

Greening Productivity:

Adjusting to
Environmental
Change

*Final Report of the
Task Force on Adjusting
to Environmental Change*

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Canadian Labour Market
and Productivity Centre

Greening Productivity: Adjusting to Environmental Change

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The Canadian Labour Market and Productivity Centre (CLMPC) is an independent national labour-business organization whose mission is to contribute to economic growth and the betterment of society by improving business-labour relations in Canada and by providing joint advice on public policy, particularly related to labour market and productivity issues.

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EXECUTIVE SUMMARY

This report examines the lessons from and makes recommendations on the activities by business and labour in addressing environmental pressures at the workplace and sector levels. The report is a synthesis of case studies done by the CLMPC in three sectors: forestry and forest products; mining; and chemicals. These sectors were identified as facing significant environmental responsibilities. The detailed description of the case studies is available in a background document *Case Studies in Adjustment to Environmental Change*.

The report has been prepared by the CLMPC for Human Resources Development Canada. The work has been supervised and guided by a joint business-labour Steering Committee and represents their joint perspective on a range of issues that are likely to assume increasing importance in the future, particularly in how human resource policies are affected.

There is very little research that has been done on responses by business and labour at the workplace and sector levels to environmental pressures. The methodology developed in this project has been to use case studies as the principal data source (a list of the cases is contained in Table 1 of the report). This is supplemented by sector profiles, the environmental pressures they face, as well as examples of international practice and models of adjustment to environmental concerns.

The environment has become a permanent and underlying concern with greater international focus. Increasingly customers are making environmental demands, and sources of capital pay close attention to companies' environmental risks. Government approaches to the environment are emphasizing framework legislation and pollution prevention together with a growing number of non-legislated agreements between industries and governments. All these discernible shifts will affect the future activity of both business and labour.

These shifts have made environmental issues increasingly important for both business and labour, particularly in terms of the long term survival and growth of the company and the security of employment.

Increasingly companies have come to realize that, while environmental regulatory compliance is still a significant concern, the environment is an important part of their competitive armoury; and that failure to address these issues can result in lost customers. Furthermore, better environmental performance can also reduce costs, for example, through reduced energy use. Liability of directors and officers of a company for environmental situations has also served to underline the importance of environmental performance.

For labour, ensuring the long term security of employment will depend on the survival of the company and improved environmental performance. In the immediate term the adjustments designed to achieve sustainable production and employment can both displace workers and create job opportunities in related areas. The challenge is to facilitate the transition of displaced workers into new job opportunities. Improving the working environment and protecting the health of workers is also a key concern of

unions. Finally, workers have special knowledge of work operations which is useful in developing better environmental practices in the workplace.

For these reasons both business and labour are attempting to integrate environmental values into business planning and collective agreements. Such activities include environmental auditing, public annual environmental reports, product stewardship initiatives, development of environmental management standards, the use of environmental committees, education of workers, linking environmental performance and productivity, and identification of potential “green” jobs. It is likely that pressure for further integration of environmental concerns into the long term activities of labour and business will continue.

A central message of the case studies is that joint business-labour approaches and full information can be successful in developing innovative ways of greening productivity of workers and companies.

The sector cases focus on three multi-stakeholder approaches as well as examples from others. The cases show how such approaches can provide the necessary long term focus on planning and environmental issues. This includes the development of a sustainable resource base in both the mining and forestry examples. A multi-stakeholder process for a sector permits a full discussion between the affected parties so that economic, social and environmental values can be integrated.

Government tended to be a facilitator and supporter of the multi-stakeholder process rather than directing it, which meant innovative adjustment responses and plans can be developed that are tailored to suit the specific needs of a sector. For human resources adjustment, training was recognized as a critical component of any responses to environmental pressures. But probably the most startling aspect of these processes is that they have occurred at all, particularly in resource sectors, since consensus approaches are a break from more traditional and adversarial approaches.

The results from the workplace cases show a rich variety of responses. They share a common element, however, in that they all involved activity by both business and labour, which was a critical element for selection of case studies. While some cases highlight the importance of new technologies, several point to changing work practices in order to improve environmental performance. Joint processes between business and labour were able to devise cost effective ways that were simple to implement and beneficial to the environment.

