# A Snapshot of Private Sector and Non-Government Organizations' Science and Technology Communications Tactics and Related Best Practices

A Report Commissioned by The Science and Technology Communications Sub-Committee of the Council of Science and Technology Advisors (CSTA)

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# PART I. INTRODUCTION: A FRAMEWORK FOR S & T COMMUNICATIONS.

## I.A. Introduction and Objectives.

Communicating on science and technology (S & T) topics is a fact of daily life. Newspapers and nightly news broadcasts carry items that trumpet the latest scientific advances. Government ministries issue technological advisories (e.g., food warnings), provide its position on a global scientific issue (e.g., climate change), comment on scientific reports, or respond to queries from citizens on the latest information on some product or procedure.

The stakeholder communities on these same S & T issues are similarly engaged in communication activities directed at various audiences. **This background paper will focus specifically on how the private sector and non-government organizations conduct their S & T communication activities and the best practices that can be identified from these sectors**[1].

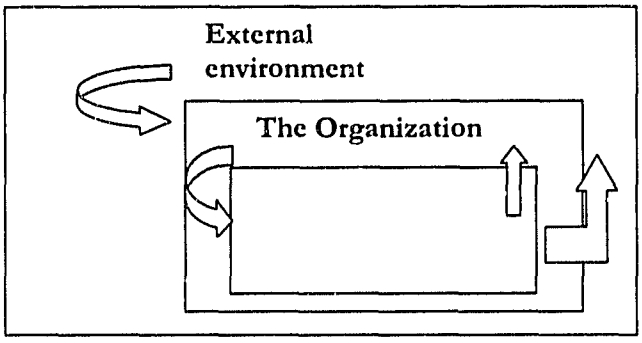
The paper is organized around three questions: (1) What constitute features of effective communication strategies, in general, and what features about science and technology subjects, in particular, affect these strategies? (2) What practices can be identified in the private and NGO sectors? And, (3) What lessons can be drawn from these experiences?

## I.B. Strategic communications planning principles: A general framework.

We offer here a set of general principles that characterize effective strategic communications planning. These principles derive from a broader framework, which is critical in understanding the place of communication strategies and practices within that wider context. One such principle is to understand the external environment within which the organization operates. This environment provides the contingencies that influence what

an organization does, which set constraints, or which provide opportunities. Another principle involves the organizational setting, which is critical to the successful operation of a communications strategy. Likewise, the elements within an organization – its culture, values, priorities, the resources it provides (or withholds), and its relationships with its stakeholders —affect the organization's communications efforts.

**Figure 1. Strategic Communications Planning in Context**




An effective strategic communications plan typically takes the following questions into consideration:

1. What is the organization's mission and what is its vision for the intermediate and long-term future?
2. What is the current situation or environment within which the organization operates?
3. What publics or stakeholders are the most important to the organization?
4. What does the organization know about its publics?
5. What does the organization want to achieve with its various publics?
6. What does the organization do to listen to or learn from its various publics?
7. What messages best facilitate achievement of the organization's various objectives?
8. What means can be utilized to promote these messages?
9. What action steps are required with what resources?

10. How does the organization know it is achieving its communication objectives?

These questions emphasize particular features of strategic communications planning: its foresight dimension; its match between its objectives, publics, channels, resources, and outcomes; its pursuit of dialogue with its various publics; and its accountability (see, for example, Chess and Hance, 1993).

We also emphasize the point that, for communication strategies to be effective over time, **they need to be embedded in a dynamic process of organizational learning in the form of a learning loop, an iterative means of on-going organizational change.**

## Part I.C. Dimensions of S&T Communications.

What is it about S & T subjects that might make them different or unique? There are three features that we believe are noteworthy:

The first is that S & T topics frequently *involve esoteric or technical knowledge* that often extend beyond what the layperson knows from ordinary schooling, day-to-day experience, or informally acquired knowledge. Technical subjects need to be presented and discussed in ways that are accessible to most laypersons. The need for further explanation is related to the "unnatural" nature of science. Scientific explanations about the world are sometimes contrary to common sense or counter-intuitive, and the process of doing science often involves consciously checking for "the pitfalls of 'natural' thinking" (Wolpert, xii).

Second, communication about S & T frequently involves *communicating about risk.* There is a very large literature on risk assessment, risk perceptions, and risk communications that points to the need for dealing with risk as a special consideration. For example, the risk communication literature proceeds from the premise that risk assessments by technical experts often deviate from the way publics perceive risks. An understanding of how the public perceives risks is critical to effective risk communication practices (see, for example, National Research Council, 1989).

The third feature about S & T topics is the presence of ***scientific uncertainty.*** Here we distinguish between *uncertainty in the scientific knowledge base,* on one hand, and policy disagreement on the appropriate approach to a scientific policy question, on the other. It is

the former that we refer to here. This uncertainty is a common element in many of today's S & T controversies. The dangers of underplaying or exaggerating these uncertainties – or not recognizing that they even exist – can result in problems for communicators.

Minimizing uncertainties can lull the public into a false sense of security. It could also mean that caveats expressed by experts could be ignored. Exaggeration of uncertainties, on the other hand, can delay potential beneficiaries from receiving positive outcomes. It may also obscure the scientific basis on which a decision has been taken (e.g., whether to issue a health advisory, whether to regulate, etc.). The current debates on "science-based risk assessment" versus use of the precautionary principle are illustrative of the use of scientific uncertainty to promote (or limit or prohibit) certain technologies. In general, careful delineation of existing scientific uncertainty provides audiences with some sense of the degree of scientific consensus, and gives them an opportunity to differentiate between minor and major uncertainties.

The world in which S & T currently operate is also very different from the earlier contexts. While S & T were celebrated during the industrial revolutions and during the periods of the world wars, this celebratory and non-critical stance has been replaced with a mixture of awe, anxiety, and some distrust as publics have experienced some of the disasters associated with technology's consequences, some of which were unintended. These include the potential for nuclear war and nuclear disasters, toxic wastes, environmental degradation, and other unforeseen consequences.

At the same time, the ways in which science is being done today have also changed. The large pots of public funds available to scientists have diminished over the years, to be replaced by other sources of funds including the private sector. Such partnerships have been encouraged at the federal level for the granting councils but have also applied to federal government science. While there are many advantages to these collaborations, these arrangements can also raise questions about the interests that are behind, and the credibility of, these studies. This is not to say that these questions cannot or should not be addressed -- being transparent about funding sources or sponsors is one important approach, for instance. This is simply our way of saying that the doing of science is different today from a decade ago or longer.

Publics have also changed. No longer do publics accord blind trust to many institutions or groups, nor is trust demonstrated in a vacuum. The assumption that mere provision of more 'scientific information' will lead to unquestioning acceptance of the position promoted has been shown to be flawed; rather, reception of scientific and technical information is done in the context of perceptions of the institutions or the technical experts themselves. As Wynne astutely observed:

> Work in the areas of public responses to science and technology and public risk perceptions assert that the basic framework of public responses rests upon the experience and perception of the relevant institutions or social actors, not upon the understanding of technical information, framed in ways that implicitly take trust for granted. (Wynne, 1995). Wynne, B. (1995). The public understanding of science. In S. Jasanoff,G. Markle, J. Peterson, T. Pinch (eds., Handbook of science and technology studies. Thousand Oaks, Ca.: Sage.

Finally, we can talk about the changing context of science in terms of changing conceptions of expertise. Again, while there had long been a tacit acceptance of expertise as resident only among scientists and technical experts, skepticism has grown among publics, fuelled by the experience of seeing expert forecasts sometimes being shown to be just plain wrong. In addition, there is growing recognition that expertise may also reside in other communities (the farmer who knows about planting and weather conditions, the indigenous community familiar with the medicinal properties in tropical plants in its environment, the patients whose experiences with a disease provide its 'lived familiarity'). The need to redefine "expertise" was explicitly recognized by European policymakers in their White Paper on European governance. This policy paper maintains that the sources and functioning of expertise could be found in different sites and in diverse ways beyond scientific knowledge. The paper further argues that such a broader definition of expertise, when supported by conditions of transparency, accountability, independence, and plurality could become a stronger basis for democratic governance. (Commission of the European Communities, 2000. White Paper on European Governance: enhancing democracy in the European Union. SEC 2000:1547/7, Final Report. October.)

The changing contexts for science and technology have made some argue that science today is involved in a political battle for its future (Leadbetter, 2000), making it imperative for "science ...to engage with how it is governed and for whom it is accountable

in a way it has never done before." (Leadbetter, 2000, p. 189). This mix of changing contexts and practices suggest that communicating about S & T will also have to take account of these factors.

**Contextualizing federal S & T.**

We end this section by describing the context in which science and technology occur in the federal government. This is important because the process of communicating on S & T may differ depending on their different contexts. This context may be described more adequately by posing the question 'what kind of science is being done or used for what kind of purpose? In this respect, we can point to three different contexts. The first is one where basic and applied science is actually carried out by government laboratories and government scientists. For example, Agriculture Canada or Natural Resources has scientists in agricultural centers or laboratories conducting research on plant or fish species that are particularly relevant to the Canadian economy (the highly successful canola is a good example of a product from federal agricultural science). In this respect, this kind of science is no different from that conducted by scientists in other types of institutions such as universities or the private sector.

The second type of science is what we will call science in the service of the regulatory function. Here, scientists within the bureaucracy may be called upon to make produc safety assessments, provide input into regulatory approvals or rejections, or assess scientific data provided by licensees or applicants.

The third type of science is that provided by external expert advisory bodies. These may be groups of scientists from other institutions invited by the federal government to provide specific advice on a given issue.

In the case of the first category, scientists who operate much like scientists from other types of institutions will need to submit their findings for peer review, disseminate their results, and network and collaborate with others working on the same topics. The increasing call to scientists to disseminate their findings beyond the narrow confines of their discipline, to engage with broader publics, and yes, even to promote their work will be equally applicable to federal government lab scientists.

Science in the context of regulation has other dimensions that affect its communication. In this respect and, where applicable, the governing principle has been to use science as a primary foundation for making risk and safety assessments. Having said this, we also recognize that many policy decisions that involve science are also political decisions, decisions which involve the consideration of social and ethical values. The recent controversy over stem cells is a good illustration of the difficulties of making decisions solely on the basis of science. A country like Singapore might opt for allowing the cloning of human embryos for certain research projects, making this country have one of the world's most liberal guidelines for this type of research (CNN.com/world, 18 July, 2002). Canada, on the other hand, may opt to ban cloning of human embryos. The science may remain the same for both governments but consideration of other factors might necessitate a different policy direction. In this context, it is extremely difficult to separate science from the consideration of other social values.

In the case of external advisory bodies, the science that is produced or assessed will likely be emphasized in its communications, including such attributes as its membership, its independence, the broadness of its expert base, and the evidence used as the basis for its recommendations.

It is useful to keep these features and contexts in mind when thinking about communicating about S & T as we attempt to bring forward a picture of best practices as well as problematic practices in this arena.

# PART II. S & T COMMUNICATION STRATEGIES IN THE PRIVATE SECTOR.

Our overall methodology for this section on private sector practices is two-pronged: first, we identified industries that typically deal with S & T topics (i.e., the oil and gas industry, the pharmaceutical industry, and the chemical industry). Second, we identified in-depth case-studies that demonstrate best practices on a given issue or illustrate problem practices. Specifically, we included (1) a case study of Shell as a "best practice" company on the issue of sustainable development; (2) a case study of the pharmaceutical industry's communication practices on drug safety; (3) a case study of the chemical industry's Responsible Care (™) program; and (4) an example of poor communication practices on the issue of silicone breast implants. For the various cases, we employed a mix of the following approaches: (a) a literature search; (b) an Internet scan; (c) document analysis; and (d) key informant interviews. For both industry and NGO's, we also conducted interviews with key science journalists to obtain an independent assessment of media interactions with sources in both these sectors.

## Part II.A. The Case of Shell (Shell International and Shell Canada).

Shell is a major multinational energy company that has emerged as a leader in sustainable development initiatives as well as in communicating about them. Shell has launched an assortment of communication strategies, targeting different audiences, and employing different media effectively. The amount of information on its sustainable development initiative is unprecedented, especially when compared to those of its peers such as BP (British Petroleum) or ExxonMobil.

### II. A. 1. Impetus for Shell's Communication Activities.

Shell International has not always been a leader in communications. While the company has received recognition for communication activities (for example, it received the World Aware Award for Effective Communication in 1994 for a documentary film), it has also faced some serious communication challenges, illustrated by the following two very

controversial incidents: the Brent Spar Offshore Platform case and the Nigerian executions of Ogoni environmental activists.

In April of 1995, after Shell presented environmental impact studies, the British government granted Shell permission to dump an obsolete oil storage platform - Brent Spar - in a deepwater trench in the North Sea. Greenpeace UK reacted quickly by launching an occupation of the platform and publicized this issue so successfully, that Shell had to find an alternative method for the dismantling of the platform. From a communications viewpoint, Shell suffered a major blow to its reputation as well as to its public relation capabilities – despite the fact that the scientific basis for Greenpeace's position on environmental damage from this form of disposal turned out to be flawed. On the heels of this event came the much publicized hanging of Ken Saro Wiwa and eight other political activists by the Nigerian government for speaking out about the environmental damage to the Niger Delta caused by Shell Oil. Shell received world-wide condemnation for turning a blind eye to these atrocities.

Shell hired consultants in risk management, public relations, environmental issues to assist in conducting a major company review of these incidents and its associated communication strategies. This resulted in a thorough overhaul of Shell's approach to a variety of issues. As Shell's Managing Director Jeroen van der Veer, (Veer, 1999) put it:

> *Initially, Brent Spar for example, was a classic example of what I term the old-fashioned DAD approach to decision-making - Decide, Announce, Defend. Genuine dialogue however, requires companies to adopt the DDD approach - Dialogue, Decide, Deliver. DDD is an attempt to come to terms with the realities of a new "show me" world. The days when people trusted business and government to take decisions on their behalf are over. Today, it's no longer enough for companies to simply say "trust me." Companies are in the spotlight as never before. The show me world has already had profound implications for the way in which Shell and other companies conduct business.*

This kind of strategic thinking from the top levels of the company has translated into a meaningful communication strategy that spans this company's vast operation. Since those two incidents, Shell has developed a communication strategy that uses the Internet as a focal point for all its communication activities. "There was a new factor in the game, which had been completely missed out: the role of the Internet" said Simon May, Internet Manager at

Shell, in a presentation at a PR conference in Brussels. (May, S. 1998). "Shell was not going to make that mistake again."

### II.A.2. Elements of Shell's Communications Strategy.

In this report, we focused on the company's communications efforts around Sustainable Development but it is important to recognize that this is one among many initiatives that are part of Shells' larger communications strategy. The Sustainable Development initiatives have support from the very top. Phill Watts, Chariman of Shell International, has said: "The Shell Companies have commissioned world-wide opinion research. Every study poll tells us that people see the environment as the most critical issue facing the industry. It would be folly to ignore such concerns" (Henderson, H. 2000).

