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Voluntary Environmental Action: A Participant's View of ARET

Prepared for:
Industry Canada
Environmental Affairs Branch

By: David R. Roewade
Environmental Issues
Research Consultant

June 1996

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The views contained in this report are those of the author based on the research conducted and do not necessarily represent the views of Industry Canada.

The following people are acknowledged for their help in producing this report: John Dauvergne, Tony Stone, Erin Windatt and Sally Lerner.

TABLE OF CONTENTS

EXECUTIVE SUMMARY . . . . . Page 2

1.0 INTRODUCTION . . . . . Page 4
1.1 Background . . . . . Page 5

2.0 PURPOSE . . . . . Page 16
2.1 Goals and Objectives . . . . . Page 16
2.2 Methodology . . . . . Page 17

3.0 SURVEY RESULTS . . . . . Page 18
3.1 Survey Question Analysis and Statistical Summary (all Sectors) . . . . . Page 20
3.2 Preliminary Conclusions . . . . . Page 28

4.0 CASE STUDIES . . . . . Page 31
4.1 Selection of Case Studies . . . . . Page 31
Case Study #1 - Shell Canada . . . . . Page 33
Case Study #2 - Placer Dome . . . . . Page 35
Case Study #3 - Crestbrook Forest Industries . . . . . Page 37
Case Study #4 - Dow Chemical Canada . . . . . Page 39
Case Study #5 - Alcan . . . . . Page 41
Case Study #6 - Crown Cork & Seal Canada . . . . . Page 43
Case Study #7 - Alta Steel . . . . . Page 45
Case Study #8 - E.B. Eddy Forest Products . . . . . Page 47
Case Study #9 - Brunswick Mining and Smelting . . . . . Page 49
Case Study #10 - IBM Canada . . . . . Page 51
4.2 Summary Analysis . . . . . Page 53

5.0 CONCLUSIONS . . . . . Page 56

APPENDICES:
Appendix A - Questionnaire
Appendix B - Survey Respondents
Appendix C - Survey Results by Sector
Appendix D - Guideline Interview Questions

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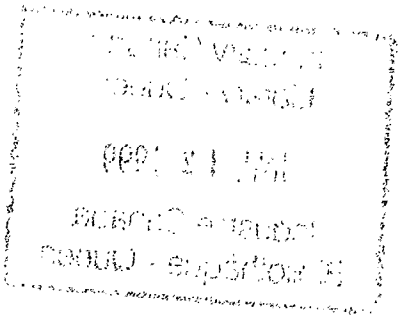

EXECUTIVE SUMMARY

Among industry associations, the public sector and environmental non-governmental organizations (ENGOs) there is an ongoing debate about the effectiveness of "voluntary" initiatives. An important issue that is often overlooked in these discussions is the qualitative side of the effectiveness of non-regulatory mechanisms, i.e. their effectiveness in changing corporate culture to better address environmental challenges. Ultimately, the success of voluntary initiatives depends on their ability to promote changes in corporate behaviour and the concept of continuous environmental improvement.

The Accelerated Reduction/Elimination of Toxics (ARET) program is one of Canada's leading voluntary based initiatives, promoting reductions in emissions of toxic substances across several sectors. In order to determine what effect ARET is having on the way industry conducts its business, this study assessed the relationship of changes made in business practices, subsequent to participants' commitment to the program, to toxic emissions reductions. Approximately 200 questionnaires were sent out to industrial facilities that were participating in ARET to collect information on firms' experiences with the program. Almost half of these facilities, spanning ten industrial sectors, were represented in the responses to the survey. In depth case studies were also conducted with ten respondents to provide a basis for further analysis of the specific effects that ARET was having on business operations.

The majority of survey respondents reported having pollution prevention strategies to assist with implementation of their ARET Action Plans. In addition to this, over a third of the firms covered in this study have experienced other benefits in addition to reducing their releases of toxic substances (e.g. improved employee health and safety, product/process cost reductions through enhanced efficiencies). While ARETs influence on the private sector was in some cases marginal (i.e. relative to what they were already doing in terms of environmental protection), there were, as well, some noteworthy improvements made in the area of toxic emissions reductions. Overall, eight out of the ten case studies provided detailed evidence that ARET is significantly affecting corporate behaviour. Some qualitative results achieved under ARET so far include: increased communications with suppliers, shareholders, customers and the general public with respect to reduction strategies; improved methods of data collection, monitoring and reporting; the creation of internal task forces involving all levels of corporate employees; and enhanced decision making influencing industrial processes, products and practices.

Perhaps an even more interesting role of ARET is that it has fostered a commitment from several participants to continuously improve their environmental performance. Thus, ARET seems to be playing a complementary role to a host of environmental protection mechanisms of a regulatory nature that are utilized in Canada. Furthermore, the effectiveness of ARET has the potential to increase over time as ARET becomes a catalytic factor resulting in strategies aimed at continuously improving corporate environmental performance.

1.0 INTRODUCTION

Environmental management in Canada, at the federal level, increasingly relies on voluntary-based private sector initiatives to prevent pollution and control releases of toxic substances. This evolving management regime involves reporting on usage as well as releases of toxics, tighter timelines to achieve reductions and phase-outs of substances deemed hazardous to health (human and ecosystem), and increased public participation and access to information. Although these characteristics are an important part of environmental protection matrices, industries that use or emit toxic substances are challenged to meet these regulatory objectives while, at the same time, balancing responsibilities to investors and customers and surviving changing economic conditions.

Although the success of voluntary initiatives in reducing toxic releases is due, in large part, to the requirements of existing environmental legislation and the threat of increased regulation, other incentives exist. Other important reasons for companies to manage their chemical usage more responsibly include improving their public image, generating process efficiencies and product improvements, and cost savings from pollution prevention initiatives.

There is much debate amongst industry associations, the public sector and environmental non-governmental organizations (ENGOs) on the effectiveness of "voluntary" initiatives.[1] An important issue that is often overlooked in the discussion is the qualitative side of the effectiveness of non-regulatory mechanisms in changing corporate culture to better address environmental challenges. Ultimately, the success of voluntary initiatives depends on their ability to promote changes in corporate behaviour and the concept of continuous environmental improvement.

An elaborate cross-sectoral initiative that is appropriate to explore this type of qualitative analysis is the Accelerated Reduction/Elimination of Toxics program (ARET). ARET is comprised of a partnership that has involved private, public and non-governmental stakeholders which aims to mobilize industrial sectors through the commitment of individual companies to meet toxics management objectives in a cost-effective and flexible manner. The initiative was born out of a multi stakeholder group called New Directions, which came together in 1990 to explore

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[1] See "It's About Our Health! Towards Pollution Prevention," Report on the House of Commons Standing Committee on Environment and Sustainable Development, June 1995, Pgs. 89 - 93.

opportunities on how to improve environmental decision making by Canadian industries. ARET's main objective is "to quickly reduce or eliminate toxic substance emissions through voluntary action... [which] works by consensus to create opportunities to strive towards this goal."[2]

ARET claims to offer an open and non-prescriptive decision making process that enables industry to achieve toxic substance reductions in a cost-effective manner by allowing investments to be made in the normal course of a company's investment cycle. The effectiveness of this approach as a tool to assist in the promotion of corporate sustainable development is analyzed here to provide some insight on some of the motivational forces behind the toxic releases reductions reported through ARET for the 1988-1995 period.

1.1 Background

This section provides a general background on ARETs focus, industry participation rates in ARET at the industry association level and identifying which categories of substances are of issue for each sector.

The ARET substances list covers over 100 chemicals that were screened by a multi stakeholder committee comprised of public and private sector organizations, environmental NGOs and labour union groups. Five sub-lists were developed which prioritized chemicals that met toxicity, persistence and bioaccumalative criteria. Lists A-1 and A-2 were classed by the ARET technical subcommittee as persistent, bioaccumalative and toxic substances. List B-1 are substances classed as toxic and bioaccumalative, list B-2 are substances classed as persistent and toxic, and list B-3 substances only met the committee's toxicity criterion. {See *Environmental Leaders 1* for further details on these substance lists}

In March 1994, the ARET Secretariat made a challenge to industries in Canada to reduce emissions of ARET A-1 substances by 90% and all other ARET substances by 50% of 1988 levels (or an alternate base year between 1988 and 1993) by the

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[2] ARET, "Environmental Leaders 1: Commitments to Action on Toxics Through ARET" Environment Canada, Ottawa 1995.

year 2000. Since then the ARET group has received 172 action plans detailing firms commitment and strategies towards meeting their targets[3].

The *Environmental Leaders 1* report categorized ARET participants (firms who submitted an action plan to reduce/eliminate relevant ARET substances) into ten industry sectors. For the most part, these sectors are based on industry association classification. With the exception of the government sector, the following list shows the participation rate of industry association members in the ARET initiative as of December 1995:

Sector	Industry Association	Participation Rate
Aluminum	Aluminum Industry Association	80%
Chemical Manufacturing	Canadian Chemical Producers Assoc.	97%
Chemical Specialities	Cdn. Manufacturers of Chemical Specialties	62%
Electrical Utilities	Cdn. Electrical Assoc.	50%
Manufacturing: Other	Cdn. Manufacturing Assoc.	N/A
Mining and Smelting	Mining Association of Canada	63%
Oil, Gas, and Petroleum	Cdn. Petroleum Products Institute	46%
Pulp and Paper	Cdn. Pulp and Paper Assoc.	64%
Steel Production	Cdn. Steel Environmental Assoc.	73%

These participation rates can be considered significant in terms of non-regulatory environmental standard setting. One main benefit for the private sector of having maximum industry participation in achieving these standards i.e. reduction/elimination targets, is that they "can avert coercive government regulations that will hamper the flexibility of decision makers in the responsible firms."[4] It is important to note that in terms of production, most industry associations have almost all of their members committed to ARET. For example, in this context, the Steel Industry has 80% of their production covered under ARET Action Plans. In addition, both the Mining and Electrical Associations non-participants are those members with only nominal ARET emissions which make up a very small proportion of total production for their respective sectors.

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3 The ARET targets are guidelines and some companies have chosen to make more aggressive reduction goals, such as virtual elimination of specific substances by the year 2000.

4 Howatson, Al, "Business and the Environment: Economic Benefits from Environmental Improvements" Business and the Environmental Research Program, Conference Board of Canada, Industry, Science, Technology Canada, March 1991.

The CCPA attributes its ability to achieve such a high rate of participation in the ARET initiative due to their association's 'Responsible Care' ethic that contextualizes voluntary commitments to sustainable development with principles of "public disclosure, purposeful dialogue, a commitment to continuous environmental improvement, and member company pride and peer pressure in the pursuit of emission reduction and enhanced waste management practices."[5] For other industry sectors as categorized by ARET, the challenges involved with attaining full participation rates will vary according to the mix of business operations and types of industrial practices within each sector.

The following graphs show which of the five ARET substance lists are at issue for each of the main eight private sector industries (excluding Government and Electrical Utilities due to nominal or nil emissions). These graphs also illustrate the committed target for emissions reductions by the year 2000. It is important to note that where there are differences of substance focus by industry sector, this is largely due to the relevance of each substance to the nature of business operations for a particular industry. In addition to this, each industry may have different challenges confronting them in respect to reducing/eliminating the same category of substances.

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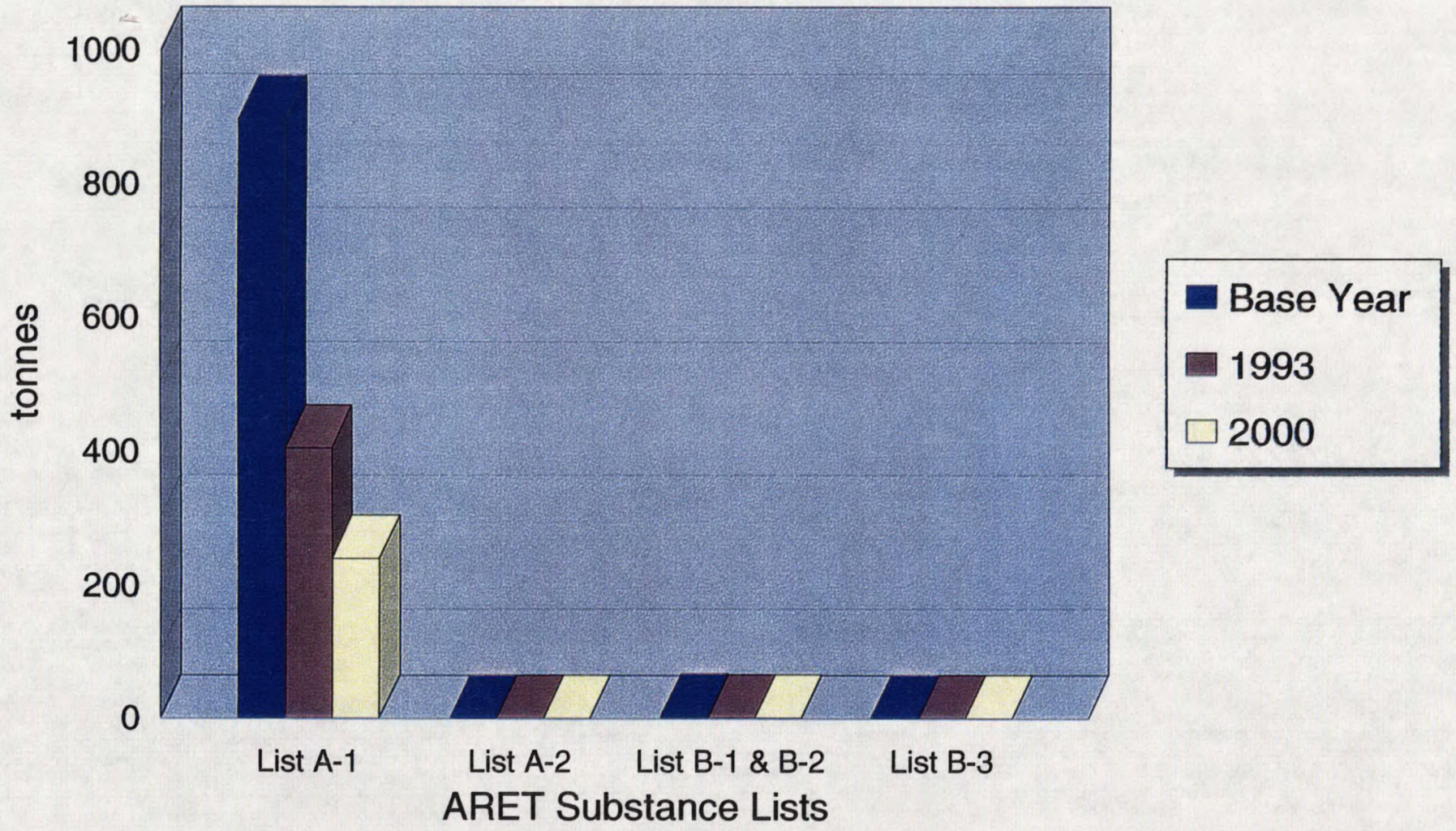
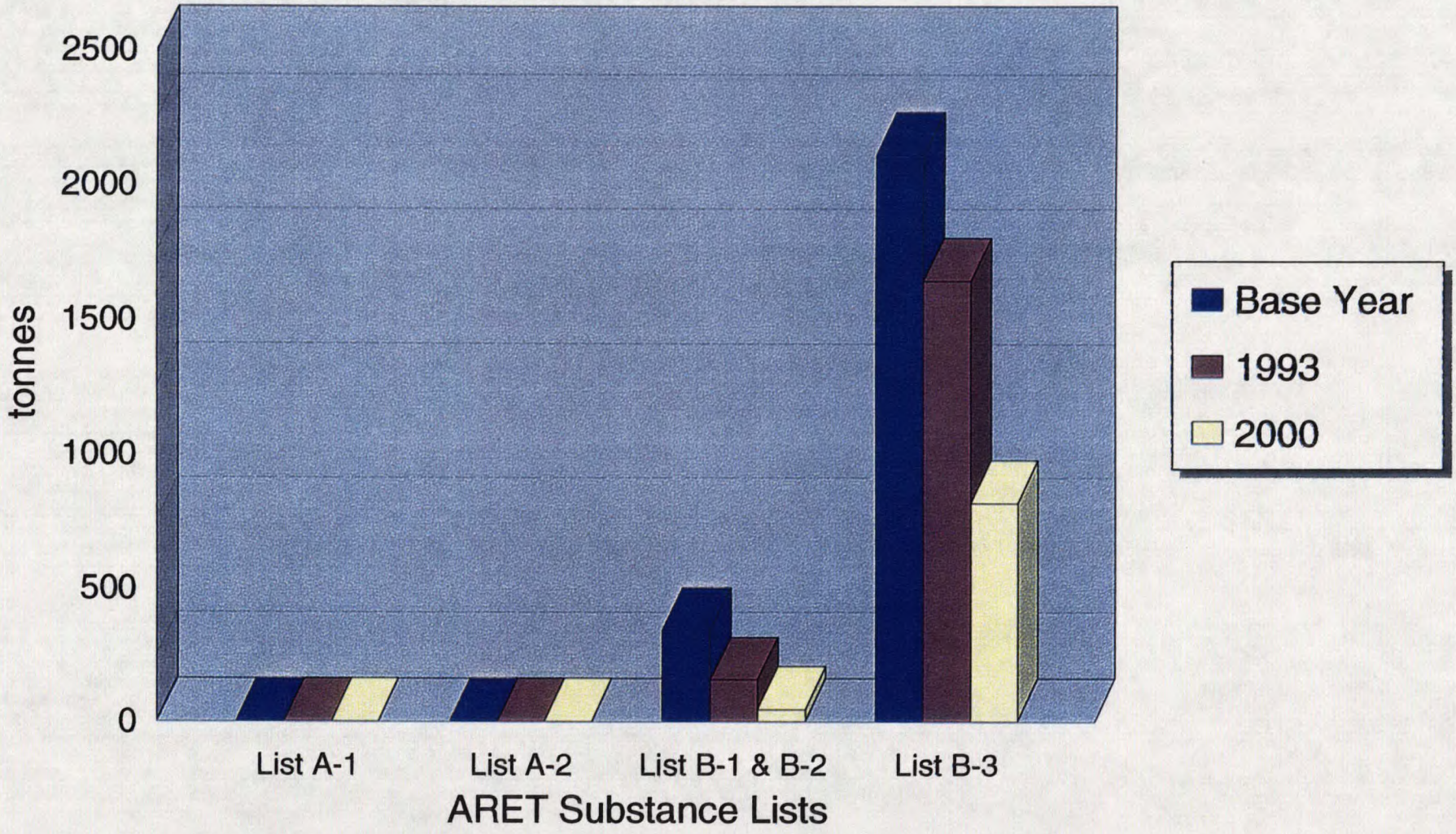
5 CCPA, "Reducing Emissions: A Responsible Care Initiative" 1993 Emissions Inventory and Five Year Projections, Ottawa 1994.

