, providing the opportunity to dramatically change sustainability reporting in the future."

The awards and survey results will be announced at the 2010 Amsterdam Global Conference on Sustainability and

Transparency, to be held 26–28 May 2010. GRI welcomes any organization that has issued a sustainability report in 2008 or 2009 to take part.

For more information, see www.prlog.org/10420169-why-do-companies-issue-sustainability-reports-gri-invites-companies-to-have-their-say.html. ■

Corporate Initiatives

World Bank Green Bonds

The World Bank (the International Bank for Reconstruction and Development, IBRD), in partnership with SEB, one of Sweden’s leading commercial banks, and several key Scandinavian institutional investors, has launched a “World Bank Green Bond” to raise funds for climate change mitigation projects. The bond is an example of the innovative efforts the World Bank is fostering within its Strategic Framework for Development and Climate Change, launched in 2008 to help stimulate public and private sector activity in this area. The World Bank will credit the proceeds to a special account from which loan disbursements will be made to qualifying “green” projects in its member countries.

Annika Falkengren, President and CEO, SEB, said, “With this issue we have been able to offer our clients a product through which they can accomplish three things: take a stand towards fighting global warming, support the World Bank and its members in their efforts to fight poverty, and secure a higher return than government securities by investing in the World Bank’s Aaa/AAA-rated bonds.” Robert Zoelick, President of the World Bank Group, noted, “Tackling climate change is going to take

immense resources that will only come from a well-orchestrated flow of public and private finance. This ... is an important early effort to show one way in which this can be done.”

Answering the World Bank’s call, the state of California (USA) recently purchased US \$300 million of World Bank Green Bonds as part of the state’s commitment to climate change mitigation. Bill Lockyear, California State Treasurer, said, “This is a landmark investment — our first in global climate change solutions. ... And it tells the world that when it comes to battling climate change, California is prepared to contribute not just its policies, but its money, too.” World Bank Treasurer Kenneth Lay commented, “We’re very pleased ... with the confidence [California] is showing in the quality and liquidity of World Bank bonds as a means [to meet the climate change challenge].”

In response to a *BATE* inquiry, an SEB spokesperson explained that SEB approached the World Bank regarding a green bond program. SEB needed to develop a product that would suit its investors’ needs. The development took one year to complete. SEB’s approach included:

- First, make it a simple instrument, so that the “green” allocation gets in focus, instead of the “structure” of the bond. With the bonds issued under the known issuing facility from the World Bank (the Global Note Program), the vast majority of investors have the technicalities in place to buy the issue.
- Second, ensure that a green element is secured for the issue; to that end, the World Bank implemented a screening function based on a number of factors.
- Third, distribute the bonds based on the infrastructure of the clients, which is a tailor-made process.

For additional information about SEB and on the World Bank Green Bonds, see www.sebgroup.com and <http://treasury.worldbank.org/newsinvestors>. ■

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Trader Joe’s Flunks Seafood Sustainability Scorecard

Greenpeace has rated the US grocery chain Trader Joe’s last of the national chains on its third annual “Carting Away the Oceans” scorecard. The scorecard assessed and ranked the top 20 US grocery chains on their green seafood credentials. Greenpeace is urging consumers to buy from stores that are trying to minimize their impact on the oceans by selling sustainably farmed or caught fish.

Wegman’s, Ahold USA, Whole Foods, and Target were commended for doing the best job, while Safeway, Harris Teeter, and Wal-Mart received acceptable marks. According to Greenpeace, these stores have all made strides toward responsible seafood buying and selling.

Greenpeace listed nine grocery chains, including national and regional chains, as doing little to sustain the oceans. Trader Joe’s was last among national chains, although three regional chains ranked even lower. The organization said that Trader Joe’s has no apparent plan to assure it is buying reputedly fished and farmed seafood, and sells “red listed” fish that are endangered by overfishing or habitat loss, such as orange roughy. Greenpeace claims that the chain is not affiliated with any conservation groups, has no discernible seafood policy to reduce environmental harm, and that signs posted in some stores suggesting that its seafood is environmentally friendly appear to be mere marketing ploys.