We have examined these communication activities and described them in the context of what we consider to be the communication principles that make up this integrated set of Best Practices. The first principle, which we have already alluded to is **the necessity of support from the top**. Without this, it is easier for a communication strategy to be derailed by conflicting messages or getting shut down.

The second principle is **the focus on a few selected key messages**. This set of messages is strengthened by their repetition across media channels. These key messages include the following:

- Sustainable development integrates economic, environmental and social objectives

- Sustainable development involves diversified energy sources

*"Through sustainable development we integrate the economic, environmental and societal aspects of our business to achieve sustained financial success, safeguard our environment and develop our reputation as partner and provider of first choice for all of our stakeholders. Sustainable development is not just about the environment and social concerns; it's very much about economic performance too. For these reasons it makes good business sense"(Sustainable Development, Issues, Shell.com).*

**Making science and technology accessible to the public** is another feature that specifically relates to this set of best practices. These illustrations below show how technological ideas such as the extraction of geothermal energy and renewable energy resources are communicated so that they are comprehensible and relevant to audiences.

They also demonstrate the sustainable development principle of integrating economic development with environmental considerations. Finally, the realistic recognition of the economic risk involved ("Costs are currently high") is included in the message.

**Figure 2: Extracting energy from hot rocks**

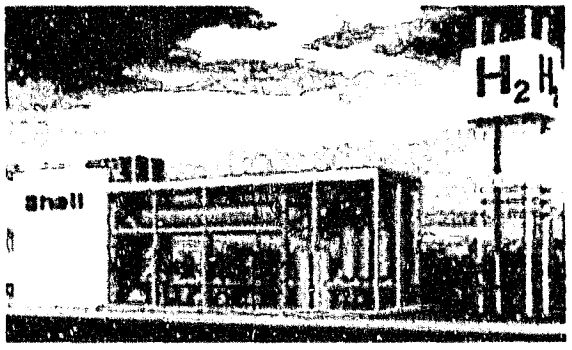
Generating electricity from heat deep beneath the earth's surface – geothermal energy – has the potential to become more widespread with Shell's hot fractured rock technology pilot project in El Salvador. Tapping conventional geothermal energy involves drilling deep into the rock and extracting naturally occurring steam (above), but it is rare to find rock formations where this is present. The new technology unlocks a virtually unlimited resource by drilling into hard rocks and then pumping water in under pressure. This expands natural cracks and the hot rock acts as a boiler. The steam from this pilot will then be extracted and used to generate between two to five megawatts of power for supply to the El Salvador electricity grid, enough to power 9,000 homes. This technology builds upon experience in the USA, Japan and Europe and offers large potential for the future. Costs are currently high, but Shell believes that with time, these can be brought down to levels competitive with conventional energy sources.

Another example is an explanation of hydrogen as a fuel source, in this instance in a description of Iceland's attempt to replace its reliance on traditional fossil fuels with hydrogen

**Figure 3: Fuel Cell Technology**

Fuel cells turn hydrogen into electricity. As their only emission is water, they are being considered as potential for clean replacements for the internal combustion engine. Fuel cell technology, although well established for specialist uses such as space travel, is only now being applied to vehicles.

There is a need for hydrogen production and distribution systems to support them. The consortium, which includes the automotive group DaimlerChrysler and Norsk Hydro, will work with the Icelandic authorities to test the technologies and distribution systems. The hydrogen will be made by electrolysing water using electricity generated from renewable energy. Three hydrogen buses will be introduced in 2003 and tested in the capital, Reykjavik. Re-fuelling will be at a Shell station, using a hydrogen fuel plant supplied by Norsk Hydro. If the trial is successful, other buses will be converted and eventually all Iceland's transport systems, including its large fishing fleet, could use hydrogen. The programme is funded by consortium partners, the Icelandic government and the European Union.



The third principle is Shell's **effective use of diverse media.** Shell uses the print medium in a variety of ways to communicate about its sustainable development initiatives. The print format includes reports, brochures, progress updates and annual reports that are distributed to the shareholders and available from the company. In addition, Shell uses extracts of these reports and reprints them in national newspapers and magazines. Many of these advertisements in print or broadcast media reemphasize key messages. This very basic use of communication strategy, i.e. "reinforcing what is said in one medium by showing it in another," reflects a well thought out, efficient, and effective message dissemination plan.

We also focused on the company's **effective use of the Internet.** For this report, we analysed two main sites: ***shell.com*** and ***shell.ca***. In 2000, there were about 520 million Internet users' worldwide (Zenith Media, 2000) and Shell's activities on the net are far reaching. This was not always so. According to Simon May (May, S. 1998), Shells' Internet Manager in 1998, Shell had not paid much attention to the Internet in the early nineties and this caught them off guard. Environmental and human right groups grasped the power of the Internet early on and used this tool to mobilize public support (often against corporations' inadequate performance on environmental issues). Shell was caught unprepared on a number of occasions. Under May's guidance and with support from the Royal Dutch Shell Group, the first website was launched in 1996.

The main web site and its sub-sites are well structured, dynamic, easily navigable, but also contain enormous amounts of information. As with most corporate websites, it contains menus, search facilities, site maps and hyperlinks. But what is notable about Shell's website is its use of more sophisticated web applications, such as video and audio clips, feedback forms and, perhaps most important, a discussion forum called "Tell Shell" (described below).

Sustainable development is a primary issue of interest to Shell, judging from the amount of materials both on its site and those it produces for distribution. The sustainable development issue is located directly under the *About Shell* section in the "Issues" subsection of Shell's main webpage. It starts of with seven principles that guide Shell in the realm of sustainable development. It then outlines Shell's efforts in this area with links to the UN site and other international sites, which give it credibility. There are also links to its recent annual reports that have focused heavily on the sustainable development issue. This contrasts with the much more limited efforts of other energy companies in this area.

Another element in this Best Practice set is **its foresight dimension; that is, the company engages in continuous environmental monitoring as a proactive rather than a reactive strategy.** For example, by listening to the Internet community, Shell can effectively gauge public opinion about the company. To that end Shell employs specialized, external consultants as well as the services of E:Watch and Infonic, firms that scout the Internet daily, and build an inventory of what is being said about Shell and in what context (May, 1998). Using this kind of business intelligence, Shell is better prepared to deal with issues that are brewing.

**An emphasis on dialogue** is another element in Shell's communication approach. The principl of openness and dialogue are evident on the issue of sustainable development. One way that Shell listens is by a unique feature on its website called *Tell Shell.* This is a series of uncensored forums soliciting comments on any aspects of Shell's policies, practices and principles. "Engaging our stakeholders is at the heart of our commitment to listening and responding" (Shell.com, 2002). A recent examination of the archived forum on "Sustainable Development" showed sixty-two messages. Shell sometimes responded to the messages with "The relevant person has contacted you via your e-mail address." In other instances, it referred the writer to the part of its website which deals with this issue. Its sites typically invite feedback:

> WE WELCOME YOUR INPUT. CONTACT US ON THE INTERNET AT WWW.SHELL.CA OR WRITE TO US AT: *ACTION TODAY WITH TOMORROW IN MIND*, SHELL CANADA LIMITED, 400 4TH AVE, S.W., P.O. BOX 100, STN. M, CALGARY, ALTA. T2P 2H5

Shell also encourages dialogue by allowing people to e-mail their questions to the company and assures them of a timely response. According to May, Shell receives over 1,100 e-mail messages a month and each of these is answered personally and within forty-eight hours –no "form-letter" replies are permitted (May S., 1998).

Using these different listening strategies-i.e., m oring the Internet, the *Tell Shell* feature, e-mail, etc.—enables Shell to amass important information on issues of concern to its publics. It then analyzes the information and provides company views, information on its initiatives, or other responses to questions that appear most pressing to the public.

Other illustrations to demonstrate the International Group and Shell Canada's interest in dialogue is reflected in these examples cited on Shell Canada's website (Shell.ca)

**Stakeholder Roundtable**: A meeting of politicians, environmentalists, academics and business leaders and Shell Canada decision-makers to discuss national, industry and company issues including Shell's commitment to sustainable development and the process and timing of becoming a renewable energy company.

**Community Dialogue Program**: A formal framework to enhance the dialogue between the Shell refineries and product facilities and their communities and to facilitate one another's views and issues and more effectively communicate emergency response planning.

**Communicating with East Coast Fishing Communities**: A program to improve communication between the fishing and petroleum industries. Information shared at meetings with fishermen allows each industry to have as little impact on the other as possible, especially related to seismic surveying.

**Talking with Young Canadians**: Following an international sustainable development conference, a group of Canadian youth was invited to meet with Shell's president and senior management. The young people described their concept of the role of the Shell service station of the future. This dialogue continues and now includes young Shell Canada employees.

**Shell Canada Climate Change Advisory Panel**: This Panel includes local, national and international environmental and community leaders to review greenhouse gas management plans, tests options for the reduction of emissions The Panel regularly examines Shell's commitments on climate change and assess progress against those commitments.

## YOU TOLD SHELL

"I would be much less skeptical of Shell's stunning public image creation if there were a greater demonstrated commitment to non-fossil fuel renewables. I would suggest that the level of funding of research and development for renewables be an incremental percentage of your primary exploration budget."

**Author Unknown, http://www.shell.com**

**Communication Strategies Have to Reflect Company Performance.** This additional principle is a foundational one for communications. Simply put, this is called walking the talk.. Shell shares and emphasizes internally the same messages it promotes to external audiences. The company has a wide Intranet used extensively to communicate and interact with employees, to involve them in the future of the business, and to help them develop their own careers. The Shell *Business Television Program* initiative was also launched to be able to deliver messages to all Shell employees worldwide at the same time. Just as the use of Shell's Intranet promotes communication within this vast organization, business television programs are used to provide a sense of interaction with Shell and its employees and enhance internal communication.

Shell's communication activities reflect a well thought out strategy that is aligned with its business practices. As the President of the Royal Dutch Petroleum Company and a Group Managing Director observed at the end of his address in 1999, "Ultimately, we will be judged by what we do rather than by what we say." In addition to employees internalizing key messages, actually behaving as a company that believes in sustainable development is the foundational practice. As part of its business strategy, Shell has turned its attention to sustainable development of energy. "The fact is that today, sustainable development has become part of the business mainstream in a way unthinkable only ten years ago" (Van der Veer, 2002). Shell operates on a "twin track" development strategy by investing in the development of commercially viable renewables while at the same time, doing more to produce hydrocarbons in a sustainable way. At the same time, the company's corporate communications programme is closely linked to its efforts to incorporate sustainable development across all of its activities (DeGaufee, 2002).

> Mark Moody-Stuart, Shell's top executive, maintains that communications on sustainable development are not simply about PR and reputation, but about the fundamental nature of business and ensuring Shell's long-term success. *"The 'ethical challenge to global businesses is not simply a question of reputation and responding to the legitimate concerns of NGOs and local communities. For Shell, this process is about far more than 'stakeholder dialogue' or producing regular reports. It's actually about the type of business the Royal Dutch/Shell Group must become in our new century."*
> (19/07/2000 Putting Principles Into Practice: The Ethical Challenge to Global Business)

**Effective use of partnerships and sponsorships** is another feature of the company's communication strategy. On Sustainable Development issues, Shell International has developed partnerships with organizations such as the Pew Center on Global Climate Change, Business Environmental Leadership Council (http://www.pewclimate.org/belc/index.cfm) and the World Business Council on Sustainable Development (http://www.wbcsd.ch/) on climate change and environmental protection. Examples of the company's sponsorships include:

- Sponsorship of the International Institute for Sustainable Development in Winnipeg. This organization advances policy recommendations on international trade and investment, economic policy, climate change, measurement and indicators, and natural resource management to make development sustainable. They report on international negotiations and broker knowledge gained through collaborative projects with global partners, resulting in more rigorous research, capacity building in developing countries and a better dialogue between North and South (http://www.iisd.org/default.asp).

- Partnerships which focus on developing local capacity. For example, by working closely with Fort McKay to develop the scope and capacity of existing businesses Shell Canada was able to award over $25 million in contracts to nine aboriginal businesses.

- The Shell Sustainable Energy Foundation established to support efforts to achieve a balance between economic growth, care for the environment, and equitable social development. A project supported by this foundation is the Biodiversity Assessment Programme of the Smithsonian Institution in the U.S.. It will receive $2.8m of funding for a five-year project to develop techniques for mapping and monitoring biodiversity, particularly in ecosystems that could be affected by exploration and development (http://www.shellfoundation.org/).

- Shell International and the *Economist* magazine co-sponsor a writing award. This annual event encourages thinking about the future. The 2001 contest was 'Going Faster- but where?' and was dedicated to the theme of mobility and the sustainability of 21st Century travel. Entrants were asked to discuss how mass mobility will affect society, politics, commerce, technology, culture and the world's environment (http://www.shelleconomistprize.com).

A good strategic communications approach is not complete without any indication of whether its objectives have been met. **Evaluating programs** for this purpose is another component of an intelligent approach. Shell has pursued a communications strategy that began with a clear idea of what it wanted to achieve and to that end, mechanisms to evaluate

the effectiveness of this strategy were implemented. For example, opinion tracking has demonstrated that since Shell International launched its communications campaign in 1998-99, starting with the Shell Report and other media campaigns, public perception of the company has become more positive (http://www2.shell.com/home/Framework?siteId=listeningresponding-en&FC1=&FC2=%2FLeftHandNav%3FLeftNavState%3D2%2C1&FC3=%2Flisteningresponding%2Fhtml%2Fiwgen%2Flistening%2Fhowdidwemeasure_10200720.htmi&FC4=&FC5=) .

Mallenbaker (2002), in his review of the "People, Planet and Profits" report, noted that:

> *There is no doubt that Shell has done more than just about any company to produce reports which are easy to understand, full of measurable and verifiable indicators of serious social and environmental performance, and which has gone furthest of any company in giving a platform to anyone and everyone who has an opinion, however damning or dismissive.*

An international consultancy dedicated to promoting the business case for sustainable development, SustainAbility (http://www.sustainability.com) was invited to help guide Shell towards a more sustainable and accountable approach to business. As they worked with Shell, they released interim reports and highlighted their recommendation that Shell engage in stakeholder dialogue. Shell has complied with these "extensive stakeholder engagement programs." In these external assessment, Shell scored 9 out of a possible 10 on the criterion of **[helping to] create greater stakeholder involvement, participation and understanding**.