Reductions & Projections in Emissions of ARET Substances by the Participants in the Aluminum Sector



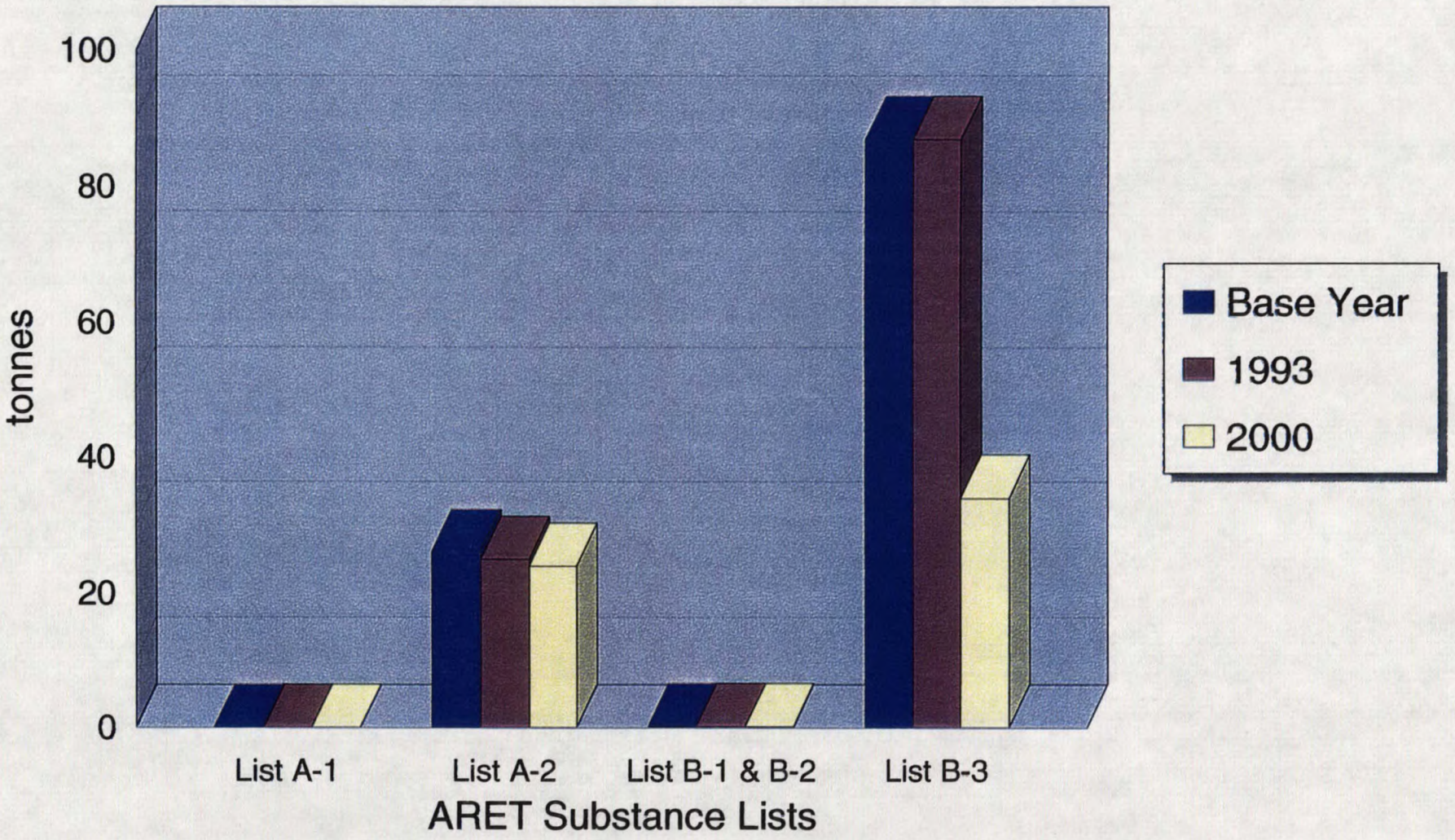
Source: Accelerated Reduction/Elimination of Toxics (ARET), "Environmental Leaders 1", Ottawa 1995.

Reductions & Projections in Emissions of ARET Substances by the Participants in the Chemical Manufacturing Sector



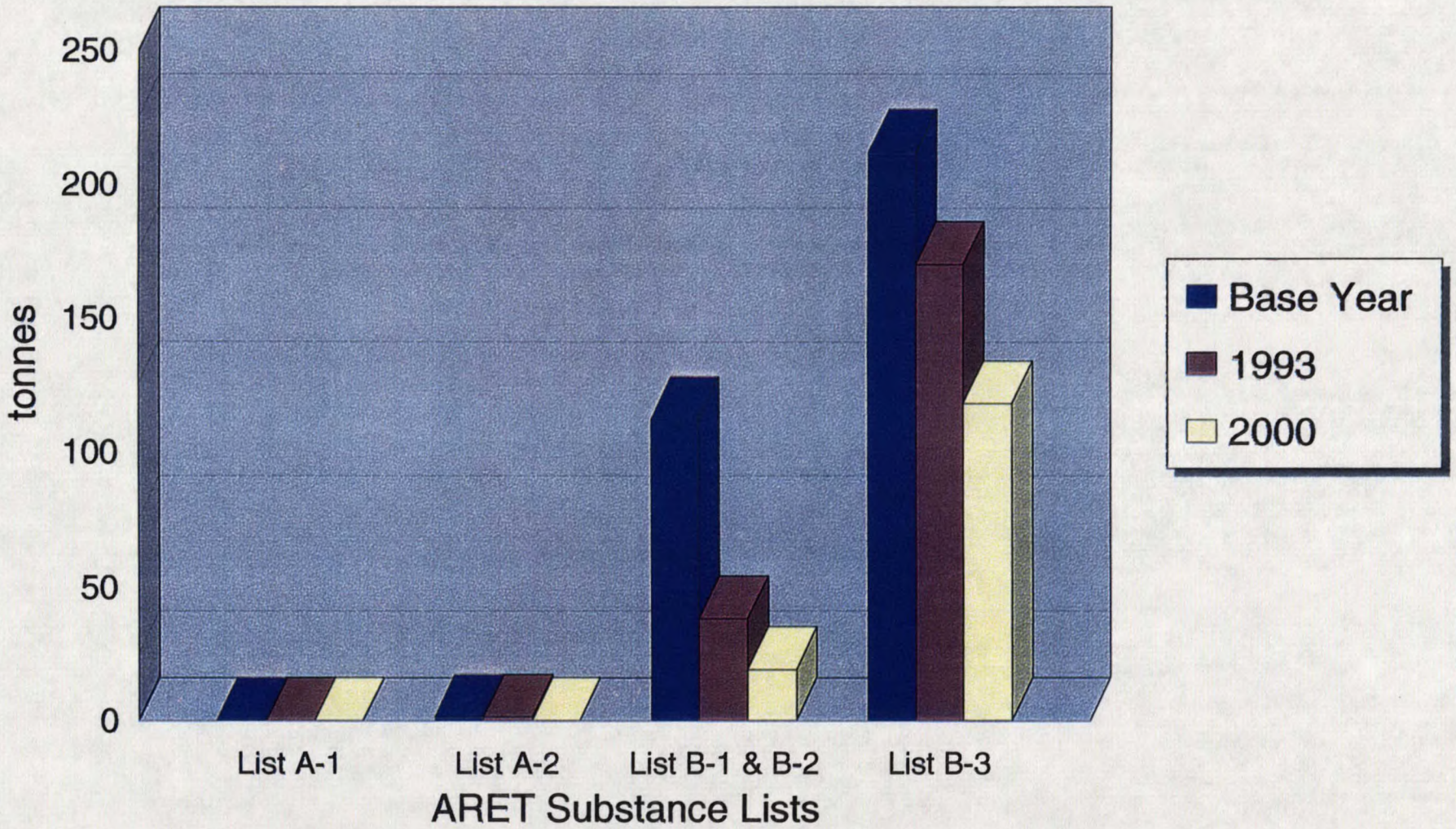
Source: Accelerated Reduction/Elimination of Toxics (ARET), "Environmental Leaders 1", Ottawa 1995.

Reductions & Projections in Emissions of ARET Substances by the Participants in the Chemical Specialties Manufacturing Sector



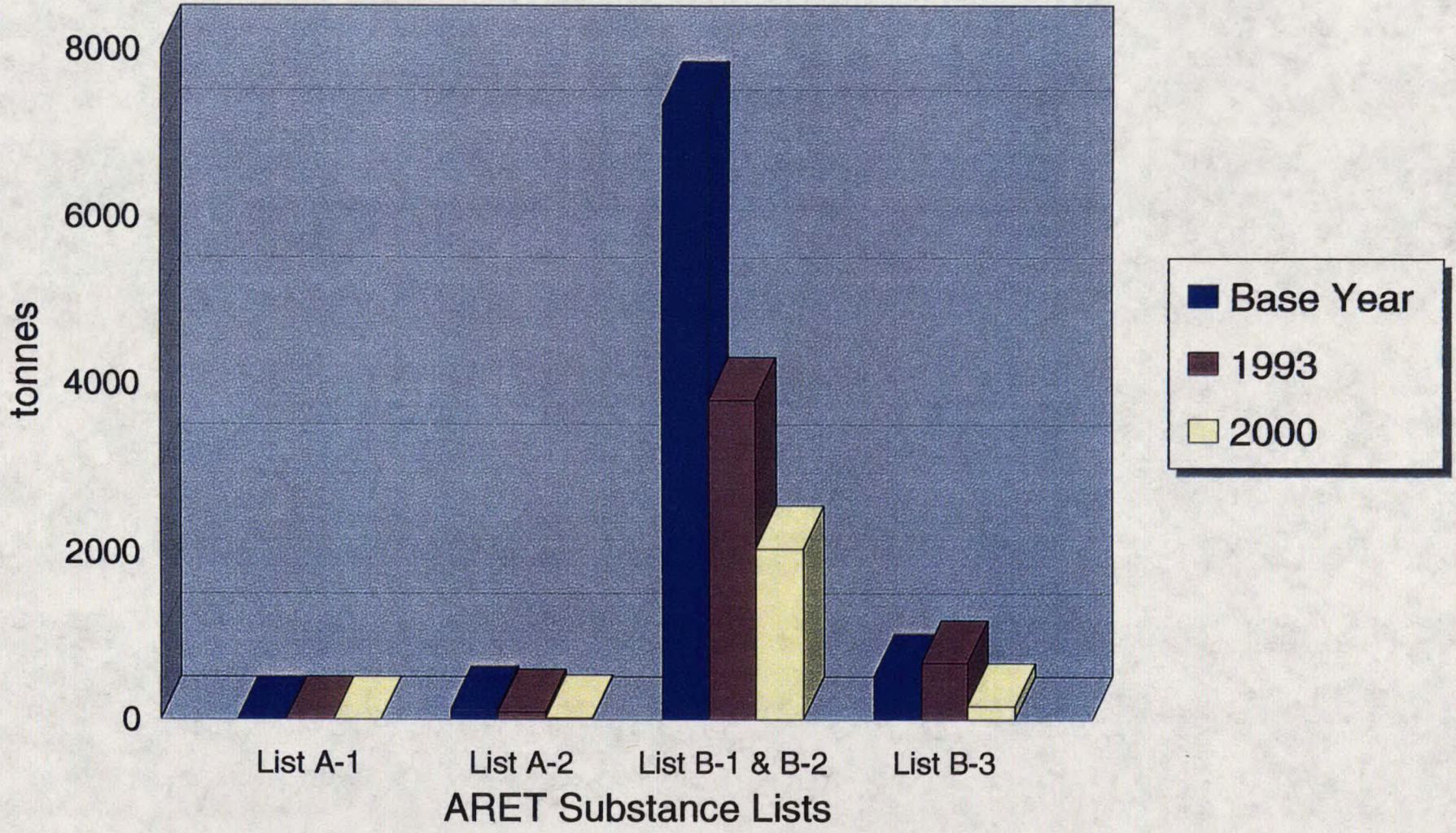
Source: Accelerated Reduction/Elimination of Toxics (ARET), "Environmental Leaders 1", Ottawa 1995.

Reductions & Projections in Emissions of ARET Substances by the Participants in the Manufacturing: Other Sector



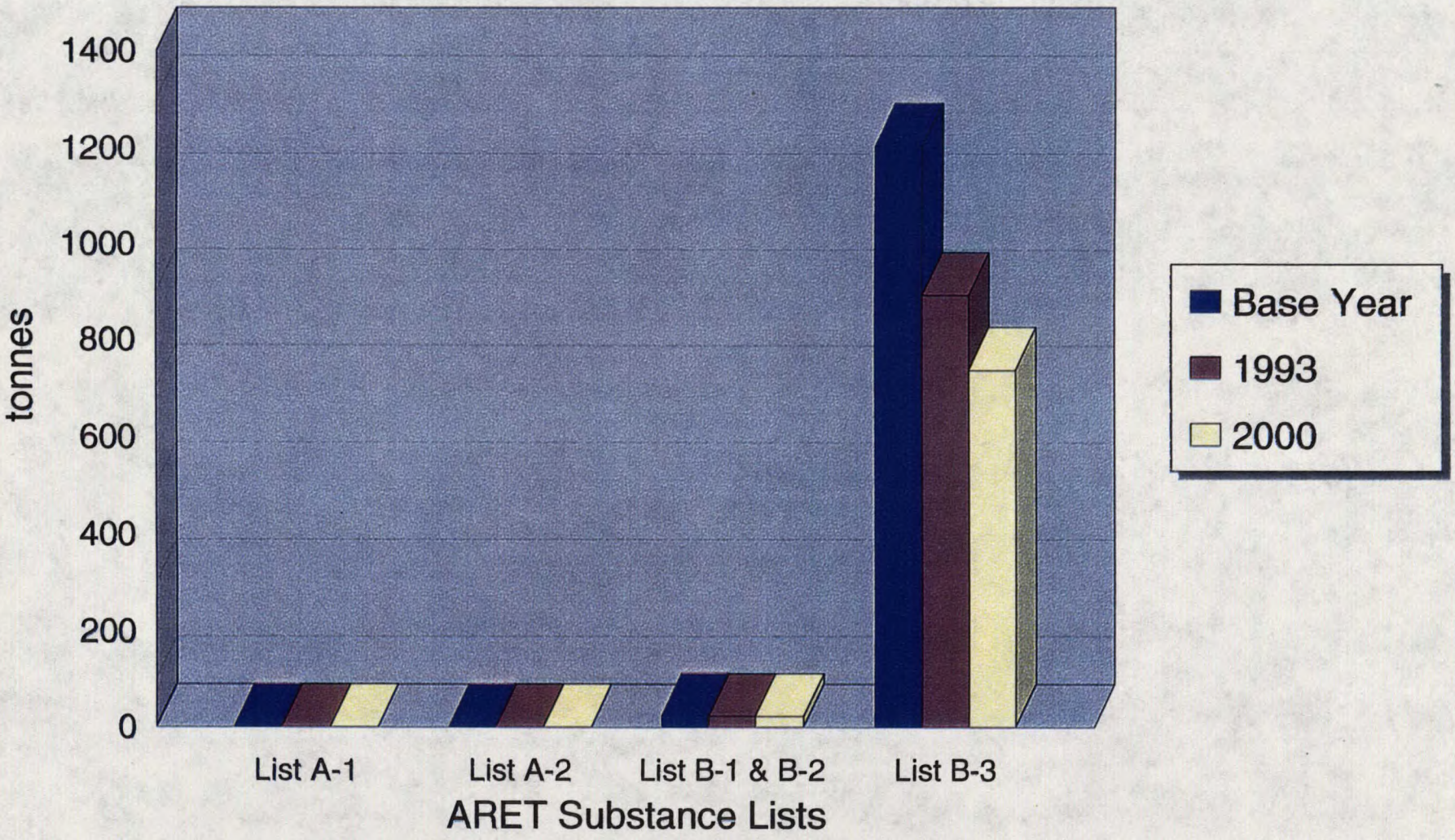
Source: Accelerated Reduction/Elimination of Toxics (ARET), "Environmental Leaders 1", Ottawa 1995.