In conjunction with the scorecard’s release, Greenpeace members, two of whom dressed as bright orange fish, demonstrated outside Trader Joe’s stores in San Francisco, California (USA), handing out information on why it’s important to select and buy seafood that can be replenished. To drive home its point, Greenpeace also opened a Web site, called “Traitor Joe’s,” that further explains Greenpeace’s seafood campaign.

For more information, see www.greenrightnow.com/kabc/2009/07/03/greenpeace-zings-trader-joes-for-being-last-on-seafood-sustainability-list/. ■

Sunshine From Sahara to Power Europe?

Munich Re, the world's largest re-insurance company, announced that it will head a consortium to invest US \$593 billion in the Desertec project. Other partners include Siemens, Deutsche Bank, and RWE. Desertec will install solar power plants in the North African Sunbelt in the Sahara desert. The money will finance concentrating solar thermal power (CSP) plants to produce electricity, plus electric grid upgrades. German solar industry suppliers include Flabeg and Schott Solar, with CSP systems; Siemens, with its steam generation turbines; and both MAN Ferrostaal and Solar Millennium, veteran project developers for CSP systems.

Henning Wicht, the senior director and principal analyst for photovoltaics at the

research firm iSuppli, said, "The project is set to spur a new wave of other solar power plants and projects, marking a historic shift from traditional electrical-generation techniques to solar power." Wicht continued, "iSuppli expects China will move quickly on similar projects because of its eagerness not to miss out on the future of the renewable energy business."

In a Greenpeace-sponsored study, the Wuppertal Institute of Energy judges that, by 2050, the CSP industry will have \$2 trillion in revenue and create 600,000 jobs around the world, as many jobs as there are in the German automotive industry today.

More information about the project is available via info@isuppli.com. For more, see <http://electronicdesign.com/Articles/Index.cfm?AD=1&ArticleID=21496>. ■

Product Stewardship and Takeback

New York City Law Evokes a Lawsuit

Leading electronic manufacturing trade associations responsible for a pending lawsuit opposing New York City's (New York, USA) electronic waste (e-waste) law are being pressured by 18 other states to withdraw the lawsuit and allow the law to be implemented. The lawsuit, filed in US District Court in July 2009, alleges that the April 2008 law is unconstitutional. The law requires electronic manufacturers to establish a convenient plan for consumers to recycle their used electronics. The suit was filed just one week before the deadline for electronic manufacturers to file their plans for meeting the law's requirements.

"It's unfortunate that the nation's leading manufacturers, hiding behind their trade associations, are trying to prevent this long overdue environmental program from taking effect," said Kat Sinding, Senior Attorney in the New York Urban Program at the Natural Resources Defense Council. "Recycling electronics is a sensible strategy to protect our water, air and health while providing a second life for the valuable materials these products contain."

Electronics account for the fastest growing portion of the municipal waste stream in the United States. E-waste laws around the country

seek to place the growing burden of financial responsibility for e-waste on the manufacturers themselves. The states of Oregon and Washington both implemented e-waste laws in January of this year. Both programs were deemed successful almost immediately.

Voluntary industry takeback programs have not proven to be effective. No federal takeback law currently exists, and many believe a federal plan would not be strict enough to promote necessary change. As a result, state and local laws are becoming common.

“While many of these electronics companies have voluntary recycling programs, most of them don’t actually collect significant volumes of e-waste. The exception is where strong state laws make them do it,” said Barbara Kyle, coordinator of the national Electronics TakeBack Coalition. “The industry complains about the ‘patchwork of state solutions,’ but the truth is that if their voluntary takeback programs were better, states and cities wouldn’t be passing these laws.”

For more information, see <http://eponline.com/articles/2009/11/10/18-states-ask-industry-groups-to-withdraw-n.y.-ewaste-suit.aspx>; www.computertakeback.com/legislation/lawsuit_vs_nyc/lawsuit_vs_nyc.htm; and www.nrdc.org/media/2009/090727.asp. ■

Women Lead Recycling Charge

Women are typically responsible for recycling in US homes, according to a recent survey conducted by “Plastics Make it Possible,” a Web site initiative sponsored by America’s plastic makers

through the American Chemistry Council. The November 2009 study surveyed nearly 1,000 US adults, asking them questions about their recycling habits and that of their households. The survey showed that around 70% of households make an effort to recycle at home. Of those, two-thirds rely on the female head of the household to lead the recycling efforts, another quarter share the responsibility, and around 10% put the kids in charge of household recycling. The survey also found that 82% of Americans know something about the variety of things that recycled plastic water bottles can be used to make, such as lumber, life jackets, rope, and even t-shirts.