Like the multi-stakeholder processes, the workplace cases also indicated very clearly the importance of training, particularly awareness training, in adjusting to better environmental practices and technologies. In workplaces where job displacement occurred, different innovative solutions to reduce the burden on displaced workers were jointly formulated. In essence what these innovative adjustment solutions achieved was a means of sharing with affected workers some of the productivity gains from change, even in cases where firms faced intense cost pressures.

Another strategy adopted in some cases was a reinvention of product lines and production processes in order to improve environmental performance and reduce the risk of heavy

costs from environmental factors. Finally, many cases demonstrated the importance of good community relations in an environmental strategy. Provision of full information and discussion with the surrounding community built trust and allowed for proper public input on actions by companies that could impact on the local environment.

Recommendations

Recommendation #1

We recommend that business and labour enhance existing processes to address environmental issues and impacts and devise effective solutions to environmental concerns. Sufficient information should be made available to the joint process for this purpose. The issues to be addressed include:

- i) the environmental risks and impacts of handling certain substances in the workplace;***
- ii) the environmental risks and consequences of certain workplace practices;***
- iii) more environmentally benign workplace practices that can be accomplished without large capital investments; and***
- iv) limitations on the exposure of workers to toxic substances over their working life.***

Recommendation #2

We recommend that the information placed before the joint business labour process should be as much as possible based upon sound scientific data. The joint process will attempt to minimize the risk of industrial activity given the best ability to do so through the proper use of the precautionary principle: where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation.

Recommendation #3

We recommend that, in addressing significant and discontinuous change that includes but also extends beyond environmental concerns, business and labour should extend joint workplace processes. The purpose would be to assess fully the implications of change and devise solutions that would remove the fear and uncertainty of change. Such discussions would respect the confidentiality and proprietary concerns of companies vis-à-vis their competitors and could include the following areas:

- i) significant changes in production technology;***
- ii) training needs and required skills; and***
- iii) job implications of changes.***

Recommendation #4

We recommend that business and labour devise workplace solutions to facilitate adjustment and ensure that the costs of change are distributed across different parties.

Recommendation #5

We recommend that government, with business and labour support and in consultation with other stakeholders should develop land use plans for resource sectors that are developed with a long term view based on sustainable development principles. Such plans should be clear and precise. They should provide for the sustainable development of the resource and include assessment of the social, economic and community impacts as well as environmental concerns. They need to provide certainty of access for both industrial and other users.

Recommendation #6

We recommend that business and labour establish adjustment measures which go beyond a single workplace. Such adjustment measures should be designed to facilitate the transition for workers between environmentally obsolete jobs and new opportunities created. Such adjustment packages could include the following options:

- i) education/training allowances;***
- ii) counselling; and***
- iii) mobility assistance.***

Recommendation #7

We recommend that business and labour expand and improve training programs within and across different workplaces. These programs can be used as a complement to public education but would address the following types of skill requirements:

- i) computer skills;***
- ii) environmental technology skills;***
- iii) environmental auditing and management skills; and***
- iv) environmental planning.***

Recommendation #8

We recommend that business and labour carry out assessments of the changes in skill requirements and trade classification necessary to meet expanding environmental concerns. Such assessment would include the tasks of front line workers and environmental management.

Recommendation #9

We recommend that business and labour examine existing access to training programs across different workplaces and develop delivery and design mechanisms that ensure there are no systemic barriers to access.

Recommendation #10

We recommend that business and labour jointly define information needs regarding economic and environmental trends in particular sectors and suggest ways to improve the collection, presentation and dissemination of information on these trends.

Recommendation #11

We recommend that existing sectoral organizations should provide leadership and actively encourage participation by all relevant companies and unions in sectoral approaches. The methods to achieve this would include peer pressure by existing members and the collection and dissemination of successful case responses to environment pressures.

Recommendation #12

We recommend that full consultative processes be adopted which provide information exchange and communication between community groups and business and labour regarding environmental issues at the community level.

Recommendation #13

We recommend that business, labour and government provide support and leadership for community economic plans and ensure that they are consistent with long term sustainable development in the sector on which the community depends.