Reductions & Projections in Emissions of ARET Substances by the Participants in the Mining & Smelting Sector



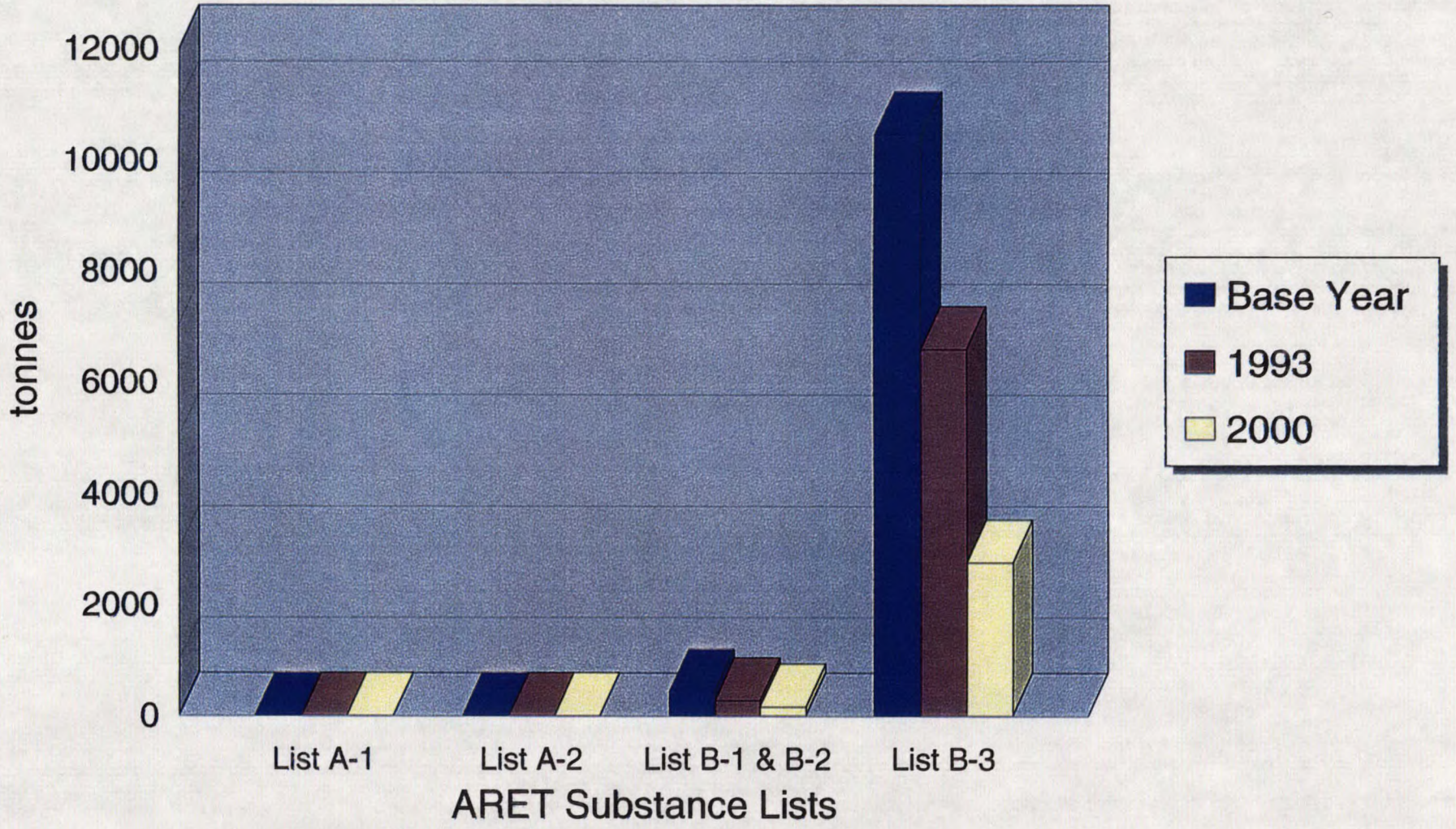
Source: Accelerated Reduction/Elimination of Toxics (ARET), "Environmental Leaders 1", Ottawa 1995.

Reductions & Projections in Emissions of ARET Substances by the Participants in the Oil, Gas & Petroleum Products Sector



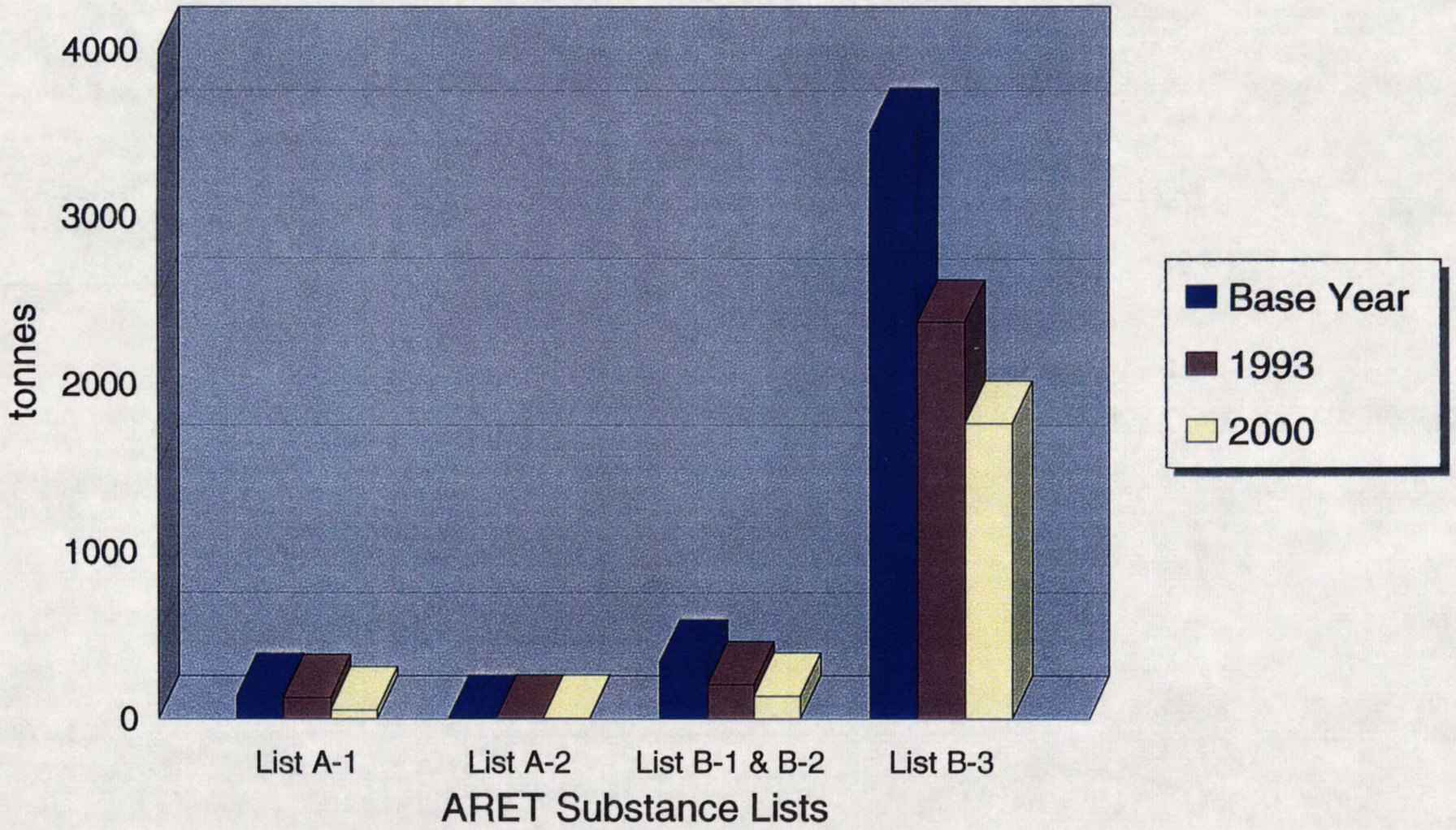
Source: Accelerated Reduction/Elimination of Toxics (ARET), "Environmental Leaders 1", Ottawa 1995.

Reductions & Projections in Emissions of ARET Substances by the Participants in the Pulp & Paper Sector



Source: Accelerated Reduction/Elimination of Toxics (ARET), "Environmental Leaders 1", Ottawa 1995.

Reductions & Projections in Emissions of ARET Substances by the Participants in the Steel Production Sector



Source: Accelerated Reduction/Elimination of Toxics (ARET), "Environmental Leaders 1", Ottawa 1995.

2.0 PURPOSE

The purpose of this study is to examine the role of ARET in influencing corporate behavioural change of participating Canadian businesses to engage in or improve their voluntary environmental action. More specifically, the focus here is to investigate in what ways, if any, ARET is affecting the participants' environmental performance and organizational dynamics pertaining to their toxic emissions reductions.

2.0 Goals and Objectives

The broad goal of this study was to determine the motivations, expectations, actions of ARET participants, and their opinions on the results of their involvement in the voluntary initiative. By collecting and analyzing data from ARET participants some insight can be provided towards the question: "Is ARET just a mechanism for reporting reductions in chemical releases that would be occurring anyway, or is ARET a mechanism for inducing behavioural change in the private sector?"

There were four objectives of this study:

A) To Scope out some of the reasons why firms decided to commit to the ARET challenge;

B) Determination of what participants expect to get out of ARET and how well is the initiative satisfying their expectations;

C) Identification of how ARET participants have met, or intend to meet, the targets of this voluntary program and analyzing if this is different than how they achieve regulatory compliance;

D) Ascertaining whether ARET is having unanticipated or unexpected changes on firms beyond just meeting the emission reduction target.

2.2 Methodology

The study was carried out through the following five tasks:

1) Development of a questionnaire that probes the issue of ARET's effect on corporate culture (i.e. looking at motivations to participate, actual environmental improvements, extraneous factors in emission reductions, etc.) and distribution of the questionnaire to all ARET participants (as well as the Stakeholder group for their files "FYI") as listed on the Secretariat's database;

2) Assessment of returned questionnaires for completeness and clarity and follow-up with companies that did not respond, to ensure adequate participation and sectoral coverage;

3) Compilation of survey results and selection of ten companies, based on predetermined criteria (e.g. industry sector, significance of changes induced, methods of reduction), to further investigate ARET's effect on the participating firms organizational dynamics that pertain to toxic emission reductions;

4) Conducted interviews based on questions developed to clarify the specific effect(s) ARET has had on the selected companies in terms of achieving or planning for toxic emissions reductions;

5) Analysis of both returned questionnaires and interview findings which is focussed on making an assessment of ARET's influence on participants' business practices in respect to their corporate environmental performance.

Tony Stone, Manager of ARET strategies, and Erin Windatt, a graduate student at Trent University were consulted periodically for discussion of issues relevant to this ARET study, (Windatt's thesis work is on the effectiveness of voluntary environmental initiatives in Canada).

3.0 SURVEY RESULTS

Appendix A lists the 17 survey questions used to gather preliminary data from the ARET participants. A total of 204 surveys were distributed to 148 ARET participants that were on the Secretariat's database as of December 1995. This included the distribution of questionnaires to individual facilities of firms with multiple locations, subsidiary companies, and/or several participating divisions/plants at different sites. The questionnaires were sent initially in the middle of January 1996 and collected until March 14th (although four surveys were received after this date and were included in this report's analysis).

There were 79 questionnaires returned which represented 98 facilities; i.e., some single survey responses integrated several facilities' data under the one survey (e.g. Dow was sent four questionnaires yet the one returned survey that was received from their head office represented all four facilities). The overall participation rate for the questionnaire was 48% (98 /204).

The following table displays the sectoral questionnaire response rate by industry sector (as categorized in *Environmental leaders 1*). Appendix B lists the survey respondents that participated in this study.

Table 3.1: Questionnaire response rate by industry sector.

Industry sector (ARET categories)	Number of surveys sent	Number of surveys returned	Number of facilities represented	Response rate (# sent/ # returned)
Aluminum	1	1	1	100%
Chemical Manufacturing	52	17	23	44% (23/52)
Chemical Specialities	10	3	3	30% (3/10)
Electrical Utilities	13	6	6	46% (6/13)
Government	6	2	2	33% (2/6)
Manufacturing: Other	20	4	4	20% (4/20)
Mining & Smelting	14	11	13	93% (13/14)
Oil, Gas & Petroleum	5	3	3	60% (3/5)
Pulp & Paper	61	16	27	44% (27/61)
Steel Production	22	16	16	73% (16/22)
Totals	**204**	**79**	**98**	**48% (98/204)**

Section 3.1 of this report analyzes the overall responses for each question and provides the percentage of responses for each question by all the survey participants.

3.1 Survey Question Analysis and Statistical Summary (all Sectors)

(Appendix C details the % of responses for the closed-ended questions by industry sector.)

1. What are your firm's annual sales?

≤ $2 million [**0%**]	$2 - $10 million [**1%**]
$10 - $100 million [**23%**]	$100 - $500 million [**33%**]
> $500 million [**38%**]	N/A [**5%**]

2. Number of employees at your firm?

≤ 50 [**0%**]	51 - 100 [**13%**]
101 - 500 [**23%**]	501 - 1000 [**16%**]
> 1000 [**46%**]	N/A [**3%**]

Question #1 & 2:
The majority of survey respondents were mid to large size firms. Most firms that returned the questionnaire (relative to the other size categories indicated) fell into the two highest categories of over $100 million in sales (71%) and over 500 employees (62%). This may reflect the need for ARET to reach smaller firms in each of the industry sectors. However, it may also be the case that many of the small to mid-size firms that were on the ARET database chose not to participate in this particular study.

3. Is your firm primarily domestic or export oriented?

Domestic [**31%**] Export [**44%**]
Domestic and Export [**20%**]

Question #3:
Of significance here is that ARET's standards are affecting products and materials that are being used by industrial markets both within Canada and internationally.

4. When did your firm officially commit to the ARET programme by preparing and submitting a toxic emissions reduction plan?

4(a). Please briefly summarize the main strategy of the plan in terms of how ARET reduction targets are intended to be met.

Question #4 & 4a:
Most respondents had initially committed to ARET in the 1994 Corporate Challenge (as detailed in *Environmental Leaders 1*). There were also several firms that were involved in the New Directions Group that preceded ARET as well as those who participated in the multi stakeholder committee that developed the ARET substance list and target parameters. Several of the 27 firms that submitted their initial action plans to the ARET Secretariat between March 1995 and December 1995 also responded to this study by completing the questionnaire. {See "ARET Update: Addendum to Environmental Leaders 1" December 1995}

The ARET Action Plans that were described and/or submitted vary so much that proper analysis of the technical details would go far beyond the terms of reference of this report. Some detail of the ARET Action Plans of the case study participants is discussed in the following sections. The diversity in approaches and strategies by participants aimed at reducing ARET substances is captured in the data collected and analysis of question #11.