Shell has also received awards that indicate some recognition of its communication efforts and achievements[2]. Despite these accolades, some critics still remain suspicious. Some have called Shell's massive communication efforts "Greenwash," which is defined by the corporate watchdog group CorpWatch (http://www.corpwatch.org) "as environmental image advertising. Pristine natural scenery and pious declarations of respect for the earth are the greenwash clichés used repeatedly by mining, nuclear and chemical giants, among others." CorpWatch awarded Shell the Greenwash award in 2000, putting Shell in the

company of BP and Chevron as the oil companies with the prettiest and most misleading environmental advertising in the world.

Friends of the Earth, in response to the People, Profits and Principles report, declared "The people at Shell have changed a lot in the way they communicate. They are much more careful now" (Bloemink, 1998). However, other environmental organizations such as the David Suzuki Foundation have recognized Shell's improved performance on sustainable development (Suzuki, 2001).

### II.A.3. Summary: Shell as a best-practice company on sustainable development.

The elements we have identified from an examination of Shell International and Shell Canada's communication strategies on the issue of sustainable development operate on two levels: the first reflect generic communication strategies within the communication cycle including use of foresight mechanisms, solid understanding of audiences and stakeholders, attention to message design, appropriate use of communication channels including new information technologies, an emphasis on two-way communications with stakeholders, and communication program evaluation. These generic elements are buttressed by supportive organizational conditions such as an appropriate resource base and support from the highest levels of the organization.

In the context of communication of S and T, Shell has also demonstrated some strengths. It has communicated its various approaches to sustainable development by clearly describing the alternative energy technologies to its publics, incorporating the science, economic and environmental dimensions and discussing both risks and benefits. In addition, it has conducted these practices in the context of partnerships with stakeholders, partnerships that have recognized the value of broader perspectives and expertise.

## II.B. The Pharmaceutical Industry: Drug Information and Safety Communications Practices.

In this section, the communications practices of the pharmaceutical industry will be examined by focusing on drug information and promotion and drug safety. The pharmaceutical industry is a useful sector to examine because it is a strictly regulated sector, with regulations extending to the industry's communication practices. Providing another angle on science communication, this case provides lessons from the perspective of communicating on risk, and communicating with and learning from stakeholders.

### II.B.1. Industry Context.

The pharmaceutical industry is often involved with drugs that are scientifically complex and have a degree of uncertainty associated with them. Approval and release of these drugs is regulated by governmental agencies. In contrast to other industries, communication about these drugs is also regulated by governmental agencies. For example, Pfizer's website homepage (http://www.pfizer.ca/health/) has a prominent notice (Figure 4):

Another communication restriction mandated by federal regulators was direct-to-consumer advertising. This was lifted in 1997 by the FDA and this type of advertising proliferated in the U.S., a situation which is now about to be replicated in Canada with the relaxation of this restriction.

**Figure 4: Regulation of Pharmaceutical Communications**

> NOTICE: Federal regulations limit the scope of information that pharmaceutical companies are authorized to give on prescription drugs via the internet or other means. To obtain more detailed information on the properties or appropriate use of any prescription drug, please consult a qualified health care professional.

(See, http://www.pfizer.ca/health)

Creation of a drug is a long, complicated, and costly process, typically involving four stages: a pre-clinical stage usually involving testing on animals; a clinical stage involving controlled human trials (which could initially involve testing on healthy individuals, followed by testing on patients), agency review and approval, and marketing (again involving pre- and post-market surveillance). The market surveillance stage is commonly known as *pharmacovigilance,* or the long term monitoring of medicines to identify previously unrecognized safety hazards communication of such information to health care professionals and patients (http://www.parliament.the-stationery-office.co.uk/pa/cm199899/cmselect/cmhealth/549/549ap36.htm).

The production of a drug involves a lengthy and expensive process, estimated on average to be 10-15 years and costing anywhere from $10M to $20M (Leonard, 2001). These front-end investment costs make it imperative for a pharmaceutical company to ensure recovery of these costs in the market. On the whole, they have been successful, with pharmaceuticals among the most profitable industry sector, according to Fortune magazine's annual analysis of America's largest companies: these companies had the greatest return on revenues, with a profit of 18.5 cents for every $1 of sales, which is eight times higher than the median for all Fortune 500 industries and significantly more than the next most profitable sector, commercial banking (http://www.citizen.org).

Drug safety has a checkered history. Among the more notorious cases was the Thalidomide case which involved a drug prescribed to pregnant women as medication for morning sickness. The drug resulted in an estimated 10,000 babies born with various deformities (Mann, 1984). The underlying tragedy was that although the drug was recalled in Europe, as soon as problems arising from the drug became evident, it took many months before the drug was recalled in other parts of the world, including Canada. While an old story, the problems of de-emphasizing or denying risks and delaying communications are ones that keep re-surfacing. In Canada, our recent experiences with tainted water in Walkerton and our blood supply are illustrations.

There are also examples of excellent handling of a risk situation with appropriate risk communications. The Johnson and Johnson Tylenol case in 1982 set the bar for good corporate responsibility. In Chicago there were reports of cyanide laced Tylenol causing deaths. The company reaction to this crisis was swift. J&J made two tough decisions: to

recall 31 million bottles with a retail value over $100 million and to announce a reward of $100,000 for information leading to the arrest and conviction of the responsible party. The success of the recall was due to a collaborative effort with the media, the Chicago Police Department, the Federal Bureau of Investigation (FBI), and the Food and Drug Administration (FDA). Moreover, the decision to recall the product on the premise of "putting customer safety first" versus other motives such as minimizing losses and maximizing profits from the sale of the drug created little to no controversy or debate. The company also stopped making Tylenol for two months until tamper-proof packaging was available. As a result of these good communication measures J&J was able to avert a larger tragedy and in doing so also saved its reputation (http://codesign.scu.edu/505/set01/002/moraltylenolrecall.html ).

We analyzed four major pharmaceutical multinational companies with significant Canadian operations (Pfizer, Bayer, GlaxxoSmithKline, and Novartis). Table 1 provides a summary profiling these companies and the various communication and promotional strategies they employ. A literature review on pharmaceuticals' communications practices was also utilized. In addition, we also examined the websites of major pharmaceutical companies in the U.S. including Pfizer, Merck and GlaxxoSmithKline. We will review the general challenges pharmaceutical companies face, then discuss the strategies they use.

### II.B.2. Major Industry Challenges.

At the heart of the pharmaceutical industry's operations are the research, development, and marketing of drugs and related healthcare products. Four challenges mark these operations which impact on communications.

First, these products involve risks and benefits for users and, even at the market stage, can involve uncertainty in terms of the product's immediate and longer-term impacts. Communications to relevant groups and institutions around these issues are thus imperative and, for prescription drugs, are mandatory for the company. The potential for serious and unexpected adverse reactions, such as deaths, hospitalizations and disability for persons taking the medications leads to a heightened awareness by the pharmaceutical companies about product safety, lawsuits, public relations problems and costly recalls or withdrawals of drugs from the market.

Second, the fact that research and development efforts are costly and have long timeframes also impose an added pressure to recover investment costs on the few products that actually make it to market.

Third, as with other industries, the public perception of profit as the driving force for industry activities makes this sector's communication efforts suspect. This challenge is even more burdensome with the industry's products sometimes associated with life-and-death situations. The need for an aura of credibility is thus even more demanding for pharmaceutical companies.

Fourth, patients and consumers in general are increasingly motivated to be informed consumers and are proactive about searching for appropriate and credible information. An increasing interest in balancing the power differential between those who produce drugs and those who use them is demonstrated by initiatives that promote the patient's perspective. For example, a new Internet database called Dipex (Database of Individual Patient Experience) provides an opportunity for people from around the world with a disease to share and compare experiences (Vogt, 2002). The burgeoning number of web-based clearinghouses helping patients find more information and self-help groups are additional indicators of a greater interest in patient participation, trends which cannot be ignored when considering such health issues as drug safety[3].

Having said this, there exists at the same time another challenge, which is ensuring safe use of drugs and other medications. The problems with drug safety and communications around this issue are not limited to what the companies are doing or not doing. About half of patients fail to take their medicines properly (George and Rabin, 1993) and this has been traced primarily to a lack of awareness and understanding of the risks of drugs (Vogt, 2002). A meeting on drug safety communications framed the problem of improper use and understanding of medication as a public health issue requiring greater commitment and resources. In response to this problem, the U.S. National Patient Safety Foundation conducted a deliberative forum on the issue of safe use of medications which involved a diverse group of stakeholders. Participants concluded that consideration of this issue as a public health issue required a partnership among all stakeholders (Vogt, 2002) in the context of a systemic change. Observations of the limitations of the expert-based model on this issue were among the problems raised which could be addressed by viewing the patient-consumer as a partner in the risk-benefit analysis.

These elements provide a mix of factors, which can influence the nature of the communication strategies used in this sector.

Now to turn to these companies' publics and stakeholders and their communication approaches.

### II.B.3. Publics and Stakeholders.

Figure 5 provides a picture of the complex interrelationships between a pharmaceutical company and its various publics and stakeholders. As the diagram suggests, a two-way relationship is not simply between a company and a particular stakeholder group, for example between a company and healthcare professionals. The latter also communicate with other stakeholder groups including patients, consumers, the media, and regulatory agencies.

**Figure 5: Pharmaceutical Companies and their Publics/Stakeholders**

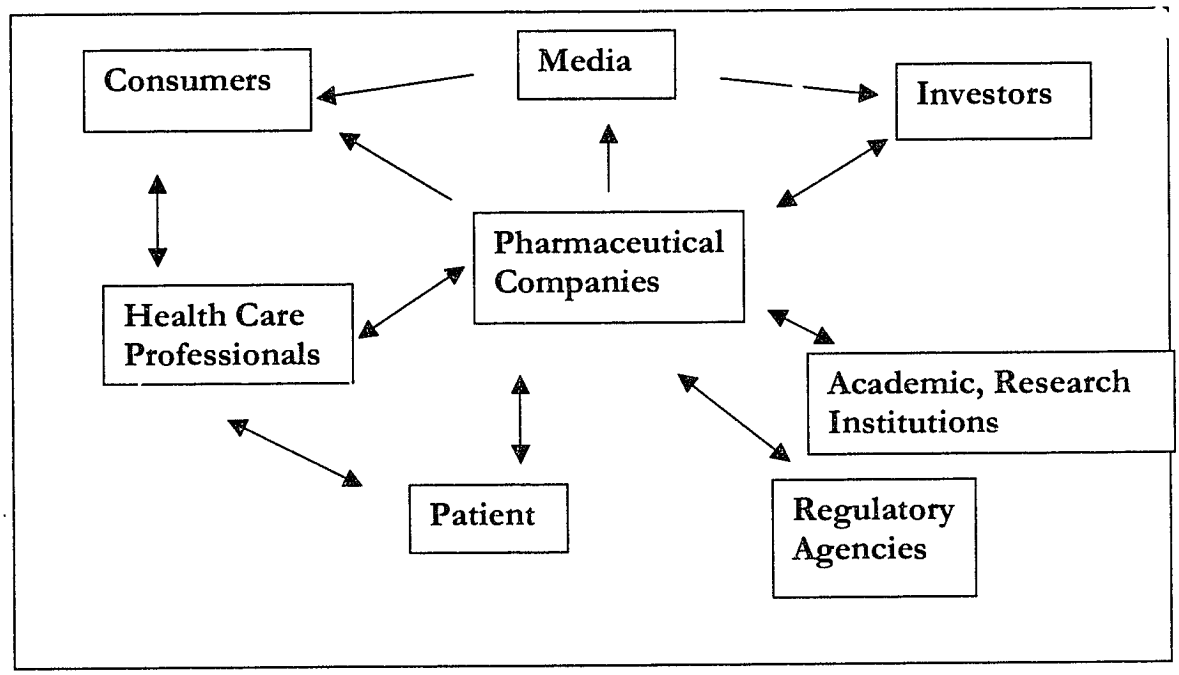
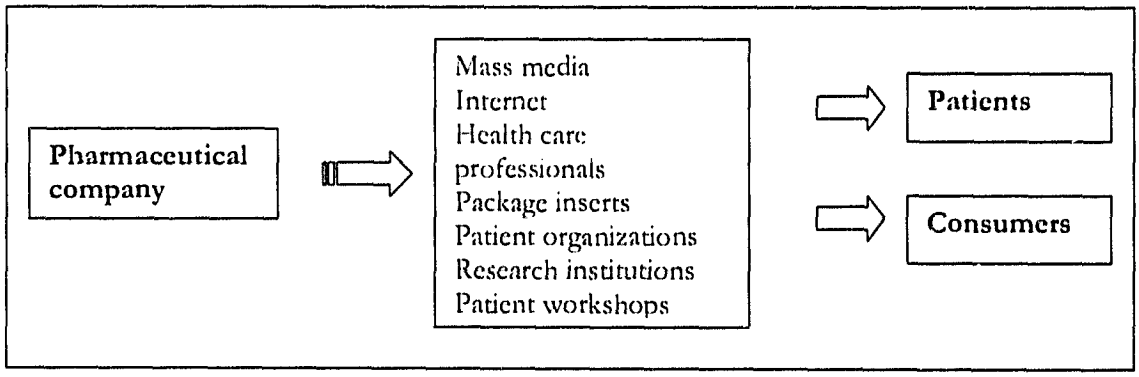


Figure 6 further demonstrates that the range of channels used by these companies to communicate with two key publics – consumers and patients – is quite diverse. Consumers are typically the general public, many of whom use general health-related consumer products (toothpaste, vitamins) while patients are typically those receiving medical treatment. More detailed examination of one public or stakeholder group, which is, at the same time, a channel to reach consumers and patients is the health care professional constituency. This is a group with which pharmaceutical companies have strong communication ties. In collaboration with this group, the drug companies are able to test out their new drugs, learn about adverse effects and essentially promote their drugs. This is a group to which pharmaceutical companies like to pay special attention; they are essentially a key link to patients and consumers.

**Figure 6. Communication Channels with Patients and Consumers**




An examination of the Canadian pharmaceuticals' target audiences showed six categories: patients, health care professionals, the media, consumers, investors, and government regulators. In this section, we focus primarily on the first four. Not surprisingly, the patients targeted are those relevant to the company's therapeutic areas. For example, Pfizer's health information on its website (http://www.pfizer.ca) targets mood and anxiety disorders, heart disease, Alzheimer's, and infections, all areas in which it has pharmaceutical products. GSK, with HIV/AIDS drugs an important component of its product line, directs funds to AIDS organizations around the country. Bayer, interestingly, has a lively section on its website directed specifically to kids called *Kidz Club*. The section is

clearly designed to enhance children's science literacy by providing such elements as science quizzes and ideas for simple experiments. One of Bayer's widely advertised products is Flintstone vitamins for children.

The media are another audience and an important channel to reach other audiences. Positive stories in the media can inform health care professionals and consumers or patients about new therapies. They can also be used to spark investor interest and as a channel to respond to emerging issues (e.g., drug pricing, drug efficacy).