Recommendation #14

We recommend that governments, with guidance from both business and labour, support the documentation and promotion of good practices that integrate economic and environmental concerns.

Recommendation #15

We recommend that governments seek to establish a regulatory framework that provides clarity, certainty and uniformity in the application of environmental regulations.

Recommendation #16

We recommend that governments, in consultation with business and labour, review and improve their processes related to environmental impact assessments for resource projects and approvals process for new chemicals without compromising safety or health standards.

I INTRODUCTION

Background

In January 1992 the CLMPC published a major report entitled *Environmental Protection and Jobs in Canada: A Discussion Paper for Business and Labour*. The paper provided an overview of the state of research and outlined the primary issues on the relationships between environmental policies and employment. As a result of this report, which was well received in both government and private sector circles, the CLMPC was asked by Human Resources Development Canada (HRDC) to examine the impact on jobs, work practices and production of environmental pressures in certain industrial sectors.

The project has been guided by a joint business labour Task Force. The aim of the Task Force report is to examine ways in which business and labour have responded to environmental pressures and to document the policies and practices of greening productivity at both the workplace and sectoral levels. From the description of specific examples of good practice some lessons can be distilled on adjustment to environmental pressures. These lessons form the basis of the recommendations of this report.

Methodology

Current research on the economy and environment indicates that the overall effect of environmental regulations and environmental expenditures on macro level indicators of output and employment is very small.¹ Job and output losses in one area are counterbalanced by employment and production growth in other areas of the economy. On a sectoral basis, however, some sectors clearly do face heavier environmental responsibilities and costs than other sectors. In these instances the employment and output effects can be significant. Moreover, the fact that many firms in these environmentally sensitive sectors are in remote communities heightens the impact of environmental concerns on jobs and the local economy and poses real challenges for adjustment.

At the same time very little, if any, research has been done on how adjustment by both business and labour to environmental responsibilities occurs at the sectoral and workplace levels.² One of the first tasks of the project was to develop a research methodology. After extensive consultation with business and labour groups, the Task Force approved a case study methodology to obtain information on practices and responses to environmental pressures at the workplace and sectoral levels. The case study evidence would be supplemented by evidence from sector profiles and the environmental pressures they face. A further dimension to increase the available information was to provide examples of international practice and models of adjustment to environmental concerns.

To choose the case studies the Task Force agreed upon a set of criteria. Cases should have significant economic and job impacts and there should be accessible data available on the specific nature of the responses. The cases chosen should also provide a rich diversity of themes and issues relating to environmental change including enterprise issues, community issues and sectoral issues. Where possible, the cases should reflect both large and smaller enterprises and be located in different regions of Canada. Finally, a critical criterion was that both business and

labour were active participants in the case study research since the success of research on such cases is greatly dependent on the active consent of both parties.

The Sectors and Workplaces Chosen

The study concentrates on cases from the forestry and forest products, chemical and mining sectors. These sectors were chosen because they are generally recognised as being sectors where environmental costs and responsibilities were above average. Public opinion surveys also rank these industries as the three most likely to affect the environment.³

In each of the sectors a sectoral response has been identified along with workplace examples of adjustment. The cases are described in detail in an accompanying background document. Summary information is contained in Table 1. The primary data for the study is therefore practical experience. One of the uses of this report is the documentation of many of these practical steps for practitioners in the area of greening productivity.

It should be stressed that, although the report highlights sectors with heavy environmental responsibilities, the conclusions it draws can be applicable to other sectors. This is especially true as the range of environmental concerns expands and as expressions of these concerns emanate from a greater diversity of sources.

It is important to note two key features of environmental issues which are reflected in the research. First, environmental concerns do not exist in a vacuum — they are inextricably linked to the economic restructuring that is occurring. It is simply not possible, nor even useful, to isolate a pure environmental effect. Instead, all cases reviewed have both an environmental component and an economic component. While the cases in this project focus on those examples where a significant environmental component is present, they contain differing mixtures of market and environmental elements. Second, environmental issues tend to be long term, and as such eschew short term fixes. Again, the project tried to reflect this in examining those initiatives where long term strategic planning has occurred.