5. Why did your firm get involved in ARET (i.e. what were the perceived benefits of participation)?

5(a). At this point in time, what is the potential for the realization of these benefits?

High [54%] Medium [38%] Low [6%] Not applicable [1%]

Question #5 & 5a:
There seemed to be two main reasons for participants to become involved in ARET. The first was a firms commitment to an Industry Association initiative (e.g., CCPA's Responsible Care program) or corporate environmental policy that was parallel to or compatible with ARET. The second key reason for joining ARET, as indicated by respondents, was that ARET's voluntary approach, which was based on "sound science" and "responsible targets" was largely welcomed by firms as an appropriate vehicle for developing feasible environmental protection strategies.

Some of the perceived benefits of joining ARET were: improved public image; improved government-industry relations, (especially in terms of regulation setting); process and product cost reduction; effective toxics management strategy

development; and improved emission reduction results. The vast majority of respondents indicated that the potential for the realization of their perceived benefits was attainable and likely to come to fruition ("High" + "Medium" = 92%).

6. At this point in time, do you feel there are any shortcomings of ARET?

Yes [**46%**] No [**51%**] Not applicable [**4%**]

6(a). If yes, please elaborate with a brief description and suggestion on how to improve on these shortcomings.

Questions #6 & 6a:
Almost half of the respondents felt that ARET had some shortcomings (46%). Many of these responses were in the form of suggestions on how to improve ARET, such as standardization of both release calculations and reporting amongst participants (another view of this problem is that the industry associations should be developing these types of standards). Several firms expressed a desire for an earlier base year than that specified in the *Environmental Leaders 1* report (1988). However, this would not be conducive to improving the reporting to accurately reflect what reductions have been achieved under the ARET corporate challenge. Other suggestions included technical issues such as the reassessment of ARET substances' persistence and bioaccumulative status, and consequently which of the five lists they should be on.

The issue of the lack of adequate methods to measure/estimate emissions was a commonly expressed point. Except for regulated substances, there are few, if any, protocols. Participants are using a variety of different benchmarks and yardsticks which will obviously affect the compilation and integration of reduction results. This issue does not just relate to ARET. It also applies to NPRI.[6] The fact that many firms now point this out in this arena would suggest that government and industry associations could develop accurate yardsticks via the ARET multi-stakeholder committee.

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[6] Some of the reporting differences between ARET participants and the figures that firms submitted to NPRI is discussed in the ARET Secretariat's report entitled "Comparison of 1993 ARET and NPRI Data" published in September 1995.

There were many instances where the suggestions for improvement provided such elaboration that they went beyond the focus of this study; however, those opinions that have not already been passed on to the ARET Secretariat will be communicated to Tony Stone.

7. **Prior to your commitment to the ARET initiative, did your firm have a branch, department or designated manager/director that dealt with pollution prevention?**

Yes [**90%**] No [**9%**] Not applicable [**1%**]

7(a). **If no, does your firm have one now as a result of organizational change aimed at meeting reduction targets developed under ARET?**

Yes [**4%**] No [**6%**] Not applicable [**88%**]

Question #7 & 7a:
The vast majority of survey respondents indicated that some type of pollution prevention department/branch/director existed prior to their involvement in ARET (90%). Out of the 9% that did not have this designation within their organization, 4% indicated that they now have one due to their involvement with ARET. Again this reflects the trend that most survey respondents had a well established environmental protection component within their firms prior to the birth of the ARET initiative. One of two conclusions could be made in regards to the firms without a pollution prevention component to their organization. Either these businesses are less likely to participate in ARET or are less likely to respond to this type of survey.

8. **Has your firm's participation in ARET helped identify opportunities to significantly reduce toxic emissions (i.e. relative quantity or hazard of release)?**

Yes [**47%**] No [**53%**]

8(a). **If yes, please explain.**

Question #8 & 8a:
Nearly half of the respondents indicated that ARET has helped them identify opportunities to significantly reduce toxics emissions. However, judging by the

nature of the verbal answers to question 8a, most in this group were assisted in fine tuning their firms' overall environmental protection strategies by developing specific strategies for a number of substances with target reductions via their ARET Action Plans. Environmental specialists at Novacor Chemicals, for example, expressed that ARET "helped highlight concerns and assisted in our ability to defend emission reduction strategies to senior management." In another case, however, a firm in the steel sector stated that opportunities for reduction were discovered by means of technology exchange with other participants. Out of the 53% of respondents that responded "no" to question 8, many firms indicated that since they did not emit significant amounts of ARET substances, the "opportunities to significantly reduce toxic emissions" did not exist.

9. Are there any other factors that may have encouraged your firm's toxic emissions reductions (e.g. legislation)?

Question #9:
Commitments to Industry Association initiatives such as NERM, corporate compliance programs, and internal environmental policies were some of the commonly mentioned "other" factors that have encouraged toxic emissions reductions within companies organizations. Occupational health and safety and expressed public concern were also indicated as motivating factors in reducing toxic emissions in addition to ARET. It is important to note here that ARET itself is not a means to an end. Participants seem to be choosing ARET as a vehicle to address factors such as employee and environmental health, but the reduction of toxic emissions is one approach - that is pollution prevention. Research and development, education and environmental enhancement and rehabilitation are also recognized methods to deal with environmental protection.

10. Through your firm's involvement with ARET, has your organization developed and implemented any new mechanisms to report toxic emission reductions?

Yes [**30%**] No [**66%**] Not applicable [**4%**]

10(a). If yes, please indicate the mechanism(s) used for this task:

Environmental policies	[**22%**]
Management systems (EMS)	[**15%**]
Public meetings	[**5%**]
New data collection systems	[**28%**]

Environmental performance reports	[41%]
Other	[6%]
Not applicable	[60%]

Question # 10 & 10a:
Two thirds of the survey respondents already had adequate reporting mechanisms in place to report their ARET progress (66%). Of the 30% of respondents that developed new reporting mechanisms for tracking toxic emission reductions under ARET, corporate environmental performance reports were the most popular form of communication (41%) due to their wide distribution. In addition to this, 28% of this latter group of respondents had developed new data collection systems to test and monitor for the presence of ARET substances in their operations. In light of these results, some firms seem to be taking a more active approach to communicating their commitment with ARET while others are choosing to give their involvement in the initiative a relatively low profile at this point in time.

11. If applicable, please indicate, by checking the list below, how your firm has achieved ARET reductions to date:

Substitution of substances	[58%]
Process/manufacturing equipment change	[65%]
Product stewardship	[24%]
Investment in pollution abatement technology	[50%]
Top-down corporate policies	[34%]
Bottom-up employee empowerment programs	[22%]
Product-line discontinuation	[20%]
Downsizing of facilities/production	[10%]
One other category specified	[15%]
Two other categories specified	[4%]
Not applicable	[5%]

Question #11:
The two most popular means of achieving reductions in ARET substances, as indicated in the questionnaire, were process/manufacturing equipment change (65%) and substitution of substances (58%). It is important to note that these methods for emission reductions are of the pollution prevention nature, in contrast to the pollution control element often associated with environmental regulation that focuses on end-of-pipe solutions and/or mitigation of the effects of toxic releases. In regards to the third most popular method of reducing/eliminating toxic emissions, investment in pollution abatement technology (50%) was a commonly described

strategy in the action plans. Although this latter method is generally considered of the pollution control nature, abatement approaches has often been responsible for substantial emission reductions to the level of nominal releases. Some of the methods listed in the "other" category included increased repair and maintenance (leak detection), introduction of treatment systems to neutralize and/or destroy toxins before they are released, increased chemical recoveries and efficiency in usage, and reformulation of process chemicals and end products.

12. **Apart from toxic emissions reductions, have your firm's actions on ARET substances led to any additional benefits such as improved efficiency or less industrial accidents?**
Yes [**37%**] No [**54%**] Not applicable [**9%**]

12(a). If yes, please elaborate.

Question #12 & 12a:
Over a third of respondents indicated that ARET has led to additional benefits other than toxic emission reductions (37%). Some of these other benefits were improvements in indoor air quality and employee safety, energy and process (and associated cost) efficiency, improved leak detection and repair programs, increased product yield from reduced material loss, and reduced chemical spills. This may be a good indication that ARET can contribute to enhanced competitiveness as well as improved corporate environmental performance.

13. **Has your firm communicated your organization's commitment to ARET to any of the following groups?**

Customers [**27%**]	Shareholders [**46%**]
Suppliers [**28%**]	Financiers (banks) [**28%**]
Other [**5%**]	Not applicable [**43%**]

Question #13:
The two most common responses that participating firms listed in regards to communication of their commitment to ARET were shareholders (46%) and "N/A" (no answer or not applicable) (43%). Further analysis of the high number of "N/A's" revealed that many respondents didn't necessarily separate ARET out from their reporting and communicating of their environmental performance to the listed parties. A few respondents indicated a fifth party to which they communicated their ARET involvement. One firm in the pulp and paper sector discusses ARET at their monthly Environmental Public Advisory meetings (Weldwood of Canada), and

several other firms in different sectors also indicated that they communicate their ARET commitment to the community and general public. Increased interaction with suppliers and customers are also important since it is with these groups that changes in materials and end products can be facilitated within a economic context.

14. Is your firm's involvement in ARET affecting the manner by which you conduct communications or transactions with the above groups?

Yes [**34%**] No [**61%**] Not applicable [**5%**]

14(a). If yes, please elaborate on how these interactions are changing.

Question #14 & 14a:
A significant portion of respondents (34%) indicated that their interactions with the groups identified in question 13 had been adjusted to factor in ARET issues. Some firms mentioned that there is a degree of increased public accountability of their toxic emission reduction commitments through ARET. In addition to this, due to increased and more accurate testing and monitoring of chemicals, firms were able to better communicate specifics about chemical releases in terms of how they occur as well as being able to share a detailed strategy on how they intend to reduce/eliminate them.

15. Do you find ARET to be working in a complementary manner with other reduction programs (i.e. industry association mandates, government programmes)?

Yes [**78%**] No [**19%**] Not applicable [**3%**]

Question #15:
Over three quarters (78%) of respondents felt ARET was a complementary toxic reduction mechanism that works with other instruments aimed at environmental protection such as regulations and industry association programs and corporate mandates. Many firms mentioned that their ARET Action Plans were easily integrated into their operations since they had the flexibility to make them compatible with their production and corporate framework.

16. Do you see ARET as an instrument for facilitating toxic emissions reductions or as a reporting mechanism?

Question #16:
There was a mix of responses to the question of whether ARET was an instrument for facilitating toxic emission reductions or a reporting mechanism, or both. There seems to be a correlation between the significance of a firm's releases or handling of ARET substances and its response to this question. There was tendency for firms who were already adequately dealing with ARET substances to indicate ARET as a reporting mechanism. Firms that were able to identify opportunities for further environmental performance improvements tended to indicate ARET as a facilitator of emission reductions.

17. If applicable, please explain how ARET is assisting your firm to comply with relevant legislation regarding toxic substance emissions.

Question #17:
The vast majority of firms indicated that ARET did not directly aid in compliance with relevant legislation. However, some firms expressed the opinion that ARET works in tandem with legislation by providing specific reduction targets by set dates for a multitude of substances, while providing autonomy within industry groups to devise reduction plans.

3.2 Preliminary Conclusions

Based on the returned questionnaires, some general conclusions can be made about the impact of ARET on the business practices of participants in this study. Many of the firms that chose to commit to the ARET initiative and that responded to this study's survey are fairly good corporate environmental citizens (i.e. internal environmental codes of practice, recognition awards for environmental stewardship) with improving track records in environmental performance, generally speaking. While this does reflect the business economic climate here in Canada (in regards to the role of environmental responsibility in market competitiveness and social acceptability), ARET seems to have captured the interest of the organizations that are striving to achieve a balance between being proactive in environmental action and progressive in their business.

If one looks at the impact of ARET in the context of the standard innovation S-curve, the data collected by the questionnaires paints a very positive picture for this

voluntary initiative.[7] While the S-curve analysis usually applies to how industry adopts new technology as a function of time, it can also apply to cultural change in business practices as well. After two years, the rate of adoption by industry is usually far smaller than the average of 68% participation overall from industry associations that was achieved under ARET.[8] Through this study, the questionnaire respondents indicated some impressive results in corporate behavioural change that maybe incremental but still substantial for ARET considering the relatively short period of time that has elapsed since the corporate challenge was issued.

The majority of Action Plans that were submitted to the ARET Secretariat do not contain token promises about toxic reductions. These strategic plans contain details on specific projects on what will be investigated, adjusted, replaced, and/or implemented in order to reduce ARET substances. Answers to questions 4 and 11 seem to provide some confirmation that voluntary initiatives can encourage pollution prevention as opposed to merely pollution control, with the latter being a common criticism of environmental legislation in Canada in the past. Nearly a third of survey respondents also initiated new data collection and reporting mechanisms to quantify toxic emissions of ARET substances and any progress in reductions (#10 & 10a).

Almost half the respondents found that through their commitment to ARET, they were able to identify opportunities to make significant reductions in their toxic releases (#8). One respondent said that upgrading and replacing equipment in one facility reduced mercury use by 80% and that this decision was directly attributable to their ARET commitment. In another instance, a pulp and paper firm said their significant reductions were achieved simply by conducting non-regulatory testing on previously unmonitored substances through ARET. In this example, the respondent pointed out that some substances were fairly easy to reduce once it was determined how, when, where and in what quantity they were emitted.

Approximately a third of respondents indicated that ARET is affecting communications and interactions with suppliers, shareholders, banks, customers as well as to the public community (#14). Responses to questions 10 & 14 seem to indicate that there is a degree of increased public reporting and accountability through ARET to a wide variety of stakeholders in regards to the firms actions on

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[7] Tirole, Jean, *The Theory of Industrial Organization*, MIT Press, Massachusetts, 1988, pg.402.

[8] "ARET Update: Addendum to Environmental Leaders 1" December 1995 pg.6.

environmental management systems. One response to 14a stated that the firms interactions with these groups were increasing and involved providing more information and openness.

Just under 40% of survey respondents expressed that through their firm's actions on ARET substances additional benefits such as improved efficiency and a reduction in industrial accidents have been realized (#12). Some firms expressed that the additional benefits that were experienced occurred largely due to the flexible nature of the response to the voluntarily targets. While many respondents expressed that regulation limits direction of corporate resources and restricts operational and administerial efficiency, ARET is perceived to be optimizing the results of their best efforts towards environmental protection and other corporate mandates.

On the whole, most study participants indicated that they perceived ARET as a complimentary emissions reductions mechanism that adds to their existing environmental protection efforts (#15). Again this reinforces the notion that ARET is a positive addition to the environmental protection regime that industry, NGOs and governments have formulated over the past several years here in Canada.[9]

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[9] Further investigation into the role of voluntary initiatives in environmental protection is being conducted by a Masters student, Erin Windatt, at Trent University. Windatts' thesis topic is "Options for Environmental Regulation: An Assessment of Selected Voluntary Programs for Industrial Environmental Protection." The thesis report is scheduled for completion in the autumn of 1997.

4.0 CASE STUDIES

This section provides some in-depth information about the effect that ARET is having on individual firms in terms of environment performance and corporate responsibility. These cases are based on the selected firms returned questionnaires, their ARET Action Plans (and any updates/progress reports), and the personal interviews. A summary analysis of these case studies and the survey analysis will be integrated in section 4.2. It should be noted that in the selection of firms for the case studies, the bias was to identify firms that seemed to be positively affected by their involvement in ARET and that their commitment to action for this initiative impacted their business practices and/or corporate behaviour. This was important to this study in order to investigate if, in fact, ARET is working in regards to facilitating toxic emissions reductions, and if so, how?

4.1 Selection of Case Studies

From the returned questionnaires, ten firms were selected for further investigation into ARET's impact on their organization. The following criteria were used in selecting candidates for the case study analysis:

a) representation of the 8 sectors of focus, i.e., private sector industries (excluding the Government and Electrical Utilities sectors due to nominal emission levels and largely public sector representation);

b) participation from before September 1995;

c) "yes" answers to at least three of the following survey questions #: 7a, 8, 12, 14 to show that ARET has actually had a noticeable affect on a firms operations or business practice;

d) detail and depth of answers to questions #: 5, 8a, 14a;

e) the number of selections from the list in question # 11 (especially from the first six on the list);

f) an answer to question # 16 that indicates if the firm perceives ARET as "facilitating emissions reduction";

g) willingness to participate (telephone confirmation).