Health professionals are a key target audience and are also a conduit to reach patients and consumers. Reaching out to medical professionals begins early in their career paths. In many cases, drug companies provide "educational support" for medical residents which can include textbooks and reprints, sponsorship of grand rounds, conferences, and dinner meetings. Pharmaceutical manufacturers say that such educational services are an important way to transfer information about drugs and drug safety to busy doctors.

### II.B.4. Communication Strategies.

What communication strategies are prevalent among pharmaceutical companies? In some ways, they do not differ much from other industry sectors but there are also some strategies unique to this sector. Here, we focus on those strategies that are relevant to consumers and patients and provide some assessments of these strategies.

**Health Professionals as Information Sources for Patients and Consumers.** Given that this group, which includes doctors, dentists, pharmacists, and hospital administrators, is critical to reaching end consumers and patients, they are specially addressed and courted by pharmaceutical companies. Doctors and pharmacists are routinely given free samples of drugs by the drug "detail staff". Included in these samples are initial drug write ups, known as "detail aids", that are glossy, eye-catching colorful displays of data, which are used by representatives as sales tools. Some are designed to be left behind with the health care professional while others are not. Skeptics have charged that the latter are more likely to be used to convey misleading claims because doctors cannot examine them carefully or compare them with other information sources or get a second opinion on them. It is up to the physician to judge whether the drug is the correct one for his particular patients (http://www.healthyskepticism.org/editions/IN9903.htm).

For health professionals, some pharmaceutical companies provide convenient and easy-to-access information on-line. For example, Merck Services provide a range of information services for physicians and pharmacists including full prescribing information on all the drugs Merck produces (http://www.merck.com/services/usa/merckservices.jsp.) Similar services can be found on Pfizer's main site (http://www.pfizer.com/hml/hml.html ) or on GlaxxoSmithKline's site (http://glaxowellcome.ca/en/products/prescription/).

The Merck Manual is another example of an information source available to health care professionals as well as to laymen. The Merck Manual has been published for 100 years on a not-for-profit basis and is widely used a general medical text. Their latest version of this manual is available free on their website. Merck also hosts a pharmacy benefits program online where "educational programs and sophisticated information systems link patients, pharmacists and physicians together, helping ensure the appropriate use of medication for each individual based upon their health profile" (http://www.merck.com/pubs/mmanual/). On this site, there are different areas for clients, pharmacists and physicians. There is a drug library section that has detailed information on most drugs on the market.

**Media Strategies.** Press releases that tout new drug "breakthroughs" are an old tool in the communications toolkit. Many pharmaceutical companies rely on this approach to get media attention. A Canadian study analyzing health news in daily newspapers and featured in the National Post (June 10, 2002) showed that Canadians "are being oversold on the benefits of drugs". The study, sponsored by the Canadian Centre for Policy Alternatives, examined reporting on five new drugs in 24 English and French language newspapers. It found 82 percent of the stories mentioning benefits but only 18% mentioning possible risks. This shows that many press releases are successfully published with the pharmaceutical company's perspective. No information is available, however, on the total number of press releases sent out.

The perspective from Canadian science journalists provides a different view of news sources from pharmaceutical companies. According to science reporters we interviewed from the Canadian Press, the Globe and Mail, and the National Post, public relations officers from these companies typically inundate reporters with "news story ideas" or press releases with little understanding or concern for the newsworthiness of the item. (Reid, 2002). Pharmaceutical companies' communication officers tend to treat news organizations

as if they were advertising arms but their aggressive promotion simply turns off these science journalists (Reid, 2002).

**Direct-to-Consumer (DTC) Advertising**. Previously prohibited by regulatory agencies, this communication approach is now allowed in the U.S. (the prohibition was relaxed in 1997 by the FDA) and more recently, in Canada. DTC advertising spending has been estimated at almost $2.5B in 2000 in the U.S. (Fintor, 2002). A study by the National Institute of Health Care Management reported that 41% of the overall $17.7 billion increasein 1999 drug expenditures was attributed to sales of the 25 top-selling drugs promoted directly to US consumers. In addition, the sale of these drugs increased by 43% in that year in contrast to the 13% sales growth of all other drugs (Fintor, 2002).

This practice of DTC advertising is relatively new in Canada but it is expected that trends not dissimilar from that in the US will emerge. Pfizer Canada launched direct-to-consumer advertising in 2001 for drugs for Alzheimer's, high cholesterol, and erectile dysfunction (see http://www.pfizer.ca/FAQ).

A study on DTC in the U.S. found that violations were prevalent around "overstatements of product efficacy, broadening product indications, and minimizing risks associated with the product, or failing to provide a balance between information about risks and information about benefits." (Fintor, 2002, 329).

**Use of the Internet.** One notable recent study examined the websites of pharmaceutical companies for consumer information. Seven sites for six medical conditions were selected for analysis, focusing selection only on sites that "contained substantial education material." While no attempt was made to examine accuracy, other indicators of quality were applied including: types of treatment options in addition to medication; extent of effectiveness of a treatment; adverse effects and contraindications; identity, institution, credentials of author; when material was created and reviewed; sources on which claims are based; an editorial board or independent review process; and a privacy policy. (Griffiths, et.al., 2002). Clearly, these indicators reflect a combination of objectives, from patient protection to information credibility.

The study found that these sites contained both positive and negative features. Positive features included the following: inclusion of information on the nature, symptoms

and diagnosis, risk factors and prevalence, management, and treatment of a condition; information about adverse effects, contraindications and use of medications; descriptions of treatment options; and the use of attractive animations and illustrations. All also included links to additional resources. Ownership details were also disclosed as were privacy policies.

Negative features included: lack of information about authors and their credentials; lack of information on key sources of scientific evidence; lack of information on currency of the information describing when the site was updated. Only one site of the seven had information on whether an editorial board had been used or whether the information had been subjected to independent review. Another shortcoming was the absence of information on absolute and relative treatment efficacies. Not surprisingly, the sites also do not provide information on whether there are other sources for similar medication. Provisions for privacy protection are also sometimes inadequate. For example, certain information is only accessible with provision of an e-mail address (Griffiths, et.al., 2002).

Because these sites were already pre-selected to have a certain level of educational quality, these inadequacies demonstrate significant room for improvement.

**Partnerships.** There appear to be two types of partnership arrangements for the four companies we examined. The first is partnerships with academic or research institutions. In the case of Novartis, various Canadian universities have clearly benefitted from research chairs established by the company in its areas of interest including transplant medicine, cardiovascular research, neuroscience, pediatric genetics, and xenotransplantation. The second type of partnership is with disease (or patient) organizations (e.g., AIDS organizations, palliative care groups, organ groups such as heart or lung or liver associations).

Pfizer and Pharmacia Canada have supported an innovative program with arthritis patients where these patients are trained to become instructors of physicians and medical students in musculo-skeletal exams. These patients provide "living lessons in arthritis", supplementing the formal training of medical students, enlightening practicing healthcare professionals and encouraging and informing other patients with arthritis. According to physician participant, Dr. S. Edworthy, "Hands-on learning with people who have the condition has a lasting impact on the professional's knowledge and behavior." (Edworthy, 2002). Better awareness among health professionals of the challenges arthritis patients face

has led to more effective diagnosis. There are currently 12 Patient Partners in Arthritis Program sites across Canada including Calgary, Edmonton, Montreal and Ottawa. The goal is to make this program available at each of Canada's 16 medical schools (Edworthy, 2002).

**Pfizer initiated and supports the work of the National Information Program on Antibiotics (NIPA).** NIPA is a group of national health organizations such as the Canadian Medical Association and medical, pharmacy, and patient groups that have joined together to promote appropriate use of antibiotics. This is an example of conducting an information and public education campaign on wise product use, an approach which has long term benefits for the company, its stakeholder groups such as consumers and patients, and for the general public The objective of educating the public on proper antibiotic use was designed to help reduce Canada's growing antibiotic resistance problem. NIPA has developed brochures, posters, a website (www.antibiotics-info.org), consumer advertising, an annual Antibiotic Awareness Week in January, and tools for doctors such as a "Non-prescription pad" that explains why an antibiotic was not prescribed and what the patient can do for symptomatic relief. This program was evaluated after the Awareness Week in January, which demonstrated increased understanding of the issue among Canadians.

**Sponsorships and Donations.** In recent years, the issue of accessibility of drugs for developing countries has received widespread coverage. Public pressure has been exerted by governments and patients , aided by NGO's, to have pharmaceuticals address this issue. In response, Bayer has cooperated with WHO on a "Medicines for Malaria" venture to develop a new malaria medicine based on the active ingredient artemisone for which Bayer holds patent rights. It has also supplied its drugs free of charge to WHO to combat African sleeping sickness (see http://www.bayer.ca).

Bayer Canada has **another notable sponsorship initiative, which is not directly tied to its products: this is its support of science education initiatives.** The company has supported the Ontario Science Centre as well as the *Scientists in the Schools* program with NSERC.

To address the challenge of industry credibility, pharmaceutical companies sometimes team up with other health institutions to promote "public education" on an issue. For example, U.S.-based Eli Lilly sponsored a promotional campaign designed to reach 93 percent of American adults. According to a Wall Street Journal article (April 15, 1993), Eli

Lilly paid between $3-4 million for a National Mental Health Association (NMHA) three-week promotional blitz. The goal was to encourage the public to seek professional help for depression. Eli Lilly, the manufacturer of Prozac, also gave the NMHA nonprofit organization $500,000 to conduct a nine-month public education program to identify potential candidates for treatment of depression (http://www.chiroweb.com/archives/17/07/15.html ). While the promotions did not use the name Prozac or Eli Lilly in their main texts, the company was credited for paying for the advertisement.

Sponsorship and donation activities are also common across companies in their headquarter communities.

**Advisory Committees.** Pharmaceutical companies like to make use of advisory committees to lend credibility to their products and their promotion, to gain insights into how their drugs can be more effective, and to gain advice on clinical studies design. These advisory committee meetings are held in world-class hotels and the advisors are paid handsomely for their advice. Recently, Forest Laboratories Inc. hosted such an advisory session at the Plaza Hotel in New York, to discuss depression and their drug, Celexa in a four hour session. After an overnight stay, breakfast and lunch, each doctor was offered a token of Forest's appreciation: a check for $500 (Brubaker, B. 2002). A study published in 2000 in the journal of the American Medical Association concluded that doctors who have regular interactions with drug companies are influenced in their prescribing behavior by the gifts and perks they accept.

### II.B.5. Lessons from the Pharmaceutical Front.

In assessing the communication efforts of the pharmaceutical industry, a mixed-performance record is evident, with examples of a few good practices and other examples of poor communication practices. **One notable best practice is Bayer's investment in science education.** In the same way that some major arts organizations invest in future audiences through audience development programs, for example through provision of visual and performing art appreciation programs for children, organizations involved in the business of science can engage in similar efforts. Bayer's support of science center

programming or scientists-in-schools programs exemplify this forward thinking. This is a practice that is definitely applicable to federal S & T practitioners. For example, how can ministries be further involved with science education in their respective sectoral areas? How can they be engaged in investing further in the country's supply of S&T human resources?

**Another best practice is more active participation and involvement of key stakeholder groups such as patients and consumers**. For the federal government, multi-stakeholder consultation and engagement has been a long-standing practice, particularly in the environment a d health sectors. Pfizer's arthritis patient inv vement in healthcare professional training which, in turn, improves medical diagnosis and communications illustrates this point. The questions that might be appropriate here revolve around conducting these stakeholder consultations in even more effective ways and finding more innovative ways to engage the general public.

**A third bes practice is engaging in public information and education campaigns which have long-term benefits for the company, the industry as a whole, user groups, and the general public.** The NIPA (National Information Program on Antibiotics) program is a good example. The benefits to the company include safer product use, investor confidence, public goodwill, and potentially, greater product longevity in the market.

On the other side of the ledger, there is evidence to suggest that while regulatory mechanisms mandate the delivery of certain types of information to consumers**, the greater emphasis of the industry has been on promotion**. The International Medical Benefit/Risk Foundation has concluded that the industry's investment in patient information and education is considerably less than their investments in drug development (George and Rabin, 1993).

As pointed out earlier, a number of considerations about this sector including high risk and frequent uncertainty, high development costs, and issues of credibility impose challenges to the industry's communication efforts. The emphasis on promotion has sometimes been to the detriment of more balanced approaches to risk messages, more comprehensive and less biased patient education, and the need for transparency.

On the issue of transparency, some physicians feel that pharmaceutical companies can provide more information than they currently do. Joel Lexchin, a physician and York University professor, had a disappointing experience with a request for more information

from the pharmaceutical companies. He wrote to 12 Canadian pharmaceutical companies, for a list of the randomized controlled trials on the primary indication for each product that were published in English and that were available to physicians at the time the product was first marketed in Canada. A second letter was sent to all companies that did not respond after 5 weeks. Only one company, GlaxoSmithKline, accurately complied with the request, sending material on one study for one of its products when asked for three (Lexchin, 2002). Lexchin suggested that pharmaceutical companies can do more in this regard and should make available this information on their websites for the health professionals.

**A best-practice model recommended for the issue of drug safety** is well worth considering here. As discussed in Vogt (2002), "a key concept of this new approach is a recognition that it is primarily faulty systems, not faulty people that create error or poor outcomes" (p.316). In the context of drug safety, harm to a patient inevitably means everyone involved is also harmed, from the manufacturer to the regulator to the clinician. Vogt promotes the use of complex adaptive systems thinking to address the issue of drug safety and drug safety communications with the observation that "there will be no safe drugs until there is a safer system". This model of systems thinking is underpinned by an approach to risk communication that is also system-wide and integral to all stages of drug development, approval and marketing. This requires nothing less than involvement of all stakeholders in the process. The principles underpinning risk communication within this systems approach are presented below:

- There cannot be a safer drug until there is a safer system.
- There cannot be a safer system until patients and all stakeholders are equal partners, actively involved in the design and communication of benefit-risk information.
- Paternalism must be eliminated.
- The expertise needed for determining acceptable benefit and risk is dispersed throughout society (and not confined to 'experts').
- Patients and all stakeholders serve as both teachers and learners.
- Patients and all stakeholders need to be involved in the: identification of the learning needs and goals; the educational processes and the evaluation of the outcomes.
- The action of one stakeholder or group changes the context for all the others. Individual actions are interconnected.
- Patients, the system's end-users, must be involved in the continuous feedback and redesign of the evolving drug safety information systems.

- While companies have an important role to play in drug safety information, assuming this role is much more effective in partnership with its various stakeholders.

Certainly, in the areas of controversial science such as climate change or biotechnology, the need for the federal government to look at more systemic approaches to communication is even more critical. This is brought about because of the increasingly interdisciplinary nature of these subjects, the consequent demand for an interdepartmental regulatory approach, the embedding of science in a host of other socio-political and ethical considerations, the range of risks and uncertainties, and the increasing involvement of a wide variety of interest groups.