“It’s encouraging to see that more and more Americans are making an effort to recycle at home, but there is still a huge opportunity to educate and motivate the remaining third who don’t,” said Steve Russell, vice president, Plastics Division of the American Chemistry Council. “Many plastics can be easily recycled ... and given a second life as carpet, clothing, furniture, backyard decks, new bottles and bags, and other products we use every day. By making it a practice to recycle, people can help make a difference.”

Capitalizing on the gender bias of recycling responsibility, Mimi Vert, a jewelry company known internationally, recently integrated the theme of recycling into its advertising campaign. Models are pictured participating in recycling activities while wearing Mimi Vert fashion jewelry. “It’s a new era and there is a growing awareness about the need to protect the environment,” explained Mimi Vert designer Miriam Josi. “Mimi Vert not

only wants to be part of it but also set an example, inviting others to follow.”

Recycling has become contemporary, even trendy among women. Mimi Vert is appealing to women on an issue they already care about. The company is at the very least demonstrating smart business sense.

Setting a strong example for women concerned about recycling is this year’s Goldman Environmental Prize winner, Yuyun Ismawati of Bali, Indonesia. Ismawati has implemented recycling programs in Bali that are accessible, easy, and beneficial to the community at large. Her waste management programs have the potential to reduce household waste that would otherwise end up in landfills by as much as 60%. She says the difficult part

was to get people, especially those living in the slums, to participate in responsible waste management.

“This is not only my achievement, it’s also a prize for the communities I’ve been working with, for their willingness to change their mindset,” she told reporters when accepting the international award. “It’s actually easy, and low-cost. But the will must come from them.”

For more information, see www.prnewswire.com/news-releases/when-it-comes-to-recycling-women-talk-more-trash-69986562.html; www.treehugger.com/files/2009/06/recycling-makeover.php; and www.thejakartapost.com/news/2009/05/17/women-led-recycling-initiative-wins-int%E2%80%99l-environment-prize.html. ■

ISO Update

ISO Greenhouse Gas Standards Overview

While world leaders meet in Copenhagen, Denmark to discuss a successor to the Kyoto Protocol, the International Organization for Standardization (ISO) has already developed standards that blend guidance and specific requirements to allow validation and verification bodies to assess the greenhouse gas (GHG) reduction claims of organizations. The GHG assertion process is twofold: the entity making the assertion is responsible for adhering to the requirements of the relevant GHG ISO standard, while the validation or verification body is charged

with completing an objective and impartial assessment of that entity’s assertion and documenting that assessment in a validation or verification statement, based on their independent findings. ISO 14064 and ISO 14065 show verifiers how to execute objective assessments and validation or verification statements, and also show organizations how to plan their GHG emission and removal statements to allow third-party validation and verification.

Four separate documents collectively make up the specifications and guidance for the accredited bodies. They are:

- ANSI/ISO E14064-1:2006 Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of [GHG] emissions and removals;
- ANSI/ISO E14064-2:2006 Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring, and reporting of [GHG] emission reductions or removal enhancements;
- ANSI/ISO E14064-3:2006 Greenhouse gases — Part 3: Specification with guidance for the validation and verification of [GHG] assertions; and
- ISO 14065:2007(E) Greenhouse gases — Requirements for [GHG] validation and verification bodies for use in accreditation or other forms of recognition.

ISO E14064-1 provides guidance on the selection of quantification methodologies, the actual data to be selected and collected, GHG removal factors, and the calculation of GHG emissions and removals. Part 1 also provides guidance for GHG inventory components, from reducing emissions to increasing removals, inventory quality management, and GHG report planning. Annex A provides additional guidance.

ISO E14064-2 describes the GHG project cycle, which begins with a description of the project; the identification and selection of GHG sources, sinks, and reservoirs linked to the project; the establishment of a baseline; and the establishment of procedures to quantify, monitor, and report

on GHG emissions, removals, reductions, and any enhancements to the process. Part 2 also provides considerable detail on the requirements for GHG projects, including a GHG project plan that addresses 13 specific components, data quality management, project monitoring and documentation, project validation, and project reporting.