Outline of the Report

The next section will discuss the growing importance of the environment for both business and labour, in particular the relevance of the environment for the sustainability of their activities. Section III briefly describes the sectors and environmental pressures they face. Three cases of sectoral responses are discussed. Lessons from the workplace case studies are discussed in section IV. Finally, conclusions and recommendations are presented in section V, based upon the knowledge gleaned from this research. The relevant international experience is woven into the discussion to provide some comparative analysis of Canadian practice.

**TABLE 1
THE CASE STUDIES IN SUMMARY**

Case	Location	Type	Sector	Salient Features
National Forest Strategy and Forest Accord	National	Sectoral	Forestry	Government led process with multi-stakeholders, to develop a strategy for a sustainable forest eco-system.
Whitehorse Mining Initiative	National	Sectoral	Mining	Government facilitated multi-stakeholder process to establish principles for the long term sustainability of the sector.
Responsible Care	National	Sectoral	Chemicals	Voluntary initiatives among companies to agree on codes of practices for chemical research, manufacture and handling.
BC Forest Renewal Plan	B.C.	Sectoral	Forestry	Government brokered multi-stakeholder process to develop a long term plan for the sector.
InterFor & IWA	B.C.	Workplace	Wood	Joint process to seek alternatives to layoffs in environmentally threatened location.
Howe Sound Pulp and Paper & CEP	Port Mellon, B.C.	Workplace	Pulp & Paper	Sweeping modernization of plant; investment in new environmental equipment.
Highland Valley Copper & USWA	Logan Lake, B.C.	Workplace	Mining	Union-management initiative to reduce, reuse and recycle mining supplies and provide work opportunities for workers with limited injuries.
Brunswick Smelting & USWA	Bathurst, N.B.	Workplace	Mining	Joint initiatives to change work practices to improve environmental performance.
Quintette Operating Corporation	Tumbler Ridge, B.C.	Workplace	Mining	Environment committee; heavy community dependence.
Bayer Rubber & CEP	Sarnia, Ontario	Workplace	Chemicals	Environmental initiatives amid cost pressures through agreements with unions.
Uniroyal Chemical & USWA	Elmira, Ontario	Workplace	Chemicals	Crisis and shutdown of production following discovery of pollution of waste water and subsequent development of new environmental responsibility.

For greater detail on the case studies see Background Report, available upon request.

II THE IMPORTANCE OF ENVIRONMENT

The environment has been an issue of public concern for at least two decades. Recently the discussion of the environment has changed in a number of significant ways that has and will continue to affect both business and labour. As these groups are beginning to come to grips with environmental issues they also have to deal with the shifts in how these pressures are manifested.

Shifts in the Environmental Agenda

Public opinion

Surveys of public opinion indicate that the environment has become an area of underlying importance as a public policy concern. The importance of environment in such surveys does fluctuate as other issues flood the public policy agenda. Environmental concerns rank higher in good economic times (ranking first in 1989) and lower in times of economic uncertainty⁴. Current figures on public opinion are disproportionately affected by concerns over both political and economic issues; the environment — as a public policy issue — is very low. However, low importance as a public policy issue does not mean that individuals do not consider environmental questions important and make individual decisions accordingly. A recent CLMPC survey indicated, for instance, that over 70 percent of business leaders and over 90 percent of labour leaders believe the environment to be a problem facing the economy.⁵ Moreover, the continuing media coverage of environmental issues and the fact that the environment is now regularly included on a list of public concerns points to an underlying and permanent concern in the long run.

International focus

Over the last three decades environmental issues have achieved a more global focus as environmental consciousness has spread internationally. Environmental problems in the 1960s and early 1970s were mainly local ones, but by the mid 1980s they had become global ones as witnessed by the growth of international agreements on the environment.⁶ Before 1975 there were less than 10 international agreements relating to the environment; but by the mid 1990s there were over 30 such international agreements. The largest and most comprehensive of these is Agenda 21 which was adopted at the UN Earth Summit in 1992. It represents a major consensus document on environmental issues as well as a wide range of issues that are related to solutions to environmental questions. While Agenda 21 does not impose binding legal commitments on governments, its adoption nevertheless represents a political commitment at the highest possible level and now includes conventions on hazardous wastes, biological diversity, the ozone layer, and climate change. This shift in perspective has important implications for both companies and workers that do business internationally.