***Table 1: Profiles of Four Multinational Pharmaceutical Companies' Canadian Operations.***

| Comparison Areas | Pfizer | Bayer | *GlaxoSmithKline (GSK)* | Novartis |
|---|---|---|---|---|
| **Size** | Largest Canadian pharmaceutical; 2000 employees | 2100 employees; $50M annual sales | 1800 employees; $100M R & D | About 600 employees including 200 sales reps |
| **Products** | Animal health; consumer products; prescription pharmaceuticals | Consumer healthcare | Prescription medicines; vaccines; consumer, nutritional healthcare | Animal health; ophthalmics; pharmaceuticals |
| **Health information: target audiences** | Heath care professionals; consumers | Consumers; kids | Healthcare professionals; patients in therapeutic areas | Patients in therapeutic areas |
| **Partnerships** | W/ community groups in headquarters location; w/ government (Ontario Sci-Tech program); w/ Active Living Alliance for disabled; partnerships in therapeutic areas (w/ Alzheimer Society of Canada) | | W/ Canadian Hospice Palliative Care Ass'n; | With selected Canadian universities to establish research chairs<br>With Health Partners Int'l to provide medication, supplies to support relief efforts internationally |
| **Donations** | | Focus on support of science education for children (e.g., to Ontario Science Centre, Scientists-in-schools program w/ NSERC); support of National Chemistry Week;<br>United Way support | Focus on innovative programs projects targeting groups of people living with HIV/AIDS; Hospice Palliative care program. $6.5M annual donation or 1% pre-tax profits | Children's healthcare & education; patient advocacy groups and agencies involved w/ women's health, oncology, cardiovascular diseases; community-based groups/org'ns in company headquarters area; academic support areas; product donations |

| | Pfizer | Bayer | GlaxxoSmithKline | Novartis |
|---|---|---|---|---|
| **Notable public information or communication programs** | National Information Program on Antibiotics (NIPA, to promote appropriate antibiotic use)<br>Searle/Pfizer Patient Partners Program in Arthritis: trains arthritis patients to become instructors of physicians and medical students in musculo-skeletal exams. Health professional awareness contributes to improved diagnosis. | | | |

# Part II.C. Good Chemistry: *Responsible Care*™ and the Canadian Chemical Industry

## II.C.1. Program Background.

Responsible Care™ is an intra-sector system of self-regulation—conceptualized as an ethic and backed by codes of practice—adopted by the Canadian Chemical Producers' Association (CCPA) in 1986. Embedded in this code of performance is a set of communication practices based on the principles of dialogue with communities and an advisory system designed to maintain and enhance performance standards.

## II.C.2. Impetus for establishing the Initiative.

Some of the most striking and disturbing industrial accidents of the twentieth century—Bhopal, Love Canal, and Torre Canyon—were directly related to operating practices of large national and multinational chemical companies. Bhopal involved a gas leak from a Union Carbide plant in Bhopal India which caused massive civilian casualties and injuries. Love Canal involved the discovery of 42 million pounds of toxic chemicals buried beneath a residential neighborhood in New York State in 1978 while Torre Canyon in the UK involved a major oil spill.

Immediate public outcry regarding the realized risk involved with the production of chemicals, together with ongoing questions about the health and ecological impacts of incidents & the life cycle treatment of chemicals raised possibilities at the very least about much more stringent government regulations; at worst, the very existence of such industries were in question. In addition, the industry faced barriers for raising capital, uneasy communities, higher incident response costs, diversion of management time to crisis control, along with the erosion of employee, customer and shareholder confidence in the industry (Canadian Chemical Producers Association, 1996d, 2000). Put together, these factors highlighted the necessity for a reconsideration of the general direction for the industry. Thus was born the Responsible Care program.

## II.C.3. Program Features.

All members of the CCPA are formally bound as a condition of membership to the programs and policies of Responsible Care™, though various companies are at different

stages in their implementation of the codes of practice. Currently, the 67 Canadian member companies of the CCPA have adopted the Responsible Care™ ethic (Figure 7). Reports suggest that upwards of 98% of CCPA members are verified, re-verified, or currently in the verification process (Fairley, 2000).

The codes of practice are the tangible steps member companies must adopt to implement the Responsible Care™ ethic. The codes of practice are divided into six categories addressing: (a) community awareness and emergency response, including policy on the community's right to know; (b) research and development (R&D); (c) manufacturing; (d) transportation; (e) distribution; and (f) hazardous waste management (CCPA 2000d). As the breadth of these codes illustrate, the responsibilities inherent in Responsible Care span the total life cycle of products, from their beginnings in the laboratory to their ultimate disposal or destruction. These codes do not just define what is expected of each member company; they spell out the criteria by which the company must evaluate progress and results. Member companies get support from the CCPA for implementation, including the provision of seminars, resources, and additional references on external sources.

**Figure 7: The Responsible Care™ Ethic**

- We are committed to do the right thing and be seen to do the right thing.
- We are guided towards environmental, societal, and economic sustainability by the following principles
- We are stewards of our products and services during their life cycles in order to protect people and the environment.
- We are accountable to the public, who have the right to understand the risks and benefits of what we do and to have their input heard.
- We respect all people.
- We work together to improve continuously
- We work for effective laws and standards, and will meet or exceed them in letter and spirit.
- We inspire others to commit themselves to the principles of Responsible Care.

Source: CCPA The ethic and codes of practice of Responsible Care™ Updated 2000

Since the adoption of Responsible Care™ more than fifteen years ago, the CCPA has been recognized by the United Nations with its Global 500 Environmental Award and

cited by the federal government's Green Plan. The CCPA has also noted significant improvements in the public image of the chemical industry among groups such as public servants and environmental organizations (CCPA, 2000).

### II.C.4 Implementation Mechanisms.

The CCPA is a voluntary industry organization. Not all Canadian chemical producers are members of this group and, likewise, not all Canadian chemical companies have implemented the Responsible Care™ program. That said, a large percentage of companies, including all of the largest firms in the country, have adopted and advocate the program.

Once a company has joined the CCPA, it has a period of time to prepare for a Responsible Care™ audit. When the company is ready, a collaborative process headed by the CCPA commences with a variety of participants from the outside community. Typically, a team of four which includes industry experts, community members and activists, visit the plant, inspect the operations of the plant, interview personnel, examine company documents, and consult members of the community. At the conclusion of its investigation, the team writes a report which details where the plant is successful and where it falls short. This report is made available to the company *and* the public. Before the evaluation takes place, a great deal of preparation is required on the part of the company and, upon completion of the evaluation, many plants may still require modifications. A company cannot be "verified" without its passing this extensive process. The CCPA keeps track of industry-wide statistics for all member plants in areas such as accidents in the shipment of goods, worker accidents in the workplace, and total industrial emissions. The tracking and publishing of these statistics are designed to track individual companies as well as total industry performance.

Outside of the local evaluation of specific plants, there also exists a national committee, **the independent National Advisory Panel, which consists of concerned citizens, environmental and consumer representatives, academics, and other relevant experts. The panel has been a central governance unit of the Responsible Care™ program** since its inception and has a broad mandate to bring the views of industry critics into the Responsible Care™ process. The panel's involvement has been key in making sure the guiding practices and codes of practice are followed, but also in making wide ranging suggestions—touted as challenges—for the chemical industry. For example, it was responsible for prompting the CCPA to put funding towards research on the adverse effects

of the chemical industry on long-term human health and for pushing the CCPA to promote and raise awareness in engineering schools of the Responsible Care™ ethic. (Canadian Chemical Producers Association, 1996b, 2000c).

**Communications Approach.**

There are basically two key organizational communicators tied to the program of Responsible Care™: one is the member company communicating with its stakeholder community and the second is the industry as a whole, communicating with its internal and external audiences. The Responsible Care™ program is guided by a commitment to open, public dialogue with concerned publics. One communication tool of the Responsible Care™ program is its published annual reports on the progress of the program and the environmental impacts of the industry (see, for example, CCPA 2000b and 2000c). While the program has not received widespread media attention in the popular press, the CCPA communicates publicly about the program, often to trade journals and local news organizations. The CCPA, and the industry more broadly, have pursued communication strategies concerned with positive media coverage, but, in the case of Responsible Care™, a **striking interest in Community Dialogue, not PR and media relations, has become the central focus of communication efforts**. Local conversations between employees of plants and other members of the community, between activists and corporate executives, or between academics and chemical industry researchers are the types of conversations that Responsible Care™ is most interested in promoting.

One important feature of the communication tactics used by the CCPA is to involve a broad range of publics for any consultative process. The realization that the chemical industry is tied to the interests of a great number of people, some of whom the CCPA might not immediately recognize, leads to the conclusion that **consultation should be set up in a manner so that any interested person should be able to make his views known to the industry**. Rather than having the industry decide whom to consult, all conversations are open to any interested party. In addition, the CCPA makes a concerted effort to accommodate a wide range of industry critics in its Advisory bodies (CCPA, 2000b). Some critics on the current Advisory Committee include the head of a citizens' group in Toronto concerned about the rail transport of hazardous materials and another lay citizen, a teacher-librarian interested in education and environmental activism.

Responsible Care™ is particularly concerned with communicating the actual risk of operating chemical plants in communities. The Responsible Care™ ethic states that concerned stakeholders "have the right" to fully understand the risks and benefits inherent in working with chemicals. This involves a great deal of sensitive communication at the community level.

Dow Chemical Inc. is a member of the CCPA and a strong proponent of the Responsible Care™ ethic. One of Dow's major sites is their plant in Fort Saskatchewan, located on a site of more than 2000 acres and producing basic chemicals and plastics for a wide variety of commercial purposes. The Advisory panel for Dow's Fort Saskatchewan plant has 16 members representing a wide range of community members including high school students, both rural and urban residents, ministers from local parishes, and a designate from the region's health authority. Panel members sit for two-year terms. The plant manager and representatives from the communications and the health and safety areas of the company attend as source of information but not as active members of the board. An outside consultant, charged with facilitation, administers the meetings. The community advisory panel itself is responsible for selecting future members of the group and has the broad mandate to set agendas, to request information from Dow, and to recommend changes to the operations, community relations, or any other aspect of Dow's operations.

In the past, the panel has discussed issues regarding the particular operations of the plant and its effect on the community as well as broad topics like the Canadian chemical industry's position on climate change. Although the committee's recommendations and positions are not binding on Dow, the broad representation and active participation of panel members makes them difficult to ignore. In Fort Saskatchewan, members of the committee participate in the Responsible Care™- mandated verification audits of the plant every three years (Tsang, 2002).

Chemical plants, in their verification process, have to describe the "worst case scenario" they could possible face and how they would respond to it. The CCPA also urges companies to work collaboratively with local governments and other industry to build, and regularly revisit, strong and realistic community emergency preparedness plans.

**Problems Encountered.**

Responsible Care™ has a number of positive features and, through its implementation, has been able to bring about some important changes in the industry, but it is not, by any means, a perfect system. One inherent problem in involving a large number of participants in a public consultation process is that, even with the best of intentions, some voices will not be heard and will not have the same persuasive impact. While Responsible Care™ looks to solutions that are broadly acceptable to large groups of publics, **there may be inevitable tradeoffs between the interests of some groups and the interests of others.** Such difficulties may be minimized by having diverse interests represented on the Advisory Committee and by providing opportunities for regular dialogue with each other and the company.

Not every chemical company is a member of the industry association. **Companies outside of the association have no incentive to follow the high standards that the CCPA sets for member companies**. The cost of setting up and evaluating such standards and programs are not passed on to non-members, yet the benefit of a more positive public image for the industry is.

A small chemical company which has a significant environmental impact and which rejects membership in essence becomes a "free rider". **Like any voluntary regulatory regime, there is opportunity for companies to slip through the cracks.** The problem is framed this way by Brian Wastle, the Vice-President at the CCPA in charge of Responsible Care™ , as described in a trade journal interview:

> Wastle says CCPA has tweaked its message to acknowledge that hundreds, perhaps thousands, of small chemical operations are not part of Responsible Care. CCPA no longer asks the government and the public to accept that the chemical industry has cleaned up its act, he says. Instead, CCPA asks them to give a break to the "75 leading-edge gold-plated companies that practise Responsible Care (Chemical Week, 2001).

**II.C.5 Lessons Learned.**

The CCPA reports that, among its member companies, there has been a 62% reduction in emissions since 1992; frequency and severity of transportation incidents have been reduced; and the industry has also reported benefits in the areas of reduced insurance costs for some companies and improved financing opportunities (Canadian Chemical

Producers Association, 1995, 1996a, 2000a). The voluntary regulatory scheme as an alternative to government regulation has allowed the industry to set its own targets for a variety of safety and emissions levels and devise ways to achieve them. **The influence of this self regulatory scheme was demonstrable when the Canadian government created a Major Industrial Accidents Council of Canada headed by the CCPA to design and implement the code of practice the chemical industry already had in place,** a recognition of the high standards already promulgated by the industry itself. **In essence, this self-regulatory approach is a best practice approach as it ties communication with performance, incorporating notions of life-cycle stewardship of products, a precautionary approach to risk, an accommodation of all stakeholder viewpoints, and the use of mutual assistance and peer pressure among members.**

### II.C.6 Feasibility of Application to Government.

Responsible Care™ was initiated at a very specific historical point and responded to a crisis for the Canadian Chemical industry that was acute and, in its detail, quite particular. With this in mind, it is still possible to apply some of the approaches in Responsible Care™ to address broader concerns.

Some of the most useful examples of the broad applicability of the Responsible Care™ program are **the Advisory Committee model for in-depth public consultation at both local and national levels** and **recognition of the "neighboring communities' right-to-know" approach to risk communication and consultation.** Many industries have devised approaches to dealing with the concerns of a wide range of community stakeholders. While these efforts might be productive in the short term, interested publics with more wide-ranging and long term concerns about the industry likely do not have a way to constructively work with industry to alleviate their concerns. The CCPA both encourages local conversations about the Canadian Chemical industry and creates a national forum for similar discussions. The national independent advisory panel the CCPA has set up for the evaluation and development of the Canadian Chemical industry has is positioned to critique and challenge the industry without any fear of reprisal on as broad range of issues as they see fit. Such a committee would be a strong benefit to any contentious, controversial, scientific or technological development or group of industries.

The public consultation model that invites diverse community stakeholders to the table to openly discuss issues of potential risk is another feature of Responsible Care™ that could be applied widely. This approach is codified by the CCPA as the "Community Right-To-Know Policy" (Figure 8).

**Figure 8: *Responsible Care* Community Right-To-Know Policy:**

The Canadian Chemical Producers' Association recognizes the need and right of the public to know the risks associated with the operations and products present in or transported through communities. This is explicitly expressed in the CCPA's Ethic of Responsible Care, which outlines the following relevant guiding principles:

We are accountable to the public, who have the right to understand the risks and benefits of what we do and to have their input heard.
We respect all people.