The criteria points (c-f), listed above, were used to capture indications of ARET inducing corporate behavioural change that impacted both environmental performance and corporate culture. Analysis of the open-ended questions helped indicate which companies seemed to be taking full advantage of the voluntary approach of ARET by "greening" their business operations in a cost-effective and proactive manner. Factors considered in the above questions were: firm's reasons for participating in ARET; level of employee involvement and corporation-wide buy-in to internal ARET strategies; innovation and creativity in the ARET Action Plans; realization of additional benefits (e.g. improved efficiency); and degree of communication of emissions analysis and reduction/elimination strategies (i.e. to suppliers, shareholders etc.).

The following ten organizations were selected and interviewed for the case study component of this project:

- Shell Canada Ltd.(Oil, Gas, and Petroleum Products sector)
- Crestbrook Forest Industries (Pulp and Paper)
- Placer Dome Canada Ltd. (Mining and Smelting)
- Dow Chemical Canada Inc. (Chemical Manufacturing)
- AltaSteel (Steel Production)
- Alcan Ltd. (Aluminum)
- Crown Cork and Seal (Chemical Specialities)
- E.B. Eddy Forest Products (Pulp and Paper)
- Brunswick Mining and Smelting - Noranda (Mining and Smelting)
- IBM Canada (Manufacturing: Other)

The personal interviews were conducted over the period from February 22nd, 1996 to March 11th, 1996. Appendix D lists the guideline questions used in the interviews. Other questions asked were pertaining to specific information that was provided in the interviewees' returned questionnaires.

Case Study #1 - Shell Canada

As a key player in the Oil, Gas, and Petroleum industry, Shell has involved eighteen of its facilities across western and central Canada in the ARET initiative. Included in these sites are refineries, oil and gas facilities, lube and grease plants, a products finishing terminal and all downstream distribution and marketing sites. Although Shell is a large and complex petrochemical and petroleum company, it is a relatively small emitter of ARET substances on an industry scale. This is largely due to their involvement with other initiatives such as the CCPA's Responsible Care program and the Global Climate Change initiative as well as internal compliance programs devised to ensure adherence to relevant legislation

According to Sheldon Wamboldt, Shell's Sustainable Development Advisor in their Corporate Health Safety and Environment department, ARET plays a relatively minor role in the firms overall environmental protection strategy. However, Wamboldt points out that the Calgary based firm only chooses to participate in voluntary programs of value (i.e. cost-efficient and environmentally effective) and it was recognized that ARET dealt with substances of legitimate concern as well as helping them focus on specific chemicals. One of the appealing features of ARET to Shell is that it gives them autonomy by allowing them to devise their own plan to meet reduction/elimination targets. As such, ARET is more compatible with current internal schemes aimed at environmental protection as opposed to the introduction of new restrictive and inflexible command and control legislation.

"...we've been able to focus on three substances for a nominal amount of money relative to other mechanisms that are trying to achieve similar results."

The three main ARET substances that the company releases are PAH's, Benzene and Hydrogen Sulphide. Hydrogen Sulphide is not on the NPRI list, yet reductions of almost 70% have been achieved over the past few years, just shy of the 73% reduction target for the year 2000 as outlined in Shell's ARET action plan. From a cost-benefit analysis perspective, Benzene has been reduced effectively through hydrocarbon recovery schemes by 50% of 1988 levels, already meeting their ARET target for the Year 2000. However, this is still below the 69% national average for reduction commitment for this substance amongst ARET participants. It should be noted that Benzene is a substance that is "double-dipped" in the sense that other reductions programs also target this particular substance. "However", Wamboldt comments, "we've been able to focus on three substances for a nominal amount of money (while

making substantial reductions in emissions) relative to other mechanisms that are trying to achieve similar results."

In some instances, where two voluntary programs are working together towards the same objectives, dual benefits can result. Such is the case with ARET and the Global Climate Change program which helped Shell reduce PAH emissions while improving energy efficiency simultaneously. As mentioned in their action plan, there are sometimes indirect benefits from reduction initiatives that have positive impacts on other substances other than those on the ARET list. Product Stewardship is another internal mechanism that ARET fits in with, via Life Cycle Assessment (LCA), demonstrating Shell's broader responsibility of products from raw material extraction to end-use and disposal.

Shell has also been increasing spending on such initiatives over the last few years. In 1995, environmental protection capital and operating expenditures increased 16.5% from 1994 levels to approximately $106 million. A substantial portion of this expense is spent on clean-up in which Shell hopes to use the ARET focus (i.e. their action plan) to help reduce leaks and spills, including those that occur with external carriers of Shell product (which is not required by law). If too many incidents occur during this transportation stage, Shell will investigate the causes and, if necessary, change carrier companies and/or transport medium.

To give an accurate and detailed account of corporate environmental performance, Shell has chosen their award winning *Progress Towards Sustainable Development* report as means for documenting and communication progress of all their environmental mechanisms combined. Wamboldt suggested that it may be beneficial to consolidate ARET with NPRI to help keep track of achievements under ARET specifically.

In regards to ARET working in tandem with legislation, Wamboldt remarks: "some rules are necessary, but legislation does not need to be as restrictive as in the US. Canada has a distinct competitive advantage over the US and achieves the same, if not better, environmental protection results. We definitely need regulations, but voluntary initiatives, such as ARET and Responsible Care, are achieving some of the same goals as regulations set out to accomplish, except the voluntary approach is usually quicker, cheaper and more practical."

Case Study #2 - Placer Dome

Within the mining sector, Placer Dome has involved seven of its mining operations across B.C., Ontario and Quebec in the ARET corporate challenge of 1994. The Vancouver based firm also assisted the Mining Association of Canada in promoting ARET throughout the industry sector which was coupled with a peer pressure element for other firms to participate within the association.

Keith Ferguson, Manager of Environmental Affairs, stated that although ARET was supplemental to the direction their company was already heading (re environmental protection mechanisms), the voluntary initiative helped them focus in more depth on their operations as opposed to concentrating on merely 'end of pipe' remedies commonly associated with regulatory compliance. Placer Dome has already met and exceeded their action plan targets of 50% reduction with respect to 1988 levels for the key ARET substance emissions found within their processes. Actual reduction achievements of arsenic, copper, zinc, lead and cyanide range from 73%-99%. Despite major expansions at three of their mine sites and the addition of one new mine, their goal is to maintain at least 50% reduction in emissions (using 1988 as a base year) up to the year 2000.

Most substances Placer Dome emits are regulated. However, according to Ferguson, ARET is making them go above and beyond legislation by improvements in operations, such as water-use efficiency in respect to chemical loadings in effluent treatment. The company is currently looking at new ways to recycle effluent to meet their reduction goals. Some of the non-regulated ARET substances were not being analyzed by Placer Dome prior to the company's participation with the voluntary initiative. Even though testing and data collection for these substances showed nominal or zero emissions; ARET was identified as directly responsible for the firm initiating investigation of these substances.

"...these are nominal costs for improvements in environmental control and we are focusing on substances that are important."

When asked if ARET is worth it from cost/benefit analysis perspective, Ferguson replied: "yes, these are nominal costs for improvements in environmental control and we are focusing on substances that are important." ARET is perceived as a mechanism to help identify reduction opportunities by getting the firm's site managers and mining managers to sit down and scope out a reduction strategy.

ARET is resulting in significant improvements to the company's communications, both externally and within the organization. Through Placer Dome's involvement in this initiative, they have developed and implemented new data collection systems and a corporate environmental performance report which focuses on the general progress of all environmental protection schemes within the company. Placer Dome also utilizes bottom-up employee empowerment programs in achieving reductions of toxic emissions. Every employee and contractor will be inducted in environmental training programs, education in site specific issues, reporting and handling of substances and will be encouraged to provide management with feedback on their operations. Ferguson points out that " everybody here has the responsibility for the company meeting our environmental protection goals (including ARET targets) even if it is just seeing and reporting."

Although ARET is not the only factor behind toxic emission reductions, it has helped Placer Dome enhance their environmental management framework resulting in indirect benefits such as improved environmental safety and reporting and organizational structure improvements as mentioned above. Placer Dome is reporting its progress on reducing ARET substances annually to the ARET secretariat including updates on mine expansions and new mining facilities.

Ferguson commented on how ARET is creating additional internal pressure to achieve results from individual sites in regards to emission reductions within the organization. "It is helping us pull the necessary information together and ask ourselves - where are we?" Ferguson remarks. The targets seem to have provided a clear goal to where Placer Dome wants to be in respect to reducing toxic emissions, so now the further questions they are asking themselves are 'how do we maintain that standards after goals are reached and; what specifically do we need to do to continually reach those goals?'

Case Study #3 - Crestbrook Forest Industries

One of the two organizations in the Pulp & Paper sector highlighted in this report is Crestbrook Industries based in Cranbrook B.C. which is one of the smaller kraft pulp mills in the province. It was determined in 1994 by the company's initial involvement in ARET that their Skookumchuk pulp mill was the only facility that released ARET substances.

Bruce Burns, a P. Eng. & Technical manager at Crestbrook, stated that ARET helped them deal with discharges and emissions that are not included in the routine monitoring that all mills do. During 1995 the firm conducted quarterly sampling to determine emissions data of ARET substances that they did not previously have data for. This process, costing approximately $10,000 raised Crestbrook's awareness to PAH's formaldehyde & cyanide detections, which were not documented prior to their involvement in ARET. In their 1995 action plan Crestbrook committed to reducing their discharge of formaldehyde (List B-3) by 50% of 1995 levels within the target year 2000 by improving the control of chemicals used in their bleaching process.

ARET reductions to date have been largely achieved by process/manufacturing equipment change and investment in pollution abatement technology. Modernization of equipment was a significant expense to the company. However, it was said to be pollution prevention driven with added organizational benefits such as cost control (including improved efficiency) & less environmental liability and waste production. Burns added that despite the high expenditure, senior management felt it was money well spent since significant reductions were being made that have already shown up in the 1995 *Environmental Leaders 1* report.

"ARET is a positive force in bringing non-regulated substances to the corporate pollution prevention discussion table."

In regards to internally communicating Crestbrook's reduction objectives, relevant employee groups went through specific environmental reporting & EMS training programs. The company also increased their external communication links with testing labs due to their more frequent sampling and analysis activities of a greater number of substances. Burns pointed out that the increased accuracy and thoroughness of data collection of toxic emissions becomes extremely useful in public meetings, since they have more information and control of what their operations are emitting as well as how much, when and where the discharges occur. Burns also commented on how he

perceives ARET as an appropriate tool to communicate government priorities to industry. "ARET is a positive force in bringing non-regulated substances to the corporate pollution prevention discussion table. Generally speaking, when it comes to mid to long-term reduction goals, industry will respond to the voluntary mechanisms for making commitments to sound-science & consensus based targets."

An added point towards efficiency is that Crestbrook identifies better economics with ARET by spending money on internally devised strategies & implementation plans rather than in bureaucratic tangle often associated with unclear, ambiguous & poorly organized legislative requirements. However, Burns acknowledges that where law is essential in relation to the effectiveness of voluntary initiatives, "ARET will not achieve zero tolerance due to the inherent non-penal nature of the voluntary program. However, the targets met do bring emissions below health threshold levels (Public & Ecosystemic). Only regulations can achieve virtual elimination; all-be-it at a poorer cost/benefit after the marginal value level has been achieved via non-regulatory mechanisms aimed at pollution prevention & environmental protection." He added that voluntary measures may bring 100% reduction where control is achieved by switching inputs or totally changing a process. If reduction is to be achieved through application of pollution control equipment, the cost of marginal improvement will eventually put a ceiling on how far voluntary measures can go. "In our experience, the ceiling will still allow for very significant reductions," concludes Burns.

Case Study #4 - Dow Chemical Canada

Dow Chemical is one of the largest companies in the Chemical Manufacturing sector that is participating in the ARET initiative. Dow's initial commitment to ARET originated at the conceptualization phase in 1990 as a participant of the Industry Task Group on Zero Discharge, whose results were presented to the New Directions group. The Sarnia based firm was a key player in spreading the ARET concept through the CCPA (which has a 97% participation rate in ARET) using synergistic peer pressure, Dow chose to be a driver rather than just a passenger in the ARET vehicle.

"...if a compound is identified on the ARET list it has a higher priority for abatement."

Dow's processes involve a number of ARET substances. Many of these are on target for 50% or 90% reduction of 1991 levels by the year 2000, based on the firm's ARET Action Plan. In some cases, such as for Epichlorohydrin, the chemical is targeted for elimination as a result of the discontinuation of specific manufacturing processes. Although several of the ARET substances that Dow emits are regulated, David Shortt, Manager of Environmental Quality at Dow, states that "if a compound is identified on the ARET list it has a higher priority for abatement." With some chemicals, the company manages to positively affect their yield via emission reductions as in the case of a B-2 ARET substance, ethylene oxide. However, Shortt points out, "sometimes the investment in abatement may not achieve cost recovery but is still carried out because the chemical is toxic."

It was acknowledged that ARET is supplemental to Dow's overall environmental protection strategy rather than at the focal point. However, according to Shortt, ARET is really penetrating into the centre of their operations by reaching the Environmental Coordinators at each of the operating plants. The company utilizes self-empowered working teams at the operating level to develop plant specific strategies aimed at reducing emissions. These teams consider reductions in ARET substances as building blocks of their plans while also factoring in other objectives such as safety, productivity, cost competitiveness and environmental obligations/concerns. "ARET is a complementary mechanism to a combination of positive systems aimed at reductions. These efforts can be driven by our employees, rather than corporate management" remarks Shortt. The company also uses modified data collection systems that enable them to monitor ARET substances specifically and analyze what abatement has been done.

When asked to comment on the Toxic Use Reduction (TUR) approach versus managing emission risks, Shortt pointed out that while there is inherent logic in avoiding the production of toxic substances, there are clear benefits to managing the risks associated with certain substances. Shortt adds, "chemical substitution and alternative technologies are practical options in TUR in some cases. In other instances managing toxic substances (i.e. minimizing the quantity of release and mitigating their impacts) is a better option in light of the benefits of the end-product."

The question was raised about the government's ability to achieve what the private sector is achieving in ARET. Dow sees ARET as a complementary tool that allows for cost-effective management of priority compounds that enhances Canadian industrial competitiveness. Yet voluntary programs such as ARET are recognized as only one mechanism for environmental improvement, to be used with MOU's, regulations, etc.. Shortt adds that the effectiveness of ARET within their organization can be measured by analyzing the reductions in ARET substances over the last few years and, moreover, how they were abated. The benefits of improved cost efficiency, employee safety and public image resulting from the creative solutions applied to ARET issues are not normally associated with legislative compliance. In addition to this, Shortt stated that the appeal of ARET's flexibility is in its compatibility with proactive pollution prevention measures that are already in place as opposed to the prescriptive 'command and control' approach. "There is a definite economic benefit (including cost avoidance and long-term liability) beyond the obvious improved environmental protection, that is inherent in providing the private sector with the flexibility in choice in method of reduction. If ARET was not available in the early 1990's, to achieve the same results on ARET substances in the same time period would of probably cost a lot more."

Case Study # 5 - Alcan

At the time of the publication ARET update document (Addendum to *Environmental Leaders 1*) in December 1995, Alcan was the only company listed in the Aluminum Industry Sector as an active participant in the initiative. However, this is a case where ARET had no significant effect on the Montreal based organization than providing another means of environmental performance reporting. At the same times, this initiative has confirmed that Alcan is on the right track.

Similar to other large firms participating in the ARET challenge, Alcan had already been actively reducing their toxic emissions for approximately a decade before ARET started. However, the main difference here is that ARET had no incremental effect on the level of environmental protection that Alcan was already administering. Most of their ARET emissions' target challenges were already met prior their "commitment " to ARET in 1994. However, the CMA, Quebec MA, and Quebec Aluminum Association, by consensus, encouraged members to participate in ARET.

Alcan has much criticism on how they feel ARET needs to be improved. Jean-Marie Sala, Director of Environmental Affairs for Alcan, expressed that through their role in environmental committees in the industry associations, their company would like to have more influence on the listings and participate with the evaluative committee in the future. For example, it is of their opinion that PAH's should be moved to the B-2 list due to its inaccurate status of bioaccumulative assigned by the substance evaluation committee that developed the five ARET lists. Alcan is the largest single emitter of PAH's in Canada (as reported to ARET) and perhaps even the western world.