ISO E14064-3 provides guidance on the principles and requirements that validators and verifiers need to follow as part of their responsibilities. Part 3 also describes the requirements for selecting GHG validators and verifiers, including the establishment of the level of assurance, the objectives to achieve, criteria and scope to be utilized, and how the validation/verification approach will be executed. Part 3 specifies the assessment of GHG data, information, information systems, and controls; the evaluation of GHG assertions that organizations make; and the preparation of validation/verification statements. The main body of the standard is fairly compact, with more detailed guidance included in a robust Annex A. Annex A describes the requisite skills of the validation or verification team, including when outside experts should be consulted or included in a team; the level of assurance between the team and client; project validation and verification; validation or verification criteria; a validation plan; and a complete assessment of GHG data and information.

While ISO 14064 provides requirements for organizations or persons to quantify and verify their GHG emissions, ISO 14065 specifies accreditation requirements for organizations that validate or verify resulting GHG emission assertions or

claims. The intent of GHG validation or verification, according to ISO 14065, “is to give confidence to all parties that rely upon a GHG assertion,” and to provide those entities with guidance for assessing and recognizing the competence of the bodies approved for validation and verification. ISO 14065 addresses such topics as legal status, legal and contractual matters, governance and management commitment, impartiality, competencies, communication and records, validation or verification process, appeals, complaints, special validations or verifications, and management systems.

The introduction to ISO 14065 aptly states, “Climate change has been identified as one of the greatest challenges facing nations, governments, business and citizens for the coming decades. Climate change

has implications for both human and natural systems and could lead to significant changes in resource use, production and economic activity. In response, international, regional, national and local initiatives are being developed and implemented to limit GHG concentrations in the earth’s atmosphere.” ISO has taken a bold step to craft standards that serve as a verifiable and objective measuring tool to assess organizations’ efforts to arrest the rising concentration of atmospheric GHGs. Without such a measuring vehicle, how can the populace know whether companies are being straightforward in their assertions regarding their GHG emissions and efforts to reduce them?

Subsequent issues of *BATE* will provide a closer look at each of the ISO GHG standards. ■

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Climate Change Update

Cloud Feedback Appears to Amplify Global Warming

Clouds’ reaction to the greenhouse effect is a key to understanding Earth’s climate change. Will low clouds thicken and spread, shading the planet? Or will they thin and shrink, letting more sunshine through?

An analysis of cloud behavior over past decades suggests that clouds strongly amplify warming. However, most climate models miss that effect. Observations show that low clouds are critical for the climate system’s response, says climate modeler Gerald Meehl of the National Center for Atmospheric Research in Boulder, Colorado

(USA). However, “it’s really a challenge for models” to simulate that response, he adds. If real-world cloud amplification works the way the study indicates, climate change could be even more pronounced than the typical model predicts. The study is available at www.heatisonline.org/contentserver/objecthandlers/index.cfm?id=7424&method=full.

Cloud measurements are far spottier and more recent than temperature measurements. Climate researcher Amy Clement, of the University of Miami in Florida (USA), and colleagues

examined two long-term cloud records over subtropical oceans from Hawaii to Mexico. One is from eyeball estimates of cloud cover made by mariners who passed through the region from 1952 to 2006. The other, from 1984 to 2005, came from calibrated satellite measurements.

The observation sets recorded two major climate shifts in the north Pacific. Starting about 1976, ship-based data showed that cloud cover, especially low-altitude clouds, decreased, while ocean temperatures rose and atmospheric pressure fell. One possible explanation is that a warming ocean transferred heat to the air above, thinning out low-lying clouds to let in more sunlight, which warmed the ocean further. The additional solar heating was large enough to account for much of the ocean warming observed. During a cooling event in the late 1990s, both data sets recorded just the opposite changes — more low-level clouds. The amplifying process ran in reverse.

Clement and her colleagues checked 18 global climate models run under standardized conditions. They tested whether each model properly simulated each element of the positive cloud feedback they had found. Only two models showed low clouds producing a positive feedback as observed.