Principles of a Community Right-To-Know Policy

1. The community is entitled to the same type of health and safety information as an employee.
2. Provision of information to the public must recognize the need to protect legitimate trade secrets.
3. Accurate hazard information shall always be provided regardless of trade secrets.
4. Citizens around company fixed facilities have a right to know the health, safety and environme..tal risks associated with the manufacture, distribution, transportation or products, and the corresponding safeguards.
5. Communities along major transportation routes have a right of access to companies' information on the risks associated with the products and the volume ranges of goods transported, and the accompanying safeguards.
6. Companies will communicate to emergency response agencies the nature, volume and location of materials on the premises.

(Adapted from CCPA, 2000d)

The ability for chemical companies to initiate a long-term discussion of the risks associated with chemical production is not a task that can be taken lightly. The framing of this discussion with the communities' right to understand the relative risks provides for opportunity to share critical information in a way that puts the perspective of the community—and not the company—in the centre of the discussion. As a requirement of the Responsible Care™ ethic, the top executives of all member companies are required to re-affirm and sign-off on all related policies, such as the right-to-know policy, once a year. With high level support, chemical companies are required to engage in regular communication and consultation regarding issues of risk with the communities where they operate. A policy like the CCPA's could be implemented in other industrial and R&D environments where the

operations of a plant or research institute create potential risks that might be confusing and complex. A community-centred approach that focuses on reflexive understandings of risks is a best practice that can be applied generally.

## II.D. Communicating Risk: An Illustration of Problematic Practices

### II.D.1. Background to Dow Corning's silicone breast implants

The case of the Dow Corning's silicone breast implants illustrates the possible downside of poor risk/science communication practices. The Dow Corning example, in terms of the impact on the company, the industry, and especially their customers, was nothing short of a disaster; nevertheless, there are many lessons to be taken from this example which are very relevant to the practice of communicating in the context of scientific uncertainty.

The task of assessing risk, of understanding the likely future effects of a given technology, is far from a certain science. There are many ways to understand and perceive risk and, on top of that, professional risk assessors and the public often have different ways of thinking about risk. Some companies assume that minimizing the *appearance* of risk is a strategy that will result in commercial success in the marketing of products. However the strategy of down-playing risks associated with scientific developments has many long term implications.

Rather than being a detailed history of the Dow Corning Case, the following examples will show some of the shortcomings of Dow Corning's approach and the lessons inherent in them.

**Dow Corning did not have a shared internal understanding of the potential risks of its products.**

Dow Corning introduced silicone breast implants to the general public in the early 1960s and, in their promotional material, made no mention of possible health risks. As the silicone implants were sealed in plastic bags they were able to dodge regulatory and safety testing by federal agencies such as the FDA. No long-term tests of the effects of implants had been completed at this time. Dow Corning did realize that there was a possibility of breast implant rupturing. Although the statistical accounts of how many of the devises

actually rupture (numbers vary between .5% and 5% of cases), by the 1990s, nearly 30 years after the introduction of the implants onto the market, Dow Corning offered to pay for replacement and repair of ruptured or damaged implants when the damaged occurred within 5 years of instillation (Susskind and Field, 1996, p. 123-124). Given the general uncertainty about the health risks associated with the implants, the warranty program raised more concerns than it settled:

> First, the warranty established an implicit standard of performance: implants will likely not rupture for at least five years. Second, the warranty unintentionally placed the company at odds with itself in that it guaranteed that the life of the product was only five years, but the company's own data [which had been made public at regulatory hearings] suggested that its implants, even after 10 or more years, ruptured less than 1 percent of the time... Couldn't the company afford to correct whatever defects were involved? Either the company was not telling the public about the real risk of rupture, or they were incredibly tight fisted. (Susskind and Field, 1996, p. 126).

As it became clear that some of the terms of the warranty were arbitrary and sometimes contradictory, many stakeholders had increasingly grave concerns about the products and their associated risks. Had Dow Corning proceeded with a clear and believable standard for its products' reliability based on the best studies that existed at the time, and had the company been forthcoming with what it knew about the risks, Dow might have gained some credibility.

**Dow Corning focused its media strategy on dismissing and trivializing negative claims about its products.**

When the first lawsuits against breast implant manufacturers gained public recognition in the late eighties (lawsuits had taken place since the early 1980s, but without much media coverage) many people were deeply concerned about new information about the risks of the implants. Dow Corning, in a move that was, given the increasing knowledge of significant risks associated with the implants, almost absurd, set up a corporate telephone hot line that made the following claim:

> "Scientific data and research show that they [implants] are 100 percent safe .... We have done lengthy studies as have thousands of plastic surgeons to show they are safe" (Susskind and Field, 1996, p. 127).

The company also launched a series of assaults, both legal and public, on scientific studies that raised questions about the safety of its products. Rather than recognizing the legitimate concerns of people with breast implants, the company simply denied that there were any grounds for concern. This communication strategy marked Dow Corning's approach to concerned publics until the CEO was replaced in 1992 and the company finally began to move beyond bland assurances of safety. While recognizing that the concerns of its customers would not have solved the problems related to the health and safety of its products, it would have likely created a less hostile environment in a period of increasing public concern.

Now that Dow Corning has recognized the risks associated with silicone breast implants, the company is moving towards reconciliation with its former customers. It can be argued that this move was too late as Dow Corning is now in Chapter 11 bankruptcy, has had a number of high profile court cases against it, and has offered more than 3.2 billion dollars in settlements (see the company's information site http://www.implantclaims.com/ for more details).

### II.D.2 Lessons Learned.

Dow Corning suffered as a company because of its poor efforts to communicate the risks associated with its product. While the general safety of the products was at the centre of public concern and outrage regarding the implants, Dow's inability to present a clear and credible understanding of the safety of their products and the company's dismal failure to communicate about the risks associated with its products exacerbated the situation. Given the company's awareness that its products were undergoing ongoing scrutiny and that customers were increasingly concerned, the company should have (1) **created channels for open discussion of the risks of their products**, (2) **accepted studies that conflicted with their research as worthy of further investigation**, and (3) **taken some account of the risk associated with its products in its public communications.**

# PART III. THE NGO SECTOR

NGOs, or non-government organizations, are becoming an increasingly significant social force as they rise in numbers: there were 6,000 international NGOs in 1990; today there are more than 26,000 (Li, 2001). These organizations are involved in a wide range of science-related public issues, from climate change to biotechnology. For a long time, the focus of many NGO's was on the general area of the environment but since the 1970's, they have focused on more specialized issues (e.g., genetically modified food) and more specific events (e.g., the building of a dam or a pipeline). Their communication strategies on these various topics range from use of the media including effective use of new communication technologies, specific message approaches, to increasingly broad collaboration with other stakeholders.

**This analysis of NGO communication practices on science topics (specifically on climate change and biotechnology) was conducted by doing a literature review, an environmental scan of websites, and interviews with key NGO individuals. Our interviews with science journalists provided a further perspective on how NGO sources were perceived by those who cover them.** In general terms, these organizations' approaches range from confrontation to collaboration. A number of factors were considered: types of information and communication strategies used in relation to three different target groups, industry, government, and the public; degree and nature of collaboration with other organizations including industry, government, and other NGOs; and usage patterns of traditional media and newer communication and information technologies.

Availability of resources has an effect on an organization's ability to set and reach goals and indeed, some NGOs have the resources to take on large-scale communication projects: As Spencer (2001) observed, "Large globally organised NGOs such as Greenpeace and WWF have the scale, budgets, personnel and expertise to match the public affairs efforts of the largest multinational corporation."

However, as successful as some NGOs are, not all organizations have the resources to mount large professional campaigns. In Canada, non-profit support comes from a variety

**Table 2: Sample Methods NGO's use for Communicating S&T.**

| **Environmental Organization** | **Model Practices** |
|---|---|
| **David Suzuki Foundation** | • Partners with a variety of organizations in a number of different educational campaigns: e.g., British Columbia Medical Association Clean Air Project, Ontario College of Family Physicians Air Issues Project.<br>• Has broad range of information on climate change and encourages sending a message to political or business leaders on the website. |
| **ETC (Erosion, Technology and Concentration** | • Effective at collaborating with other NGOs and using the media to mount successful campaigns and influence industry practice and policy. |
| **Greenpeace** | • Media-focused method of communication.<br>• Lobbies industry in a more direct fashion, using stunts to attract media attention.<br>• Holds teach-ins and circulates petitions.<br>• Website emphasizes and facilitates an action-based approach. |
| **Pembina Institute for Appropriate Development** | • Particularly good at partnering with other sectors.<br>• Offers a consulting service. Clients have included the United Nations, federal and provincial and municipal governments, and environmental organizations.<br>• Produces specialized documents such as the Resource Book on Climate Change for Journalists, and educational materials for schools. |
| **World Wildlife Fund** | • Works proactively with industry to reduce greenhouse gas emissions through a program called "Climate Savers."<br>• Climate Change Campaign produces "Cutting Edge," a document that outlines and updates the causes, impacts and solutions to climate change.<br>• Provides educational materials to schools |
| **Public Policy Forum** | • Held two deliberative forums on environmental issues: A Citizens' Forum on Personal Transportation, Energy Efficiency and Environmental Impacts (2002); and Citizens' Forums on Clean Air (2001). |

of sources including corporate and individual donations, private granting foundations, savings from tax exemptions, membership fees, municipal, provincial, federal government grants and contracts, and fees-for-service but the majority of funding comes from government sources (McFarlane and Roach, 1999, 2; 4; see table 2). Environmental groups also rely heavily on volunteers as a resource (Wilson, 1992. 110).

Scientific descriptions of climate change are most often based on the Intergovernmental Panel on Climate Change (IPCC) findings. Risks cited in these IPCC projections include increased droughts and floods in temperate and humid regions, the disappearance of some types of forests, depletion of fish stocks, and sea level rise affecting up to 140 million people in China and Bangladesh. There is often a link to the IPCC website from the sites of NGOs that are working on the issue.

If there is controversy and disagreement amongst climate change scientists, these differences do not appear on NGO sites. Risk is communicated mainly by citing the IPCC report's evaluation of expected impacts on climate change. Some organizations, for example, the WWF and the Pembina Institute, conduct their own scientific research.

Discussions of risks are not limited to scientific issues alone. For example, on the David Suzuki Foundation website, "economic risks" are emphasized: "The threat of climate change to our ecosystems and resources poses significant economic dangers" ("Economic Risks & Opportunities"). The WWF emphasized this type of risk in their "impacts section": "The global insurance industry is already under stress from a series of 'billion dollar' storms since 1987."

Although NGOs usually emphasize risks, they sometimes focus on alternative technologies as solutions. Solutions to climate change are the focus for the WWF, David Suzuki Foundation and the Pembina Institute and these typically emphasize renewable or alternative energy sources. The Pembina Institute especially emphasizes solutions on its website through practical responses to climate change. Information on renewable energy is abundant, including links to other renewable energy sites.

## III.A Media Strategies.

Some NGO's are particularly adept at using the media in getting their message to the public. The icon of confrontation, Greenpeace, has been called the "hired gun" of the environmental movement (Wilson, 1992, 112). This role has been very effective at drawing public attention to selected issues.

One powerful technique is to stage a high profile event or stunt to draw public attention to an issue. Greenpeace, for example, has a reputation for staging protest events and framing issues in press releases that are picked up by the media. As part of these staged events, the use of visually arresting images gets the attention of television in particular, the news medium most frequently used by the general public. Examples include attempts by individuals on tiny rubber dinghies to block whaling vessels (an effective David vs. Goliath image), the use of Frankentony the tiger (a take on Kellogg's Tony the Tiger mascot merged with 'Frankenstein' GM foods) or dumps of various protested products -- from coal to modified soy -- in some public location such as parliament or some politician's residence (see figure 9). It is not atypical for Greenpeace to have its own photographer or video crew to its own staged events so it can provide TV stations with its own videotapes (Wilson, 1992). As Milshtein (2001) observed, "Greenpeace remains media savvy, always trying to create an image and sound byte that will resonate in the public's mind."

Effective use of, or relations with, the media are important for different sorts of goals. The use of the media by Greenpeace and other environmental organizations to mobilize public opinion is one such goal. "NGOs take on specifically global political, ecological and social problems and mobilize a world-wide public against the particularism of national governments" (Demirovic, 2000). Such topics as climate change, biodiversity, or GM food are examples of the increasingly global nature of many science-based issues and the need to mobilize an international rather than a domestic public has become necessary. This has, of course, been made easier by the similarly increasingly global reach of the mass media and the Internet.

When NGO-sponsored events garner the media's attention and heighten public awareness, these can facilitate efforts for the rest of the NGO communities:

> [This media attention] plays a foot-in-the-door sort of role for the entire movement. When you sail a boat into the middle of a nuclear test zone, everybody goes, "Oh my goodness! What's going on there?" And then it gives us all an opportunity to have a dialogue on the subject that might not have existed otherwise. (Joanne Egan, Pembina Institute)

Sometimes, in its bid to push an issue to the front pages or the evening news, the science can be given short shrift. For instance, in the Brent Spar case, Greenpeace staged illegal helicopter landings and other attention-grabbing acts on the rig, causing Shell to back down and accept the NGO's demand to bring the platform back to shore. But it later turned out that Shell had been right all along about the environmental impact it had projected. Greenpeace eventually issued a public apology (Kapstein, 2000; cf. Graafland, 2002).

**A very different approach, one we would identify as a best practice, is the series of seminars conducted by the Pembina Institute for the media on climate change in six major urban centres across Canada in the fall of 2000.** These seminars were notable as a means of educating journalists on a complex subject. It included speakers from both government and industry, giving journalists an opportunity to get specialized background briefings and to consult experts on the issue. Members of the media were provided with the *Resource Book on Climate Change for Journalists,* a document filled with policy and scientific information on the issue. The Pembina Institute continues to make updated electronic versions of this document available to the media.

From the perspective of the six science journalists we interviewed, some specifically singled out sources from the World Wildlife Fund and the Sierra Club as effective in their media approach (Reid, 2002). This effectiveness revolved around knowing to contact the right journalist, "knowing your stuff" or at least having someone available who can explain the finer points of international treaties or regulatory issues, and being an accessible and reliable source. At the same time, common complaints among these science journalists included the blatant "political agendas" of NGOs [an interesting observation considering these are advocacy organizations after all] and their frequent looseness with the science. These journalists maintained that credible scientific evidence is frequently lacking from some NGOs.