In regards to reporting on toxic emissions reductions, Sala sees ARET as an opportunity to "inform a large and interested public that the voluntary approach is simpler and more effective than the regulatory approach." Sala adds; "The ARET program should enable us to avoid the further development, costly for all, of inefficient laws and regulations." Alcan has also tried to persuade the ARET Secretariat that the base year of 1988 is not historical enough by being to recent and after the fact of significant reduction activities during the early to mid eighties. They are looking for recognition of the emission achievements prior to the conceptualization of ARET in order for Alcan to "receive all the credit they deserve".

It was pointed out that while legislative standards, in some cases, are technically easier to work with, they have a limited utility essentially as guidelines. From senior managements perspective, the commitment to continuously reduce emissions voluntarily, regardless of which program it is achieved through, is conducive to more flexible decision making, and ultimately, more results oriented actions.

Case Study #6 - Crown Cork & Seal Canada

Crown Cork and Seal (CCS) is categorized in the Chemical Specialties Manufacturing Sector. The Concord, Ontario, based firm became involved in ARET via a challenge put forth by the CMA to all member companies. Six of CCS's eleven facilities across Manitoba, Ontario and Quebec are covered by their ARET Action Plan.

Jim Armstrong, Regional Manager of Environmental Health and Safety at CCS, tries to better ARET's challenge by aiming for 100% elimination of all their ARET substances. "By achieving virtual elimination, we won't have to engage in any debate over the significance of these emissions," says Armstrong. CCS has also achieved some cost benefits through their ARET reduction activities. The metal fabrication company has realized some dollar savings by using solvent substitutes. One of the plants is also aiming to reduce the quantity used of the new substitution. In addition to this, by reviewing a specific manufacturing process, CCS upgraded parts washing equipment and subsequently reduced the labour time needed for the cleaning process. In the instance where cost increases associated with reduction activities occur and cannot be passed on to customers, Armstrong stated that the company understands that it may spend more in the early years of dealing with ARET substances yet with the one-time nature of these reductions expenditures, the benefits are realized annually over the long-term.

The three main ARET substances that CCS emits are MIBK, Lead and 1,1,1, Trichlorethane. The firm is aggressively tackling the issue of how to eliminate MIBK from their operations whilst still delivering the products that require this substance in its production. Armstrong has written letters to various suppliers requesting substitutes for the chemical and eventually found a company that was prepared to do some testing and experiment in reformulating a substitute for the toxic chemical currently used. Armstrong has also assembled an internal team of two research workers, two plant supervisors, one specifications employee and himself to develop strategies to reduce ARET substances, specifically MIBK. Some solutions include simple changes such as using an MEK free ink which is improves health and safety. Other more broader focuses of the team include analyzing the opportunities of recycling wash solvents.

Armstrong has written several articles in the company newsletter regarding ARET to help communicate CCS's commitment to toxic reductions and how they can potentially contribute to achieving their goals associated with CCS's participation with ARET. However, the employee empowerment used in the team approach discussed above, seems to be the most effective way of communicating ARET commitments internally. "It makes sense to involve the process staff in these reduction decision-making efforts because they know the logistics of the final strategy being implemented as well as comprehending the nature of the challenge," says Armstrong.

"It makes sense to involve the process staff in these reduction decision-making efforts because they know the logistics of the final strategy being implemented as well as comprehending the nature of the challenge," says Armstrong.

The company has recognized the advantage of getting to reduction targets ahead of the rest of industry by taking the role of environmental leaders. Some of these benefits include proactively dealing with legislative change and improving public image. It was suggested that since the public has access to all ARET participants' Action Plans as well as annual reports of the Secretariat, citizens concerned with the issue of toxic emissions in Canada can develop a better understanding of the nature of emissions in respect to how they are released and managed, and moreover, what specifically is being done to reduce the mass release of these toxic chemicals.

Case Study # 7 - Alta Steel

Alta Steel is part of the cross-sectoral Strathcona Industrial Association in Alberta, which meets monthly to discuss environmental issues and share solutions between industries. However, the main influence to join ARET came from Stelco, which Alta Steel is a subsidiary of, along with sister company, Stelco McMaster Ltee in Quebec. "There is a strong umbilical cord from corporate environmental officers to our company, and they have very high environmental standards," says Alvin Bortnick, Engineering Manager at Alta Steel.

Although the invitation to participate in ARET was suggested by Stelco in terms of acceptance and buy-in of senior management, Alta Steel also involves itself in important lateral interactions regarding toxic reduction strategies. Bortnick says their company often initiates communications with Environmental Managers of other Steel companies on a one-on-one basis, both in the U.S. and Canada, to discuss environmental protection measures including those devised under their commitment to ARET.

Bortnick has created and participates in an ARET committee comprised of maintenance, a general foremen, and a representative from both the manufacturing services department and quality control department. "The foremen are involved in this effort because they are the individuals that are closely tied to the operations and will have to enact any changes, and are able to do this with the maintenance team because of their collective understanding of handling these substances," he explains. The group reports monthly to the company's president since he strongly supports and endorses the ARET initiative. ARET activities are communicated to employees by the monthly business meetings bulletin. Workers also have the opportunity to ask questions and provide feedback on environmental programs at the monthly meetings. "There is a higher level of awareness through our ARET actions which should impact positively on employee health," suggests Bortnick. However, in another aspect, "ARET is a program that relatively few Canadians know about outside the workplace" which Bortnick hopes can be improved through growth in industry participation rates and with wider distribution of the ARET secretariat reports.

"There is a higher level of awareness through our ARET actions which should impact positively on employee health," suggests Bortnick.

The collection of data and development of reduction strategies for methylene chloride, phenols, MIBK, and ethanol (and in some cases mercury) are directly attributable to Alta Steel's commitment to ARET. The company uses ARET to focus on toxic substances to manage, where possible, use of listed chemicals as well as releases. The Edmonton based firm has increased their interactions with suppliers and testing laboratories in search of feasible substitutes for products containing methyl chloride and MIBK. Although environmental expenditures are considered non-discretionary to Alta Steel in terms of willingness to make the wholesale changes, substituting phenols, for example, presents a challenge in terms of cost/benefit analysis decision making. Given their commitment to reducing their ARET emissions, they are working to make this shift as cost-effective as possible. Testing for releases of this substance is planned in order to provide more detail on the dynamics of these emissions within their operations.

Bortnick believes that governments cannot achieve effective toxics management by regulations alone. "ARET allows the private sector to work with the cradle to grave assessment approach in managing toxic substances." Bortnick adds, "through ARET, the science and health community can identify and prioritize these substances that should be scheduled for reduction and elimination; and then industry has the opportunity to demonstrate its commitment and ability to achieve these targets." He explained that in some cases reductions are a matter of stopping the purchase or use of these substances. However, what the process of developing and implementing an ARET action plan provides is a better understanding of what products are purchased in terms of environmental effects, raised responsibility and awareness of suppliers and operational staff regarding the benefits of reducing the use of toxic substances, and continuing the search for better products (for both raw materials and manufacturing endpoints).

Bortnick states that Alta Steel can measure ARET's effectiveness in terms of what reductions have been achieved each year and by analyzing any positive (or negative) actions coming out of it. He added that their involvement in ARET has two other benefits that should be included in their evaluative criteria: regulatory compliance and employee health. An example is the recycling of EAF dust which allows more units to be used while at the same time reducing the volume of dust placed into storage. "Smaller storage facilities are easier to manage with respect to releases of fugitive dust and contaminated run-off waters. Recycling has extended the life of the existing facility. Benefits which cannot really be measured accrue when employees are exposed to less MIBK and methyl chloride in paints, solvents, adhesives etc. by implementing reduction/elimination strategies" states Bortnick. Alta Steel says that these reduction accomplishments are often gradual in the process of environmental improvement so that a long-term commitment through ARET is necessary for the continuous achievement of results.

Case Study # 8 - E.B. Eddy Forest Products

E.B. Eddy Forest Products Ltd., includes its pulp and paper mill in Espanola, Ontario, and its three paper operations in Ottawa-Hull and Vancouver in their ARET commitment. Although the Ottawa-based firm originally submitted their ARET action plan in 1994, their president, Ted Boswell was involved with the multi stakeholder committee within the New Directions Group from 1990.

E.B. Eddy mainly emits B-1, B-2 and B-3 substances, which ARET challenged firms to reduce by 50% of 1993 levels by the year 2000, and relatively small amounts of A-1 substances. The vast majority of B-1 and B-2 substances are planned to be reduced by approximately 85% by the year 2000. One of the methods the company intends to use in order to achieve these ambitious goals is their purchasing prohibition policy. Whenever a substance is proposed for use in the pulp mill, this list guides the decision makers to consider regulated bans or phase-out agreements of specific chemicals. In the 1994 Espanola ARET Action Plan, the plant manager committed to putting the ARET substances that they handle on this list. The Material Safety Data Sheets (MSDS) program will also be utilized to prevent entry of products containing ARET toxics into their facilities/processes . In addition to this, the action plan states that "each product in use, flagged as containing an ARET substance, will be seriously reviewed for potential removal." As an example of this, a product used to keep drill bits cool was found out to contain 48% of an ARET B-2 substance and was immediately banned and replaced with a substitute.

Jared Fein, Corporate Manager of Environmental Services for E.B. Eddy, explains how ARET is helping them improve their focus on reducing toxic emissions. "Some substances on the ARET list, especially volatile organic compounds, were not quantified, in respect to their actual releases, before we began participating in the ARET challenge. In our initial action plan, only the ARET chemicals that we had actual release data for were targeted. The next phase will be to conduct emission surveys to enable us to better monitor future ARET reductions." While E.B. Eddy intends to improve their data collection systems to fully analyze their standings with additional ARET releases, Fein added that testing and monitoring must prove to be accurate and cost-effective since important decisions may need to be made based on the results. Projects for reduction of ARET substances will be based on environmental priorities with consideration to technical and economic merit. The pulp and paper firm uses The Pulp and Paper Research Institute of Canada (PAPRICAN) for technical back-up and research which is supported by industry fees based on company sales.

Fein emphasized the importance of prioritizing reduction strategies. "We must consider where we should best direct funds and other resources when making reduction strategies which is answered by using ARET to determine which substances need to be dealt with first." The Espanola pulp mill is investing $16 million in equipment modernization and chemical replacements to eliminate the use of elemental chlorine, for example. Other methods that E.B. Eddy is using to achieve reductions include installing new air pollution abatement devices, developing alternative process designs and implementing secondary treatment systems. By reducing their use of chlorinated solvent disbursing agents, E.B. Eddy has also improved employee health and safety due to decreased exposure to the chemicals.

Fein expressed that he does not see the ARET initiative as a historical list involving one-time strategies. "It provides a structure by which industry can continuously present plans and goals set by the company." E.B. Eddy annually documents and reports their ARET progress to upper management and through their Sustainable Development report which is distributed widely to employees, customers, suppliers and the general public. Fein concluded, "if ARET continues to use the same science based approach from the technical committee and stakeholder involvement, E.B. Eddy will likely continue its commitment to ARET past the year 2000."

"[ARET] provides a structure by which industry can continuously present plans and goals set by the company."

Case Study # 9 - Brunswick Mining and Smelting

Brunswick Mining and Smelting Corporation Limited is the second participant within the mining sector to be highlighted. As a member of the Noranda Group, the New Brunswick firm has been involved with the New Directions Group and ARET since its inception. Brunswick assumed corporate leadership by encouraging other members of the Mining Association of Canada (MAC) and the New Brunswick Mining Association (NBMA) to participate.

ARET's direct impact has been minor because environmental management systems were already in place. The program complements Brunswick's corporate environmental strategies as the company strives for continual improvement in environmental management systems and performance. Leonard Surges, Director, Environment states, "ARET strengthens a release reduction culture." He adds: "the process increases public accountability and strengthens management focus on release reduction targets. ARET also strengthens the link between data collection and implementation of release reduction strategies. The focus on overall releases and reduction targets ensures that as major sources are addressed, less significant sources will be scrutinized. Together those sources can represent significant release reduction opportunities."

"The focus on overall releases and reduction targets ensures that as major sources are addressed, less significant sources will be scrutinized. Together those sources can represent significant release reduction opportunities."

Reduction targets may be achieved through various mechanisms, but the ARET challenge is taken seriously and Brunswick's acceptance of the challenge is taken seriously. Initial ARET targets were based largely on identifiable opportunities, as Brunswick is conscious of public and political expectations. Surges asserts, "Brunswick will achieve all targets ahead of schedule and is in the process of reviewing its commitments". He believes the company will commit to lower release targets in the near future.

Brunswick views ARET as a means to an end, and not as an end in itself. The company communicates overall environmental policies, strategies, objectives and plans to employees but does not focus internal or external communications on ARET. Surges emphasizes that a multi divisional operating company must set and reinforce relevant site targets with the active participation of divisional managers. Release

reduction opportunities vary between similar mines and are very different at the company's lead smelter and fertilizer plant. In any case, results can be achieved only with the commitment of site managers and employees. The company is conducting further environmental training for all employees that underscores personal commitment and responsibility. Surges explains, "All our employees operate processes or use materials that could result in harm to the environment under some circumstances. Each employee can play an important role in establishing and implementing procedures to minimize releases and risks to the environment." Conscientious workers assist the company to meet its ARET targets, but are motivated to reduce releases by accepting personal responsibility for the environment and not as a direct result of ARET.

Brunswick's internal policies and programs embrace the ARET approach of ongoing release reductions, but the firm believes voluntary initiatives such as ARET can play an important role in achieving environmental goals while reducing the competitive burden on industry. Surges said that their company believes that ARET is results-oriented and allows industry to use a risk-based approach to identify risk reduction opportunities and priorities without dictating the means by which targets must be achieved. It is also their perception that ARET is a flagship initiative that could play a key role in building public trust in industry credibility and trust in the willingness of industry to undertake other voluntary initiatives. Surges adds, "Canada's future environmental protection regime should provide more opportunities for input by industry and other stakeholders into the process of setting priorities and shared objectives, rather than debating the means by which objectives prescribed by governments are to be achieved. ARET can facilitate this paradigm shift by demonstrating industry's environmental maturity and willingness to act responsibly." The keys to success will be continued commitment by all ARET stakeholders and continuing growth in the number of organizations accepting the ARET challenge.

Case Study # 10 - IBM Canada

IBM Canada, categorized in the "Manufacturing: Other" sector in the ARET *Environmental Leaders* report, is a member of three industry associations who encouraged member companies to join the corporate challenge in 1994. The decision to participate was based on ARET's compatibility with IBM's long-standing corporate environmental policy. The company's Bromont facility in Quebec is the only Canadian location which handles ARET substances.

In relative terms, ARET is minuscule to the overall corporate environmental agenda. However, Richard Mireault, National Environmental Health & Safety Manager for IBM Canada, takes ARET seriously. "Our commitment to ARET involves public accountability which is an equivalent motivational factor as regulations to reducing emissions," adds Mireault. With this increased focus of public visibility in Canada (re environmental protection), IBM feels that their integrity as a proactive corporate citizen is embodied in their commitment to ARET.

The main ARET substance of issue to the Bromont facility is 1,1,2,2 - tetrachloroethylene (PERC), a B-2 substance which is also listed as a Priority Substance to be reduced under the *Canadian Environmental Protection Act*. Through IBM's ARET Action Plan, the company developed a multi-level reduction strategy which is focussed on evaluating alternative solvents for use, product technology migrations, and abatement equipment improvements. "A taskforce, devoted to PERC reductions/elimination under our ARET commitment, was created involving process owners/operators and environmental protection dedicated people," says Mireault. As a result of this initiative the firm has registered more rapid progress than expected, improved cost competitiveness of end products using the targeted substance and have developed a "no-clean" process technology. IBM has reduced PERCs by 65% of their 1993 emissions levels through their ARET strategy and is geared to revise their targets for the year 2000 via the task force mechanism.

"A taskforce, devoted to PERC reductions/elimination under our ARET commitment, was created involving process owners/operators and environmental protection dedicated people," says Mireault.

Mireault stated that the reduction activity is usually more of a challenge than the data collection and reporting aspect of ARET. However, the role of the latter is also

of significance here. Mireault increased monitoring frequency and shifted from annual reporting of PERCs usage to monthly reporting in order to track IBM's progress on reductions specifically for their ARET commitment. The firm's commitment to ARET is communicated to employees via a site specific environmental report. When relevant issues arise, such as major abatement equipment purchases or policy development, ARET is included in discussions on environmental protection strategies quarterly with Environmental Health and Safety managers and at monthly senior management meetings. While there is an open door policy for all employees to communicate with management, workers can also write a "speak-up" letter, which they have the option of signing, regarding any environmental concerns that they might have about IBM's operations and products. Mireault has been asked to make a presentation on voluntary initiatives regarding corporate environmental performance, including ARET, at an upcoming worldwide IBM Environmental Managers meeting in Washington.