The HadGEM1 model from the UK Met Office's Hadley Center in Exeter, England simulated clouds especially well. It is among the most sensitive of the 18 models to added greenhouse gases. When carbon dioxide is doubled, it warms the world by 4.4°C. The median of the 18 models is only 3.1°C.

For more, see www.sciencemag.org/cgi/content/full/325/5939/376. ■

Stand on Climate Change Not an I-Tune Favorite

As reported in last month's *BATE*, the US Chamber of Commerce (Chamber) got some unwelcome press coverage when a group calling itself the Yes Men held a mock press conference, passing itself off as the Chamber and announcing its intent to support more stringent legislation toward reducing GHG emissions. The press conference appeared genuine until a bona fide Chamber representative interrupted, calling the incidence a hoax and not representative of the Chamber's position. (For the full story, see <http://abcnews.go.com/video/playerIndex?id=8873503>.)

Unlike the Yes Men parody, Apple Inc.'s decision to quit the Chamber was no hoax. Apple's decision was a direct result of the Chamber's opposition to proposed carbon legislation, making Apple the first consumer brand to leave over the Chamber's greenhouse gas (GHG) policy. The issues prompting Apple to pull out of the Chamber were described in a letter to the Chamber's president, Thomas Donohue, stating, in part, "Apple supports regulating [GHG] emissions, and it is frustrating to find the Chamber at odds with us in this effort."

Apple joined several power companies that pulled out due to the Chamber's stand on climate legislation. Nike vacated its post on the Chamber's board, but will remain a member to advocate for a change in GHG policy within the Chamber.

The catalyst for this mini-stampede seems to have been the actions of the Chamber's vice president for environment, technology and regulatory affairs, William Kovaks. Kovaks called for public hearings to evaluate the evidence that the US Environmental Protection Agency has relied on in proposing to find that certain GHGs threaten public health and welfare. Kovaks said that the hearings would represent the "science of climate change on trial," comparing it to the 1920 Scopes "monkey" trial on evolution.

These comments prompted environmental groups to call on member companies to quit the Chamber in protest. Since then, the Chamber has toned down its stance, and added that it is in favor of "strong federal legislation" that protects climate. Donohue, however, says the Chamber's opposition to the US House of Representatives' climate bill was justified, given that the bill, in the Chamber's view, damages US competitiveness, and also fails to offer sufficient incentives for clean technologies.

For more, see www.businessgreen.com/business-green/news/2250679/apple-latest-quit-chamber. ■

Permafrost Melt Threatens Rapid Climate Change

According to a study released in June 2009, the amount of carbon in frozen soils (16% of global soil area) may be twice as much as previously thought. Large areas of northern Russia, Canada, Alaska, and Nordic lands have deep layers of frozen soil near the surface, called permafrost. It commonly holds 30–70 kilograms of carbon per square meter.

That sums to perhaps 1,300 gigatons (GT) of carbon, or somewhat more than four times all of the carbon ever released by burning fossil fuels.

However, the amount varies by depth. The new study estimates that there are 191 GT in the topmost foot, 305 GT in the next 2.3 feet, and 528 GT in the next 6.6 feet. Counting permafrost soil carbon even deeper, the 1,672 GT of organic carbon in permafrost is one-half the entire global below-ground organic carbon pool.

Global warming has already triggered rapid melting of the permafrost in some areas, releasing greenhouse gases (GHGs) like carbon dioxide (CO₂) and methane. As warming continues, more thawing permafrost will release far more GHGs. They could trigger a tipping point, where huge amounts of these GHGs flood the atmosphere, courtesy of microbial activity, rapidly driving up temperatures.

"Projections show that almost all near-surface permafrost will disappear by the end of this century, exposing large carbon stores to decomposition and release of [GHGs]," said Pep Canadell, executive director of the Global Carbon Project at Australia's Commonwealth Scientific and Industrial Research Organization, and a study co-author. If only 10% of the permafrost melted, another 80 parts per million of CO₂ equivalent would enter the air, for an extra 0.7°C of global warming, almost double warming to date.

For more information, see Tarnocai, C., et al., "Soil Organic Carbon Pools in the Northern Circumpolar Permafrost Region," *Global Biogeochemical Cycles*, Vol. 23, 27 June 2009. ■