## III.B. Message Strategies.

NGO's are adept at rhetorical strategies that are effective in gaining media attention but more importantly, help audiences retain key messages. Some key principles in communications planning include identifying key messages and clarifying what the organization wants the message to accomplish. In an NGO toolbox is the following admonition:

Ideally, messages are educational, motivational, and simple enough to be remembered. Messages can:

- **Educate** your audience (e.g., "Economic diversification keeps communities vital")
- **Motivate** your audience ("Everyone has a role to play in making conservation-based development work"
- **Provide hope** ("We can plan for our future by combining the resources of the environment, the economy and the community". (www.explorecbd.org/tools)

The use of specific rhetorical strategies includes memorable labels. When the NGO ETC (Erosion, Technology and Concentration, formerly known as RAFI, or Rural Advancement Foundation International) was lobbying against the deployment of gene-use-restriction technologies, or the genetic modification of seeds to render them sterile as a means of protecting intellectual property, the issue did not elicit much attention until the organization labeled the technology "*the terminator seed*". In 1995, Greenpeace occupied Brent Spar, a Shell UK oil platform in the North Sea that the company was planning on disposing at sea. Greenpeace argued that chemicals and radioactive wastes were still in the Spar's storage tanks. In the international attention that accompanied this action, Greenpeace used metaphors such as "time bomb" and "toxic cocktail" to help make its case against Shell (Livesey, 2001).

NGO's are also effective at recognizing and capitalizing on images or symbols that "sell". The WWF recently released *Polar Bears at Risk*, a report that emphasizes the risk that climate change poses to polar bears because "the public finds polar bears to be a compelling species and it ensures media attention" (Viet, 2002). The organization has a web-based

Valentine's program that encourages supporters to adopt a polar bear for their loved one (Prowten, 2002).

Other NGO's, on the other hand, especially those that target opinion makers and decision-makers, carefully construct their messages on the basis of what will be received as credible scientific evidence. The Pembina Institute, for instance, tries to present science-based information in value-neutral terms, in explicit contrast to the sort of role played by Greenpeace. "Greenpeace will give all kinds of really good science-based information as well, but our {Pembina} singular reputation is around this sort of good credible science-based, solutions-oriented information, and they have a more mixed approach to things, which is also very powerful." (Joanne Egan, Pembina Institute).

This credible science-based approach is reflected in a recent press release where a policy analyst suggested following the U.S. system for emissions standards (Best Available Control Technology (BACT)/ Lowest Achievable Emission Rate (LAER)): "Adopting a BACT/LAER system will help to ensure that, at the very least, the emission guidelines for electricity from coal, oil, and natural gas are as stringent as possible for each type of fuel" (Pembina Institute, "Level the playing field for emission," 2002). This shows a sophisticated awareness of systems that have been developed for emissions standards. This approach to issues also requires that the organization has economists, scientists, educators, and policy experts on staff, increasing not only its own effectiveness but also its credibility when attempting to influence policy makers.

NGOs have a tendency to deconstruct corporate messages, and industry is finding it increasingly important to acknowledge the impact of this strategy (Boje, 2001). For example, ExxonMobil is well known for its anti-Kyoto stance:

> ExxonMobils' rhetorical task was to turn environmental protection, of the kind envisioned in Kyoto, into the enemy, business and technology into saviors, and environmentalists and governments into incompetent meddlers who would do no good. In the ExxonMobil texts, the corporate rhetor performs this task by wrapping the environmental issue in paradox. From this emerges a "responsible" course of action. This requires that government move to the subordinate role of supporting technology development and more scientific research, if not altogether bowing out. Meanwhile, ExxonMobil is to continue with what it already does voluntarily: contributing to the cause of the natural environment by producing energy-efficient fuels (Livesey, 2002).

Environmental groups continue to lobby against this approach. For example, Greenpeace has recently started a campaign against ExxonMobil. This campaign suggests that the company supported the Bush campaign in order to fulfill its own interests and maintain its anti-Kyoto stance. ("ExxonMobil (Esso) gets what it paid for with new "voluntary" Bush Climate Plan," 2002).

### III.C. Coalition-Building.

Perhaps reflecting the trends toward networking and partnership-building, NGOs are entering into dialogue with a variety of institutions, including those they have been or continue to be at odds with, such as industry. They are also entering into dialogue with a broad range of stakeholders: "Increasingly, . . . some NGOs have been behind the emergence of so-called 'multi-stakeholder dialogues' and global public policy networks" (Hohnen, 2001). It is useful to examine how communication practices might be oriented to these stakeholders as well.

Environmental Defense, another environmental NGO, has worked in a consulting capacity with Dupont, Shell, Alcan Aluminium, BP, Suncor Energy, and Ontario Power Generation to reduce greenhouse gases (Revkin, 2000). The WWF through a program called "Climate Savers" wants to strike deals with leading corporations prepared to make innovative new commitments on climate change. Environmental groups also see value in these relationships with industry.

The David Suzuki Foundation is now actively recognizing industry contributions. There is a link to "Green leaders" which include Canada's Rose Technology; DuPont Canada Inc.; Truscan Property Corporation (Canada Trust's real estate arm); Calgary-based Vision Quest; and Petro-Canada (http://www.davidsuzuki.org). David Suzuki recently emphasized this position in a broadcast interview:

> I believe that because the change towards a sustainable future is an evolutionary process not a revolutionary process, we have to give credit to companies that are trying to do something the right way. So even though a company may still be doing things that we don't approve of as environmentalists, when they make a break and try to change a little bit, they must be recognized and given credit for that. So, for example, when Shell set

> up the Shell Foundation and funded it to the extent of almost half a billion dollars, and said "We're looking into alternate energy," we give Shell a lot of credit for that, even though we know that Shell is still doing bad things in countries like Nigeria, to the Ogoni people, and so on (David Suzuki, *Quirks and Quarks*, CBC Radio One, April 6, 2002).

The World Wildlife Fund also encourages businesses to adopt innovative practices that reduce greenhouse gas emissions. For example, it has entered into partnerships with IBM and Johnson & Johnson to reduce their greenhouse gas emissions (Revkin, 2000; cf. Fialka, 2000). The WWF is also receiving funding from Lafarge, a construction materials company, to provide expertise on rehabilitating former quarries to make wetlands (Prowten, 2002). As their website proclaims:

> WWF is looking for forward-looking companies keen to turn a necessity into a business advantage. We believe there are enormous opportunities for businesses to improve their standing and their bottom line through actions that cut CO2 emissions (http://www.panda.org/climate/).

The Pembina Institute is particularly good at working with other sectors. On issues that are related to climate change, they have worked with industry, municipal, provincial, federal governments and international regulatory bodies, and community groups (through the community eco-solutions program) in consultative ways.

> Multi-stakeholder solutions are definitely something we specialize in. There's a lot of organizations that occupy different spaces along the spectrum in terms of whether they are completely outside the established system, whether or not they work with electoral politics, whether they sit down with governments and sit down with industry or not. There are (some) . . . that never sit down with industry and talk about how they could improve their processes, and then there's us at the other end. But we all occupy an important space in the overall strategy. . . Sitting down with industry is something we have done since the very beginning (Joanne Egan, Pembina Institute).

**Working with other organizations allows expertise and resources to be shared, and deployed more effectively. These alliances also offer the possibility of building consensus over controversial risk issues**, and projecting a more powerful position via a chorus from the same songbook, in contrast to being a solitary voice.

Even groups that have mainly focused on mounting anti-corporate campaigns no longer shy away from the occasional alliance with industry: "Thilo Bode, executive director of Greenpeace International, has emphasized the idea that today's large, environmental NGOs do not see themselves as natural enemies of business." (Kasemir *et al.*, 2001). Pat Mooney, President of ETC (formerly RAFI), described the relationship with industry as "adversarial," yet necessary to both parties: "I don't find that a company operates much differently than a UN agency." He mentioned that it is often the case that industry will engage in "off the record" dialogues with ETC. The function of these meetings for ETC, according to Mooney, is to enable them to get a sense of how the relevant corporations talk to each other in order to "get a kind of perspective on how they deal with things."

**These collaborative efforts are also used by NGOs to pressure industry to be more socially conscious and aware and to be more publicly accountable** (Li, 2001). Because of a growing sense that industry needs to work "proactively to demonstrate behaviour that is perceived to be socially responsible" (O'Connor, 2001), the business world is also finding that business practices and public confidence can be improved through relationships with NGOs: "Companies can develop substantive partnerships with NGOs that share expertise and best practices, and develop long term relationships" (Wootliff and Deri, 2001). Corporations have also turned to NGOs to give legitimacy to their own corporate reports: "Shell made the judgment that it would be more credible in the eyes of its shareholders and customers to involve the NGOs" (Johns, 2001).

Building relationships with other NGO's and other like-minded organizations (such as unions) is also part of this collaborative pattern. . (Moberg, 2000; Mason, 2002) They communicate with each other regularly through e-mail and conference calls and representatives see each other at international meetings. This relationship extends to relations with influential individuals. Mooney said that ETC played a role in initially informing Indian scientist and activist Vandana Shiva on controversial issues in agricultural biotechnology. She is now a very prominent spokesperson and activist on the terminator technology issue (the controversial genetic engineering of seeds for one-time planting by turning off their reproductive capacity).

These collaborations can also extend from informal collaborations and consultations to formal fee-for-service contracts. Some NGOs try to influence policy development by working with international organizations like the UN. For instance, on the issue of terminator technology, ETC had a number of interactions with international agencies such as the Food and Agriculture Organization (FAO) and the UN. As described by Pat Mooney:

> I don't want to be specific here about a specific document. In a field like that [terminator technology], a UN agency, the Food and Agriculture Organization, would be reluctant to produce a document without having run it by us first. We normally would expect to see drafts as they are being developed, more often being brought in earlier than that. We've been asked to recommend researchers to do the documentation, or to comment on the researchers that they've suggested, then to act as formal or informal reviewers of the drafts as they go along, or even to act as formal or informal researchers, with the terms of reference that the actual researchers are given to do their task. They want to be able to say, 'well, we consulted those guys.' (Mooney, 2002)

A fee-for-service connection is also practised by some NGO's. ETC's consulting service has included clients such as the Secretariat to the United Nations Framework Convention on Climate Change, federal and provincial government departments, municipal governments and leading environmental organizations.

**These Partnerships can also have Positive Impacts on the Adoption of More Innovative Solutions**. "Greenpeace in Europe is working to get companies to replace environmentally destructive refrigerants with Greenfreeze" (Hartman and Stafford. 2001). Greenpeace recently partnered with a renewable energy company that expects the majority of its clients to be members of Greenpeace (Bashford, 2001). The World Wildlife Fund has been successful in promoting wind power to several different sectors:

> WWF has been engaging power companies, government ministries, local authorities and the public in developing wind power in the Netherlands. WWF brought together energy companies, financiers, a TV station, a rock music band and government ministries to deliver the biggest-ever leap in numbers of new subscribers for "green electricity" (http://www.wwf.org).

The experience of the Pembina Institute's Corporate Eco-efficiency (recently renamed Corporate Eco-solutions) program underlines the value of dialogue and cooperation in influencing corporate behaviour. This program focuses on helping companies to reduce their environmental impact while they maintain economic efficiency.

> The general consensus is that voluntary measures have failed (but) our Corporate Eco-efficiency and Community Eco-efficiency work . . . has been marvelous. . . . In that part of our organization, we have a whole fleet of M.B.A.s and engineers that have the skills and the tools and that speak the language to be able to go in and actually make those kinds of changes. It makes sense to articulate them in a way that speaks to corporate boardrooms. It's been enormously powerful and it is quite unique (Joanne Egan, Pembina Institute).

**Use of New Information Technologies.**

NGOs have been quite adept at using the Internet in effective ways to promote their messages. For example, they have used their e-mail lists to quickly disseminate information to large numbers of interested people (Li, 2001). Greenpeace has a list of over 5,000 activists "who are prepared to protest against any number of issues, such as the use of toxic chemicals in children's toys to the export of harmful minerals" (Li, 2001).

The Pembina Institute has three listserves with over 10 000 subscribers: a general one on their work, one for educators, and a large one on climate change (Egan, 2002). The WWF also has about 10 000 subscribers to their various listserves (Prowten, 2002). ETC (formerly RAFI), has a listserver that includes close to 5 000 people. The World Wildlife Fund

- won an Internet award for best non-profit site ("World Wildlife Fund . . . ," 2000; "Site of the month . . . ," 1999).
- is also a partner in and helped create the *WildWorld Internet resource* on endangered species ("30," 2002).
- has a password-protected FTP site that allows posting large files to facilitate working with other NGOs and partners on various projects (Prowten, 2002).

The Internet also helps environmental groups to place industry under greater economic pressure. For example, in the U.K. in May 2001, Greenpeace and Friends of the Earth launched a boycott campaign against Esso's and Exxon's opposition to the Kyoto agreement. A website was central to this boycott, an action causing a potential loss of sales for Esso of one billion dollars a year (O'Connor, 2001). When Volvo and its parent

company, Ford, had different positions on Kyoto, Greenpeace drew attention to this on its website (Ball, 2001).

Some websites have a very high level of visibility and are one of the main forms of communication. www.climatechangesolutions.com run by The Pembina Institute, has received over 5,000,000 hits. The web also provides a very important channel for ETC and the terminator technology campaign (Mooney, 2002). ETC's list- serve provides information to about 5,000 people in around 150 countries. Mooney emphasized that a large number of NGO's and media subscribe to their Listserve.

Documents can also be disseminated and accessed through the web: "We have 12,000 to 15,000 computers that come in to download information every month" (Mooney, 2002). Mooney emphasized that a range of organizations are downloading information, about one third, respectively, from academia and governments and corporations.

Linkages can also be quickly established via the web. ETC's website provides links to approximately 1700 other NGO websites.

**Figure 10: Some NGOs' Web and Internet Applications**

- **Timely information dissemination on current issues**
- **Connect, collaborate with other organizations**
- **Highlight performance/non-performance of companies**
- **Lobby legislation in real time**
- **Produce action alerts**
- **Manage shared information databases**
- **Feedback channels through bulletin boards**
- **Direct marketing of products, services, memberships**
- **Provide curriculum resources**

**Another communication approach of NGOs is through public education:**

The past 40 years has seen an explosion in organized groups who have a public education mission. National Audubon Society, The Nature Conservancy, Sierra Club, Trout/Ducks/ Quail Unlimited, Rails to Trails

> Conservancy, National Wildlife Federation and countless other non-profit organizations serve to connect people and nature (Wells and Merriman, 2002).

Here, we distinguish between the use of the media as an avenue for public education (where an organization's messages are filtered) and the production of educational material to be consumed directly by the general public in informal and more formal ways. **The Pembina Institute has been involved in developing curriculum material for use in the classroom. For example, they have produced "Climate Change Awareness and Action," a multimedia tool that addresses both the scientific and social issues surrounding climate change.** Their material tends to come with ready-made overhead slides to facilitate the material being used more easily.

Destination Conservation, an organization in Alberta, has a program that connects environmental issues, education, and economics. Students are taught how to perform an "energy audit" of their school, to suggest improvements, and to monitor the results. The money saved is used to fund further environmental education.