IBM views ARET as an attractive tool for improving environmental protection in contrast to the administrative burden involved with many environmental regulations in Canada. Mireault stated that "voluntary initiatives such as ARET, allow for sufficient flexibility for businesses to develop their own plans for reductions aimed at results that are often more aggressive and are achieved more rapidly than legislative mandates." He added that by ARET streamlining the process of evaluating present conditions (i.e. via analyzing releases of lists of substances, and where, why, when and how they occur) and devising reduction strategies, prevention can have unlimited benefits that are not necessarily economically quantifiable.

4.2 Summary Analysis

Due to the fact that the study participation rate was less than 50%, any results and conclusions included in this report cannot be accurately said to represent the full population. However, according to ARET reports, many of the firms that did respond to the survey and/or participate in the case studies, were some of the larger firms that have higher volumes of chemicals handled in their operations relative to their industry sector. Therefore, while it cannot be statistically stated that the number of respondents was a representative sample, this study did capture a good proportion of firms that are significant 'players' within their respective industry sectors in terms of size and production parameters.

It was evident in both the surveys and interviews that the voluntary approach of ARET, as well as its risk based assessment element, was a welcome and very popular addition to the host of environmental protection mechanisms that were already in place (i.e. regulations, industry association MOUs, corporate environmental policies, etc.). It was clear that respondents were of the opinion that ARET contained the appropriate components to assist the private sector in meeting toxic emission reductions whether the substances were regulated or not. (Out of the 117 ARET substances, only 10% are regulated.) There is a key difference between the use of legislative tools and voluntary initiatives that was communicated by the study respondents. Regulations generally provide threshold limits or prescriptive equipment/operation standards whereas ARETs targets for a host of chemicals act as guidelines that allow individual firms to devise the most effective way to reduce/eliminate toxic substances. The surveys show that the majority of firms are choosing pollution prevention methods to achieve these reductions. Several firms have incorporated, or are in the process of investigating, the use of substitute chemicals which will enable them to achieve virtual elimination of some emissions.

Good corporate citizenship and commitments to a variety of environmental protection mechanisms seemed to be a major part of the impetus behind respondents participation in the ARET initiative. However it was evident that respondents are also interested in gaining greater public visibility in terms of their reduction efforts through their participation in ARET. The main role of industry associations, aside from participating in the multi stakeholder ARET advisory committee, was to communicate and encourage their member organizations to take part in this voluntary initiative. In terms of motivations, an underlying theme in many survey responses to question 5 was that firms recognized ARET as an opportunity to demonstrate to the public and regulators the type of improvements

that can be made voluntarily. In one case, a firm surpassed the 50% reduction of a B-list substance, as challenged by ARET, by setting a self-imposed 85% target.

While there were noted shortcomings of the ARET program, respondents generally provided suggestions for improvement that imply continued interest in participation. Many study participants communicated that their commitment to ARET does not necessarily end when their targets have been achieved. In the Brunswick Mining case, the fact that they will meet their ARET targets ahead of the year 2000, is not stopping for them to revise their reduction goals to reflect a more ambitious strategy. Other respondents also stated that they would consider increasing their reduction targets as well as considering new chemicals to reduce/eliminate if they were determined in the same process used for the development as the original lists. It was suggested by one study participant that an annual general assembly of ARET participants could help provide some brainstorming opportunities and cohesiveness across the industry sectors towards achieving current and future targets. In light of the comments on the "over reporting" burden that some respondents expressed, there seem to be some confusion amongst participants about the relationship between the inventory element of NPRI and the action oriented nature of ARET.

Although the ARET program itself does not identify opportunities for toxic reductions/elimination, there seem to be evidence that through the various corporate communications pertaining to ARET, that the voluntary initiative is facilitating discussions and strategy development that are conducive to achieving the goal of continuous environmental improvement. Nearly half the study respondents reported achieving significant emission reductions that were directly attributable to their ARET strategy. That translates into approximately fifty industrial facilities, across Canada that found feasible ways to make substantial improvements to their environmental protection mechanisms. This includes first-time testing of some toxic substances, new recycling schemes that extends the life of storage or processing facilities, ARET task forces or committees that are required to develop reduction plans and report to their president on a monthly basis about their strategic implementation.

It was apparent that differentiating between emission reductions achieved under ARET activities from those of other mechanisms (e.g. internal compliance programs) was often quite difficult. However, some firms were able to distinguish their reduction achievements and strategies from any other environmental management systems they have in place, as well as identify specific decisions relevant to toxic emissions that were directly attributable to their involvement in ARET. Crown Cork and Seal anticipate their ability to totally eliminate one of their ARET substances due to their phone calls and letters to chemical labs (suppliers)

asking for reformulated solvents. E.B. Eddy banned and replaced one of their process materials only after they discovered it contained an ARET B-2 substance.

Although the focus of ARET is on reducing emissions, it was quite clear that respondents were involving strategies that dealt with the prevention of pollutant releases in addition to pollution control activities. Many study participants provided examples of the additional benefits associated with toxic emissions reductions/elimination. This seems to support the notion that pollution prevention can pay off in more ways than one. Improved employee safety, better end products, and more efficient process operations were examples that study participants expressed. IBM for example, achieved their 65% reduction (from 1993 to 1995) of a B-2 substance through their newly developed ARET task force by improving one of their process technologies which also resulted in greater cost competitiveness for some of their end products. In another case, Placer Dome experienced greater water-use efficiency by improving their effluent treatment process in order to reduce emissions of an ARET substance.

Communication of firm's commitments to and achievements under ARET has been positively affected through participation in the initiative both internally through corporate channels and externally to other stakeholders (i.e. shareholders, public community, suppliers etc.). Several study participants said that through the development and implementation of their ARET strategies, environmental responsibility has been spread to all workers and has improved awareness of external parties as well with respect to how decisions about the handling of toxic substances are being made. Dow stated that their ARET commitment has penetrated into the core of their operations by reaching the environmental coordinators at each of the operating plants. It is quite positive to see that over 20% of study respondents are utilizing the innovation and creativity of their employees at all levels by initiating bottom-up employee empowerment programs to develop and implement their ARET strategies.

ARET Action Plans and reporting has also made these voluntary commitments more publicly accountable in regards to toxic reduction strategies and targets. As quoted in a recent study conducted by Queens University, one study interviewee stated that "under ARET, it is a senior CEO in industry who signs the report instead of an employee in charge of reporting to regulators."[10] To further this point, another participant in the Queens study said that "... if a CEO says something in a public document there is a lot more personal commitment than if somebody at the bottom

of the company pyramid sends a private note to a government regulator."[10] When considering the degree of increased communications about firms reduction strategies, ARETs visibility may improve substantially in the future. Details of Action Plans are being discussed monthly within operational staff task forces, quarterly at environmental health and safety meetings and annually amongst senior management and at shareholder meetings. In addition the ARET message is reaching the community through monthly public advisory meetings and, also the international scope through global corporate environmental managers meetings.

The case studies should be considered in the context of what ARET's element of flexibility allows for. Some firms enhanced purchasing policies to include prohibition of ARET substances while others redesigned process operations to reduce/eliminate the need for specific chemicals. The point here is that each firm will have their own subset of problems and opportunities associated with achieving toxic emission reductions. While there is this variance in methods that may be used to achieve these reductions, the result is the same across the board - a commitment to reduce ARET substances of issue to participating firms over the long term. Eight out of ten interviewees reported significant corporate behavioural change. One could ask if the remainder of the survey respondents were also interviewed, would the 80% rate of influence prevail?

5.0 CONCLUSIONS

It seems that earlier criticism of ARET by some ENGOs may have been premature and inaccurate. In the autumn of 1994, an article on zero discharge was published in an environmental journal that referred to ARET as a failure largely due to the withdrawal of ENGOs and labour groups from the stakeholder committee the previous September. The article also states that in regards to pollution prevention "...in terms of real progress there has been limited change in corporate behaviour."[11] This was said only six months after the ARET Corporate Challenge

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10 See in, "Lessons Learned from ARET: A Qualitative Survey of Perceptions of Stakeholders" Final Report April 1996, Environmental Policy Unit, School of Policy Studies Queens University.

11 Paul Muldoon and John Jackson, "Keeping the zero in zero discharge," *Alternatives*, vol.20(4), University of Waterloo, 1994, pgs. 14-20.

was launched. By looking at the data collected in both the ARET update document (Dec. 1995) and this study, it seems that given a reasonable span of time (18-24 months), ARET is somewhat of a success both in terms of achieving significant emission reductions and in influencing business practices towards greater environmental responsibility.

A significant portion of study respondents are doing something new and better and making a contribution to a better environment and more competitive company. Voluntary initiatives, such as ARET, may not be directly assisting companies with regulatory compliance, yet there is strong evidence that they can enhance a firm's overall environmental protection strategy. The cumulative effects of several small efforts, however humble and marginal, can have a very profound impact over time. The synergistic effect of commitments to ARET, in combination with other voluntary agreements as well as internal regulatory compliance programs, can translate into continuous improvements in corporate environmental performance, as can be seen in the eight industrial sectors that are highlighted in this report.

There seems to be evidence that ARET has had noteworthy effects on some firms in terms of influencing corporate behavioural change. Although this change in every case may not be significant on a large scale, yet, changes such as companies requesting substitutes and reformulations from suppliers, multi-level internal task forces created to focus on toxic emission reduction strategies and, major corporations discussing their involvement in ARET at international managers meetings are all an important part of the process of on-going environmental improvement in industrial practices. It may also be too early to accurately assess the effectiveness of ARET in quantitative terms on a wide sectoral scale. Since these are long term commitments, significant changes may be more noticeable in years to come when ARET Participants' Action Plans are fully implemented and more small to mid-size firms join the Corporate Challenge that ARET has put forth.

In terms of the long-term implications of the firms involved in ARET, the Conference Board of Canada stated that

> ". ..participants in voluntary programs are committing themselves to a particular philosophy of dealing with environmental issues, and they may be establishing expectations on the part of regulators and the public that they will continue to participate. It is important, therefore, that there is sufficient resolve on the part of management to sustain its involvement."[12]

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[12] Oikawa, Kathy, Hideo Kojima and Alec Tedder, "Voluntary Measures for Environmental Protection: How to Address Key Challenges," Conference Board of Canada, Report 149, Ottawa 1995.

Baring in mind the degree of increasing public accountability to ARET commitments, and the fact that there are significant additional benefits to participation in ARET, firms involved in this voluntary initiative are likely to continue their high interest and strategic action in this multi-stakeholder, cross sectoral program. A key factor in the longevity and continuity of ARET will also depend on continued support and commitments from Environment Canada and the Stakeholder committee that oversee and steer ARETs direction.[13]

In light of fiscal constraints across the public sector, there maybe some policy implications that may come out of the continuing evolution of successful non-regulatory mechanisms. While industry admits there are some chemicals that have been proven scientifically to present an unwarranted amount of risk and thus require strong regulation; they have also demonstrated through ARET that their voluntary efforts can achieve significant environmental protection results while reducing the regulatory strain on the government purse. "Where industry is doing a good job protecting its workforce and the general public from a toxic chemical, no public interest is served by further restricting industry's manufacture and use of the substance."[14] In its efforts to manage toxic chemicals, Canada's strategy should factor in what voluntary efforts are achieving, when formulating regulatory regimes in order to optimize the use of both public and private sector resources.

There is a strong message behind the fact that 92% of study participants got involved with ARET because they believe their commitment to their Action Plans will bring such results as improved emission reductions, process efficiencies, improved industry-government relations, and enhanced public image. Many firms are committing to this initiative because they see it as less adversarial and more cooperative than traditional regulatory mechanisms. In addition, most participants are realizing an optimization of resources towards their environmental protection efforts. The results that we are seeing through the implementation of ARET strategies are both quantitative in emission reductions and cost efficiencies as well as qualitative in corporate behavioural change in terms of how Canadian industry is communicating, planning, purchasing, testing and monitoring, manufacturing, and making decisions within their business operations.

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[13] An extensive study has been done on the role of these two groups in respect to the management of ARET. Please refer to footnote 10.

[14] Bast, Joseph L., Peter J. Hill and, Richard C. Rue, *Eco-Sanity: A Common-Sense Guide to Environmentalism*, Madison Books, Maryland 1994.

APPENDIX A

(English version of the Questionnaire)

David R. Roewade
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Waterloo, Ontario N2L 2X1
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Fax# (519)746-0292 (c/o U of W Faculty of Environmental Studies)

January 17th, 1996

(ARET participant address)

Dear *(contact name)* :

As part of a research project that I am conducting for Industry Canada, I have enclosed a questionnaire aimed at gathering preliminary information regarding your experiences with the Accelerated Reduction/Elimination of Toxics programme (ARET). The focus of this study is to determine what affect ARET is having on the way industry is doing business and to assess the relationship of changes in business practices to emissions reductions.

As you are probably aware, a variety of stakeholders have expressed skepticism in regards to the effectiveness of voluntary initiatives, such as ARET, in meeting "sustainable development" objectives (i.e. towards achieving Canada's economic and environmental goals). This questionnaire gives you the opportunity to express your organization's experiences with the ARET initiative. The numbers are in on the actual reductions in toxic emissions of ARET substances. However, we need your opinion to analyze if ARET is inducing desirable qualitative change in business operations (i.e. incorporating environmental protection goals while maintaining economic mandates).

I would appreciate if you would take 25 - 35 minutes to complete this survey and return it to me (address on letterhead) by February 5th, 1996. From the completed questionnaires, we will be selecting ten companies (one from each industrial sector identified in the ARET "Environmental Leaders 1" 1995 report) to further analyze the nature of ARET's impact on industry in Canada, via a personal interview and possibly a tour/review of facilities and operations.

Your participation in this study will help reveal some of the pros and cons of ARET. Thank you for your time and I look forward to your response.

Yours sincerely,

David R. Roewade

ARET PARTICIPANTS QUESTIONNAIRE

The following survey is aimed at collecting preliminary information regarding the changes that have been incorporated into individual organizations in order to meet the commitments made under the Accelerated Reduction/Elimination of Toxics (ARET) programme. It would be greatly appreciated, if the appropriate ARET representative for your organization would take the time to complete this questionnaire and return it to the project coordinator by February 5th, 1996 at the following address:

David Roewade - Project Coordinator
111 Churchill Street
Waterloo, Ont., N2L 2X1
Fax: (519)746-0292
(Fax - c/o University of Waterloo Faculty of Environmental Studies)

Please do not hesitate to contact David Roewade by phone (519)884-2004, or E-mail (drroewad@cousteau.uwaterloo.ca), with any questions regarding the survey or the context of this study.

Version française:
Le sondage est également disponible en français. Pour en obtenir une copie, veuillez communiquer avec M. David Roewade, coordinateur du sondage.

Firm Name: _____
Address: _____
Province/Postal Code: _____
Contact Name: _____
Telephone: _____

1. What are your firm's annual sales?
   [ ] ≤ $2 million [ ] $2 - $10 million [ ] $10 - $100 million
   [ ] $100 - $500 million [ ] > $500 million

2. Number of employees at your firm?
   [ ] ≤ 50 [ ] 51 - 100 [ ] 101-500 [ ] 501-1000 [ ] > 1000

3. Is your firm primarily domestic or export oriented? _____

ARET PARTICIPANTS QUESTIONNAIRE

4. When did your firm officially commit to the ARET programme by preparing and submitting a toxic emissions reduction plan? _____

4a. Please briefly summarize the main strategy of the plan in terms of how ARET reduction targets are intended to be met. (Attach extra sheets if necessary.)

_____

_____

_____

_____

5. Why did your firm get involved in ARET (i.e. what were the perceived benefits of participation)? _____

_____

_____

5a. At this point in time, what is the potential for the realization of these benefits?
High [ ] Medium [ ] Low [ ]

6. At this point in time, do you feel there are any shortcomings of ARET?
Yes [ ] No [ ]

6a. If yes, please elaborate with a brief description and suggestion on how to improve on these shortcomings. (Attach extra sheets if necessary.)