The Internet is often used as a channel for public education efforts. There is a link to climatechangesolutions.com, a "public education tool" on the Pembina Institute website. The David Suzuki Foundation site provides a link to "climate change 101." The WWF Climate Change Campaign produces the Cutting Edge, a "digest of the latest developments in the causes, impacts and solutions to global warming and climate change" (http://www.wwf.org). The WWF also plans to have an "enhanced online program of the materials that currently get sent to schools." The WWF currently sends educational material to 5 000 schools across Canada (Prowten, 2002).

The David Suzuki Foundation is involved in a number of different educational campaigns, and partners with a variety of organizations in this area: Global warming risk to Canadian habitats and species; British Columbia Medical Association Clean Air Project; Ontario College of Family Physicians Air Issues Project; and Quebec Air Issues Campaign.

### II.E. Action Orientation.

A common feature of communication materials from NGO's is their inclusion of mobilizing information, providing numerous opportunities for their audiences to take action. Much of the information that appears on environmental websites and in print materials advocate public actions, from writing legislators to buying environmentally friendly products to company boycotts. **An NGO website providing tools for advocacy has emphasized**

**The importance of "providing hope": "People need to believe there is something they can do that will make a difference today and in the future for their community"** (http://www.explorecbd.org/tools/).

Some actions advocated are general, providing a list of ideas; others are quite specific for the individual:

- Canadian Solutions (co-produced by the Pembina Institute and the David Suzuki Foundation) describes 17 actions Canada could take to help meet its international commitments under the Kyoto Protocol.
- The David Suzuki Foundation site encourages and facilitates sending a fax or email to political or business leaders.
- Greenpeace International has options to take different kinds of global and local actions: "Help stop BP Amoco's plan to build the first offshore oil project in the Arctic Ocean" or a general one: "Send a message to your Energy Minister to ask for the phase-in of renewable energy in your country".
- Greenpeace Canada says you can send Jean Chretien a message: "Canada must ratify the Kyoto Protocol NOW" (see Figure 11).

### III.F. Other Strategies.

There are other strategies that NGOs use to engage the public. The Pembina Institute also does public speaking at community events and conferences across Canada. Greenpeace also sponsors teach-ins, circulates petitions, and holds public campaigns on the street.

### III.G. Lessons from NGOs.

Science communication can be seen as more or less trustworthy, in part based on scientific accuracy. It is possible that ethical responsibility creates a different but related sort of trust. NGOs are frequently seen to be more trusted than government and industry on this

dimension (Wootliff and Deri, 2001). A recent survey "found that organizations such as Greenpeace, Amnesty International and World Wildlife Fund are trusted nearly two to one by the public to 'do what is right', compared to government, corporations and the media" ("Enviro Activists . . . ," 2001; cf. "In NGOs We Trust," 2000; Moore, 2001).

NGOs are well aware of the importance of trust as the foundation of their communication efforts. They are more effective at building trust because they "speak directly to consumers, appealing to emotions through simple and concise themes" (Wootliff and Deri, 2001).

Their media savvy also provides some important lessons. While government agencies will obviously be unlikely to mount the sort of staged events that some NGO's produce, the lessons have more to do with having a good understanding of news values and how the media operate.

NGO's have also been effective in communicating the idea of institutional responsibility. On this, they have been able to use a broad spectrum of creative methods.

> On one end of the spectrum lies the collaborative or cooperative approach. This approach is typified by NGO partnerships with corporations in coalitions to prescribe and/or certify good conduct, such as the Fair Labor Association, or the Global Alliance. Across the spectrum extend progressively more combative or confrontational approaches that seek to use market pressure to change corporate behavior through shareholder resolutions, or consumer boycotts or other campaign protests. At the other end of the spectrum are NGO claims for corporate liability in national lawsuits or through consultations or dispute settlement at international levels (Greenberg and Diller, 2001).

By focusing on institutional responsibility, they have brought home the message that institutions (corporations or government) need to be accountable to more than just the economic bottom line and that such values as sustainability (both social and environmental), social justice, human rights, or equity also need to be considered. There is "an increasing awareness that a company that does not deal with environmental and social risk factors may damage its value in the market" ("Social Reporting," 2001). Greenpeace is considered particularly effective at publicizing issues in a way that threatens to have an economic impact, pushing companies to actively pursue more environmentally friendly processes and procedures (Roellig, 2001). Greenpeace U.S.A., for example, has recently "called on leaders of Fortune 100 companies to clarify their position on the Kyoto Protocol" (Kerlin, 2001).

# PART IV. CONCLUSIONS AND RECOMMENDATIONS: LESSONS FROM THE PRIVATE AND NGO SECTORS

Government agencies, non-government organizations, and corporations might all be communicating on a common subject—in this case, S & T issues—but these are also different organizations with different goals and objectives. As such, their communication strategies may also differ. At the same time, good communications planning and execution have basic requisites that apply to different organizations. These include planning and foresight, implementation of sound communication principles including considerations of objectives, audiences, messages, channels, and key audiences, and evaluation.

There are considerations specific to communications on S & T issues that also need to be considered. These subjects often involve questions of risks and benefits and they depend on a knowledge base that is progressively changing, incorporating varying degrees of scientific uncertainty. They also frequently require "translation" of technical information. These are considerations that need to be factored in to any examination and analysis of S & T communications.

Our examination of private sector and NGO experiences has provided many lessons on S & T communications and we summarize these lessons below.

## IV.A. Communication about Risk – Some New Elements.

The case studies on the pharmaceutical industry and Dow Corning demonstrate a number of elements emphasized in more recent work on risk communications (see Powell and Leiss, 1997). These ideas include the recognition that there are limits to the contribution of science to communication efforts about risk. **Science can be on tap but not always on top on risk issues.** Another element in this newer view of risk is that "expertise" can be distributed more broadly in society and therefore, needs to be redefined (Fischoff, et.al., 1981). This view recognizes that expertise can also reside in users, consumers, patients, those most affected by the risk or those enjoying the benefits of the technology, and these 'other experts' will bring an alternative perspective that can only enrich the limitations of the technical expert.

### IV.B. Some Media Savvy Won't Hurt the Cause.

The NGO community has demonstrated a great deal of adeptness and agility in using the media, both traditional and the new media. Their understanding of ... 's values—what makes a good story, how do the media operate, what are the journalist's needs—combine for a successful formula in garnering media attention and getting their messages across. Provision of some training in S&T communications and in dealing with the media for key agency sources or for agency scientists may go a long way toward more productive media relations.

### IV.C. Integration of New and Emerging Information Technologies Provide Significant added Value.

In this area, both the private sector and NGO's have excelled. Both are on opposite sides of the financial resource spectrum but NGO's have shown what is possible with more limited resources while corporations have also demonstrated what is possible with more. These technologies which include various web-based applications and use of the internet offer substantial cost/benefit ratios over the long run and provide reliable and timely dissemination of information.

### IV.D. More Heads are Better than One.

Advisory panels can be treated as window dressing or they can be used not just for substantive input but as a source of external challenges to the institution. They can challenge the bureaucracy to consider and adopt more innovative solutions and they can bring in fresh viewpoints to an issue. The Chemical producers have been encouraged if not pushed to excel by their Advisory Committee, raising the bar for their performance – and influencing their communications in positive directions.

### IV.E. Applying Systems Thinking to Strategic Communications Planning.

From the pharmaceutical industry case, a lesson provided is the application of the model of complex adaptive systems. There is every good reason to argue for applying this approach to federal department thinking on S & T communications. The value of

establishing on-going connections with all stakeholders and involving these stakeholders in a 'continuous re-examination and redesign of the communication system' is well worth adopting.

Emphasis should also be put on the term *adaptive.* This suggests embedding within the system the notion of social learning on the part of the organization. This assumes that learning takes place on all sides and that reflexivity is a virtue. The process of communicating involves dialogue, listening, and learning from feedback, making mistakes and learning from these mistakes. It is iterative and progressive. A learning organization, seen from a systemic perspective, is a "consummately adaptive enterprise."

The notion of a learning organization can also be expanded to include the organization and its various stakeholder communities and encouraging this larger organizational entity and its members to increase their ability to learn collaboratively. The more they learn, the more effectively they can perform their tasks, and the more effectively they can change their organizational community of institution, stakeholders, and publics. Learning organizations are where people gather to accomplish something that they could not create alone (Senge, 1999; Argyris, 1991).

### IV.F. Factoring in Uncertainty.

This may not be such an obvious lesson from the private or NGO sectors, both of whom have positions to promote and whose communication strategies often require promoting these positions with certainty. But even these organizations realize the virtues of truthfulness and accuracy as solid bases for credibility. Sometimes, this may be forced on the organization by checks and balances afforded by watchdog organizations from the user/consumer sectors. For the pharmaceutical industry, disregard for uncertainty may involve life-and-death situations. The Dow Corning case provides an unfortunate example of corporate dissembling on safety issues.

### IV.G. Leveraging through Partnerships.

Both the private and NGO sectors have increasingly enjoyed the benefits of partnerships and collaborations, recognizing that they may occasionally have mutually shared goals and interests. Partnerships between energy companies and environmental groups have

resulted in mutual benefits. Government agencies have also realized the value of multi-stakeholder approaches to addressing public policy issues. Approaches to public education on a given issue can be a fruitful arena for collaboration. Such topics as natural resource use, health, and environment are rich topics for developing curriculum materials and public education resources.

True partnerships, where the organizations involved actually discuss their common goals and the means to achieve these goals, provides another opportunity to examine assumptions, search for leverage points, and perhaps even test different policy alternatives.

## IV.H. Monitoring Communication Performance.

Shell has demonstrated the advantages of on-going monitoring and comparing performance against objectives. An on-going review of communication performance is vital to a dynamic communication strategy. The identification of metrics for performance and continual assessment of effectiveness should be a fundamental part of science communication planning. Agencies can seek regular input from their various customers, clients, and information users and they can get advice from their advisory committees. The use of focus groups and round tables can also be employed for gaining independent perspectives on S&T communications performance.

## IV.I. The Virtue of Foresight.

NGO's have been quick to capitalize on their understanding of issues on the horizon or on the public agenda, often without resorting to typical monitoring tools such as media scans or frequent public opinion surveys. On the corporate side, organizations like Shell have made smart use of feedback vehicles, scanning services, and opinion surveys to help identify issues on which they and their publics see a need to be engaged on. In the case of pharmaceutical companies, opportunities are available to engage with user/patient/consumer groups and to use databases that can provide projections of trends, for example, via patient experiences. The use of worst-case-scenarios (adapted from the chemical industry), might provide ways of conducting emergency communications. These

mechanisms are also applicable to some federal agencies (such as those dealing with health, environmental or natural resource issues).

### IV.J. Accountability makes for Trust.

Accountability has a number of dimensions. It means being visible, accessible and transparent. Visibility means making your presence known. Accessibility suggests being reachable and comprehensible. Transparency makes clear not just decisions or positions taken but the reasons behind them and the processes by which these policies have been arrived at. Finally, accountability demands making clear the standards of performance being used and whether or how these are being met. Shell and the Canadian Chemical Producers have provided clear systems of accountability by spelling out the standards of performance they expect to met and reporting – through independent assessments – their progress.

### IV.K. Making science and technology more democratic.

The influential UK House of Lords (2000) Select Committee on Science and Technology underlined a crisis of public confidence in science, an observation which may apply to many post-industrial countries to varying degrees. Similarly, the European Commission emphasize .eed to democratize science and governance in the EU in two conferences, with an agenda that explicitly suggested that "the entire process, from problem definition to the assessment and implementation of policy solutions, needs to become more democratic." It further noted that "this need becomes particularly acute when policy decisions are influenced by or dependent upon scientific evidence". (European Commission, 2000).

Many of the practices we have already discussed are part of an ensemble that contribute to this democratization. Public involvement at earlier stages of the innovation process can help to mitigate some of the problems that arise from assuming too much about acceptance of technology in the marketplace. (The public consultation process recently engaged in by Health Canada on the issue of xenotransplantation prior to making a policy decision on whether to proceed to clinical trials is one good example of such earlier involvement). Mechanisms for accountability also contribute to this process of

democratization. Recognition of plural interests and different forms of knowledge and expertise are another dimension of such a process.

A final word about communicating on science and technology issues needs to be said. In many ways, communicating on science and technology is not always about science and technology per se. When publics receive messages about what is ostensibly a topic on a new technology or a scientific explanation for a problem ("what caused people to die in this instance"?) or attempt to deal with these issues, the categories of "science" or "technology" may be furthest from their minds. The questions that may be most relevant in the end have to do with how this affects me, my family or my community; which institutions are providing (or not providing) me with information and whether they are trustworthy; what values underlie a decision (is it fair? are benefits distributed equitably? Is it socially and environmentally sustainable? Does it speak to me as a member of a minority group? Am I able to get the information I need when I need it, in a way that I will find useful?). In short, science and technology are nothing more – and nothing less – than being about how a citizen can make sense of his or her world and how he might live better in it.

**End Notes:**

1. For the purposes of this report, we have adopted the view that "discovery of a best practice is the observation of successful policy implementation in businesses--that is, through case studies--and the subsequent analysis of any general principles that may be derived from the observed experience". (Organization of Economic Co-Operation and Development, 1999).

2. Shell has been recognized in the following ways:

Sustainability Reporting 2001 Award, by the Association of Certified Chartered Accountants (ACCA) U.K. and the Institute of Social and Ethical AccountAbility

Business Week's Awards for Excellence in Corporate Advertising 2001. The judging panel noted that these awards recognize the important contribution the Shell Group is making in pioneering the way large corporations report their performance and impact in economic, social and environmental terms alongside traditional financial reporting.

The Fifth European Environmental Reporting Awards (EERA), 2001 . The European Environmental Reporting Awards (EERA) scheme was created in 1997 to identify the most innovative attempts by European corporations to publicly report on their environmental policy and performance. The aim is to cultivate wider, more transparent and regular environmental reporting addressing a wide spectrum of stakeholders: shareholders, suppliers, employees, governmental agencies and customers. The communications format is typically reflected in the company's annual accounts or as a stand alone environmental report.

3. There are third party groups such as the Health Action International (HAI) http://www.haiweb.org/ that focus on drug safety issues. HAI is a non-profit, global network of health, development, consumer and other public interest groups in more than 70 countries working for a more rational use of medicinal drugs. HAI represents the interests of consumers in drug policy and believes that all drugs marketed should be acceptably safe, effective, and affordable and meet real medical needs. HAI also campaigns for better controls on drug promotion and the provision of balanced, independent information for prescribers and consumers. This group produces print communication such as books (Problem Drugs" Book 1 and 2) and journals (e.g., "International Journal of Risk and Safety in Medicine"). These publications are available in different languages. It also provides information on International Conferences and Campaigns on drug safety and other topics.

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