_____

_____

_____

7. Prior to your commitment to the ARET initiative, did your firm have a branch, department or designated manager/director that dealt with pollution prevention? Yes [ ] No [ ]

7a. If no, does your firm have one now as a result of organizational change aimed at meeting reduction targets developed under ARET?
Yes [ ] No [ ]

8. Has your firm's participation in ARET helped identify opportunities to significantly reduce toxic emissions (i.e. relative quantity or hazard of release)?
Yes [ ] No [ ]

8a. If yes, please explain. (Attach extra sheets if necessary.)

_____

_____

_____

ARET PARTICIPANTS QUESTIONNAIRE

9. Are there any other factors that may have encouraged your firm's toxic emissions reductions (e.g. legislation)?

_____

_____

_____

10. Through your firm's involvement with ARET, has your organization developed and implemented any new mechanisms to report toxic emission reductions?
Yes [ ] No [ ]

10a. If yes, please indicate the mechanism(s) used for this task:

Environmental policies	[ ]
Management systems (EMS)	[ ]
Public meetings	[ ]
New data collection systems	[ ]
Environmental performance reports	[ ]
Other _____	[ ]

11. If applicable, please indicate, by checking the list below, how your firm has achieved ARET reductions to date:

Substitution of substances	[ ]
Process/manufacturing equipment change	[ ]
Product stewardship	[ ]
Investment in pollution abatement technology	[ ]
Top-down corporate policies	[ ]
Bottom-up employee empowerment programs	[ ]
Product-line discontinuation	[ ]
Downsizing of facilities/production	[ ]
Other (specify) _____	[ ]
Other (specify) _____	[ ]

12. Apart from toxic emissions reductions, have your firm's actions on ARET substances led to any additional benefits such as improved efficiency or less industrial accidents? Yes [ ] No [ ]

12a. If yes, please elaborate.

_____

_____

_____

ARET PARTICIPANTS QUESTIONNAIRE

13. Has your firm communicated your organization's commitment to ARET to any of the following groups? If so, please briefly explain by what means:

Customers [ ] _____
Shareholders [ ] _____
Suppliers [ ] _____
Financiers (banks) [ ] _____

14 Is your firm's involvement in ARET affecting the manner by which you conduct communications or transactions with the above groups?

Yes [ ] No [ ]

14a. If yes, please elaborate on how these interactions are changing.

_____
_____
_____

15. Do you find ARET to be working in a complementary manner with other reduction programs (i.e. industry association mandates, government programmes)?

Yes [ ] No [ ]

16. Do you see ARET as an instrument for facilitating toxic emissions reductions or as a reporting mechanism? _____
_____

17. If applicable, please explain how ARET is assisting your firm to comply with relevant legislation regarding toxic substance emissions.

_____
_____
_____

Thank you for taking the time to complete this questionnaire. Please return this document to the Project Coordinator as indicated on the cover page of this survey.

Appendix B - Survey Respondents by Sector

Aluminum
Société d'Électrolyse et de Chimie Alcan, Limitée

Chemical Manufacturing
Bayer Rubber Inc.
Celanese Canada Inc. (Edmonton)
Celanese Canada Inc. (Kingston)
Chinook Group
Dow Chemical Canada Inc.
Eka Nobel Canada Inc.
FMC of Canada
Hercules Canada Inc.
HL Blachford Ltd.
Mousanto Canada Inc.
Nacan Products Ltd.
Novacor Chemicals Ltd.
Oxychem Dorez Canada
Petresa Canada Inc.
PPG Canada Inc.
Uniroyal Chemical Ltd.
Witco Canada Inc.

Chemical Specialities Manufacturing
Advanced Monobloc
Crown Corn and Seal Canada Inc.
Lever (A division of U L Canada Inc.)

Electrical Utilities
Alberta Power Ltd.
B.C. Hydro
Hydro Québec
Newfoundland and Labrador Hydro
Ontario Hydro
Saskatchewan Power (*Sask*Power)

Government
National Department of Defence
National Capital Commission

Manufacturing Other

Chrysler Canada
IBM Canada Ltée
Michelin North America (Canada) Inc.
Plastimo Ltd.

Mining and Smelting

Brunswick Mining and Smelting Corp Ltd.
Cambior Inc.
Cominco Ltd.
Echo Bay Mines Ltd.
Falconbridge Ltd.
Highland Valley Copper
Hudson Bay Mines
Inco Ltd.
Placer Dome Canada Ltd.
Syncrude Canada Ltd.
Westmin Resources Ltd.

Oil, Gas, and Petroleum

Imperial Oil Ltd.
Shell Canada Ltd.
Suncor-Sunoco Group

Pulp and Paper

Abitibi-Price Inc. (Stephenville Divison)
Avenor Inc.
Bowater Mersey
Canadian Forest Products Ltd.
Crestbrook Forest Industries Ltd.
Domtar Inc. (Lebel-sur-Quévillon Facility)
Domtar Inc. (All other facilities)
E.B. Eddy Forest Products Ltd.
Fletcher Challenge Canada (Campbell River)
Fletcher Challenge Canada (Crofton Pulp & Paper)
Irving Pulp & Paper, Ltd.
Repap Manitoba
Stone-Consolidated Corporation (Fort Frances)
Stone-Consolidated Corporation (Kenora)
Weldwood of Canada Ltd. (Hinton Division)
Weyerhaeuser Canada Ltd.

Steel Production

Algoma Steel Inc.
Alta Steel
Atlas Specialty Steels
CHT Steel Compant Inc.
Dofasco Inc.
Frost Wire Products Ltd.
Gerdau Courtice Steel Inc.
Slater Steels (H.S.B. Division)
Stelco Inc. (Lake Erie Works)
Stelco Fasteners Ltd.
Stelco McMaster Ltée
Stelfil Ltée
Stelpipe Ltd.
Stelwire Ltd. (Hamilton)
Stelwire Ltd. (Burlington)
Sydney Steel Corporation

APPENDIX C - Survey Results by Sector

		Response %										
Sector	**Ques**	**Res. 1**	**Res. 2**	**Res. 3**	**Res. 4**	**Res. 5**	**Res. 6**	**Res.7**	**Res. 8**	**Res. 9**	**Res. 10**	**Res. N/A**
Steel Production	**1**	0	6.25	31.25	43.75	18.75						
(16 surveys)	**2**	0	12.5	50	12.5	25						
	3	12.5	56.25	31.25								
	5(a)	68.75	31.25									
	6	31.25	62.5									6.25
	7	93.75	6.25									
	7(a)	0	6.25									93.75
	8	75	25									
	10	68.75	31.25									
	10(a)	50	12.5	12.5	50	43.75	18.75					31.25
	11	87.5	62.5	25	68.75	37.5	6.25	12.5	6.25	0	0	
	12	50	43.75									6.25
	13	18.75	80	50	43.75							18.75
	14	43.75	50									6.25
	15	93.75	6.25									
Oil, Gas, Petroleum	**1**	0	0	0	0	100						
(3 surveys)	**2**	0	0	0	66.66	0						33.33
	3	0	100	0								
	5(a)	100	0	0								
	6	66.66	33.33									
	7	100	0									
	7(a)	0	0									100
	8	66.66	33.33									
	10	100	0									
	10(a)	0	33.33	0	33.33	33.33	33.33					66.66
	11	33.33	66.66	66.66	0	0	0	0	33.33	66.66		33.33
	12	66.66	0									33.33
	13	0	100									
	14	100	0									
	15	0	0									100

Ques. - Questions Asked. For Ques. 3, (1 = Export, 2 = Domestic, 3 = Both) Questions 6, 7, 7(a), 8, 10, 12, 14, 15 (1 = Yes, 2 = No)

		Response %										
Mining and Smelting	**Ques**	Res. 1	Res. 2	Res. 3	Res. 4	Res. 5	Res. 6	Res.7	Res. 8	Res. 9	Res. 10	Res. N/A
(11 surveys)	**1**	0	0	18.18	36.36	45.45						
	2	0	0	9.09	9.09	81.81						
	3	0	72.72	27.27								
	5(a)	36.36	54.54	9.09								
	6	36.36	63.63									
	7	100	0									
	7(a)	9.09	0									90.9
	8	54.54	45.45									
	10	63.63	36.36									
	10(a)	36.36	27.27	18.18	63.63	54.54	9.09					27.27
	11	36.36	81.81	27.27	63.63	72.72	45.45	9.09	9.09	18.18	9.09	
	12	45.45	54.54									
	13	27.27	72.72	18.18	36.36	27.27						
	14	9.09	72.72									18.18
	15	81.81										18.18
Pulp and Paper	**1**	0	0	6.25	43.75	43.75						6.25
(16 surveys)	**2**	0	0	18.75	31.25	72.72						
	3	81.25	6.25	6.25								6.25
	5(a)	18.75	56.25	18.75								6.25
	6	50	43.75									6.25
	7	75	25									
	7(a)	6.25	18.75									75
	8	25	75									
	10	18.75	62.5									18.75
	10(a)	12.5	12.5	0	12.5	12.5	0					68.75
	11	56.25	68.75	6.25	62.5	18.75	18.75	18.75				12.5
	12	31.25	62.5									6.25
	13	18.75	25	12.5	25	6.25						62.5
	14	6.25	93.75									
	15	50	50									

Ques. - Questions Asked. For Ques. 3, (1 = Export, 2 = Domestic, 3 = Both) Questions 6, 7, 7(a), 8, 10, 12, 14, 15 (1 = Yes, 2 = No)

		Response %										
	Ques	Res. 1	Res. 2	Res. 3	Res. 4	Res. 5	Res. 6	Res.7	Res. 8	Res. 9	Res. 10	Res. N/A
Chemical Manufacturing	**1**	0	0	47.06	35.29	11.76						5.88
(17 surveys)	**2**	0	41.18	29.41	5.88	23.53						
	3	47.06	23.53	29.41								
	5(a)	76.47	23.53									
	6	29.41	64.7									5.88
	7	94.12	0									5.88
	7(a)	0	5.88									94.12
	8	41.18	62.5									
	10	5.88	94.12									
	10(a)	5.88	0	0	5.88	5.88						94.12
	11	35.29	58.82	17.65	52.94	35.29	23.53	35.29	11.76	29.41	5.88	
	12	35.29	64.71									
	13	29.41	29.41	17.65	17.65	17.65						47.06
	14	94.12	5.88									
	15	88.24	11.76									
Manufacturing Other	**1**	0	0	25	0	75						
(4 surveys)	**2**	0	25	0	0	75						
	3	50	0	50								
	5(a)	75	0	25								
	6	0	25									
	7	100	0									
	7(a)	0	0									100
	8	50	50									
	10	0	100									
	10(a)	0	0	0	0	0	0					100
	11	100	50	50	25	25	25	25	0	25	0	
	12	25	50									25
	13	25	25	25	25							75
	14	0	100									
	15	50	50									

Ques. - Questions Asked. For Ques. 3, (1 = Export, 2 = Domestic, 3 = Both) Questions 6, 7, 7(a), 8, 10, 12, 14, 15 (1 = Yes, 2 = No)

		Response %										
	Ques	Res. 1	Res. 2	Res. 3	Res. 4	Res. 5	Res. 6	Res.7	Res. 8	Res. 9	Res. 10	Res. N/A
Chemical Specialities	**1**	0	0	33.33	33.33	33.33						
Manufacturing	**2**	0	0	66.66	33.33							
(3 surveys)	**3**	33.33	66.66									
	5(a)	66.66	33.33									
	6	66.66	33.33									
	7	66.66	33.33									
	7(a)	0	0									100
	8	33.33	66.66									
	10	0	100									
	10(a)	0	0	0	33.33	0	0					66.66
	11	66.66	100	0	0	33.33	33.33					
	12	33.33	66.66									
	13	66.66	33.33	66.66								33.33
	14	0	100									
	15	100	0									
Aluminum	**1**	0	0	0	0	100						
(1 survey)	**2**	0	0	0	0	100						
	3	100	0	0								
	5(a)	100	0	0								
	6	100	0									
	7	100	0									
	7(a)	0	0									100
	8	0	100									
	10	0	100									
	10(a)	0	0	0	0	0	0					100
	11	100	100	0	0	0	100	0	0	0	0	
	12	100	0									
	13	0	0	0	0							100
	14	0	100									
	15	0	100									

Ques. - Questions Asked. For Ques. 3, (1 = Export, 2 = Domestic, 3 = Both) Questions 6, 7, 7(a), 8, 10, 12, 14, 15 (1 = Yes, 2 = No)

		Response %										
	Ques	Res. 1	Res. 2	Res. 3	Res. 4	Res. 5	Res. 6	Res.7	Res. 8	Res. 9	Res. 10	Res. N/A
Electrical Utilities	**1**	0	0	0	16.67	83.33						
(6 surveys)	**2**	0	0	0	16.67	83.33						
	3	100	0	0								
	5(a)	16.67	83.33	0								
	6	83.33	16.67									
	7	100	0									
	7(a)	0	0									100
	8	33.33	66.67									
	10	33.33	66.67									
	10(a)	33.33	50	0	33.33	16.67						50
	11	50	33.33	50	16.67	16.67	16.67	50	16.67	33.33	16.67	16.67
	12	0	66.66									33.33
	13	33.33	33.33	50	33.33							50
	14	33.33	66.66									
	15	100										
Government	**1**	0	0	0	0	0						100
(2 surveys)	**2**	0	0	0	50	0						50
	3	0	0	0								100
	5(a)	100	0									
	6	50	50									
	7	50	50									
	7(a)	50	0									50
	8	50	50									
	10	0	100									
	10(a)	0	0	0	0	0	0					100
	11	100	50	50	50	50	0	0	50	0	0	
	12	0	50									50
	13	0	0	0	0							100
	14	0	50									50
	15	100	0									

Ques. - Questions Asked. For Ques. 3, (1 = Export, 2 = Domestic, 3 = Both) Questions 6, 7, 7(a), 8, 10, 12, 14, 15 (1 = Yes, 2 = No)

APPENDIX D
Guideline Interview Questions

1) To what extent does your involvement with industry associations act as a peer pressure influence to participate in voluntary environmental protection programs such as ARET?

2) Is ARET raising the level of market entry or affecting competition with other firms in the same industry sector as your firm?

3) Has your firm's participation in the ARET initiative modified or required adjustments to corporate behaviour re environmental protection (i.e. toxic emissions)?

4) Are there any of the ARET substances that your firm was not monitoring/testing/managing prior to your participation in ARET that your firm is actually currently emitting?

5) Has your firm's activities, relevant to reducing ARET substances, impaired or improved your profitability ?

6) From a cost/benefit analysis perspective is ARET worth it?

7) How does your firm communicate your commitment to ARET targets to your employees (is it one way, does it involve feedback loops)?

8) Has ARET got your firm communicating with any parties that you were not yet interacting with prior to your involvement with ARET? {ref: survey questions #13 & 14}

9) Do you think ARET is more appropriate in terms of facilitating toxic emissions reductions than economic instruments such as pollution taxes?

10) Is ARET complementing or replacing the suite of tools to lower toxic emissions (e.g. regulations, economic incentives, taxes, etc.)?

11) Without ARET, would the portion of <u>non-regulated</u> ARET substances (approx. 90 before PSL 2) be dealt with by your firm (to what extent)?

12) Of the 17 regulated ARET (or of 49 NPRI common substances) which has been more effective in helping to actually <u>facilitate</u> emission reductions for your firm legislative hurdles or ARET targets?

13) Can your firm differentiate between which emission reductions are directly attributable to ARET from those reductions that are achieved under other mechanisms (i.e. internal compliance programs, industry association initiatives, other cross sectoral agreements)?

14) How can you assess the effectiveness of ARET in your firm (what evaluative criteria can your decision makers use to measure its success or failure)?

15) In light of on-going deregulation of environmental protection legislation in Canada (see student lobbying letter); do you see ARET as an effective mechanism towards continual environmental improvement (credibility, accountability etc.)?

16) If the federal and/or provincial government increased "command & control" type legislation (such as US regulatory regime); would ARET be necessary?

17) From your firms point of view, is ARET's focus on toxic release more effective in meeting both corporate financial objectives and environmental protection goals (i.e. sustainable development type formula) than a toxic use reduction focus? Why?

18) In regards to regulations and ARET, which is more challenging/burdensome - monitoring and reporting or reduction activities?

19) After your firms reduction/elimination targets are met for the current list of ARET substances, then what? What happens after the year 2000?

Note: Questions #15,16,17 were combined into one question during the latter four interviews. Other variations in these questions was dependent on the rythym of the interview, (i.e. types of responses that were given by the participant) and, where references were made to the firms completed surveys and/or ARET action plans.

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TD 897.8 .C2 R6 1996
Roewade, David R
Voluntary environmental action a
participant's view of ARET

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