Rise of the customer

A further shift has been a drive for greener production led by customers. Customers are concerned about the environmental impact of both the final products and of the production processes and resource extraction practices adopted. For example, in the forest products sector customers have variously demanded chlorine free pulp production, higher recycled content in newsprint and improved forest practices. Demands for sunsetting some chemicals because of concerns about their toxicity are also being made. In the mining sector some environmental practices have come under scrutiny and led to calls for sustainable mining. The result is that for export industries such as forestry, mining and chemicals the environmental awareness of international customers will, through market pressures, affect practices in Canada.

Finance and Environmental Risk

Financial institutions are increasingly conscious of the environmental risks of certain companies and operations. Companies that apply proper environmental management and sustainable production will have easier access to finance for ventures than less environmentally secure operations. All Canadian banks require external environmental audits for new business loans in cases of potential environmental concerns. The access to capital can thus be an important lever for ensuring good environmental performance.

Government approaches

Changes in government approaches to the environment are also occurring. Many countries, including Canada, have sought to broaden the range of instruments and policy options that can deal with the complex problems of environmental concerns. The federal government introduced the Canadian Environmental Protection Act in 1988; the Act is currently being amended. Recent proposals indicate that the federal government is seeking to establish CEPA as framework legislation. Provincial governments have also looked for innovative methods to address environmental issues. At the same time there has been a growth of voluntary agreements as a supplement to environmental regulation in different countries.⁷

Different approaches are being pursued by different governments. Some governments in North America and Europe are moving towards initiatives on pollution prevention rather than regulating emissions. The government response in Canada to proposed amendments to CEPA certainly embraces the pollution prevention ethic. In Britain, the Integrated Pollution Control Policy regulates the release of pollutants on an industry by industry basis as opposed to separate regulations for air, land and water. These standards have been established through stakeholder consultation. In the U.S. the Environmental Protection Agency is pursuing a similar strategy with stakeholders to encourage voluntary actions on pollution prevention.

On the other hand, the Netherlands established a comprehensive National Environmental Plan (NEP) in 1989 which sets out ambitious goals on greenhouse gases, emissions ceilings, energy conservation measures and toxic emission reduction. The NEP also included agreements between industry and government on actions to reduce emissions. Thus far over 100 such agreements, as an alternative to regulation, have been reached

which cover 90 percent of all industrial pollution. The search for different approaches by government will have important impacts on the activities of industry and workers.

All these factors — the shifts in public opinion, a global focus, changing customer demands and alternative government approaches — highlight the environmental pressures that are likely to expand and intensify. As a result, all Canadian industries are likely to experience some of the problems that faced the sectors and workplaces described in this report. The practices outlined in the case studies could be of importance to these other industries in the future.

Business and the Environment

These shifts are changing the way in which companies address environmental concerns. Environmental issues can in some cases give Canadian companies an advantage in global markets. Certainly environmental considerations are important among commercial organisations — a survey of commercial organisations found 87 percent of respondents considered environmental issues to have important impacts over the next five years.⁸ These figures were slightly higher in the resource and manufacturing sectors. The sources of concern included the following:

- *Environmental compliance:* Environmental compliance with regulations has always been an important part of resource and manufacturing companies and is still a significant concern for companies in these sectors.⁹ However, the shifts in environmental pressures and the changes in government approaches affect the internal operations of the companies in many different ways. As a result, business has become involved in broader initiatives with government on the environment.
- *Customer requirements:* Companies have come to realise that the environment is an important part of their competitive armoury. With customers both within Canada and internationally demanding more information about the environmental impacts of certain products and production methods, companies themselves have to acquire more information concerning their activities and their relation to the environment.
- *Cost savings:* There are good economic reasons for better environmental performance, as some companies are discovering that these can improve their balance sheet. Better use of energy in production, for example, is an important area where companies have been able to produce the same outputs with less energy, reducing both demands on the environment and costs.
- *Liability of officers:* Directors and officers of the company are often held personally liable for environmental situations in their organisations. Penalties have ranged from fines against which the company cannot indemnify the officers; to jail sentences.

- *Employees:* Employees are also making demands for a healthier environment and can be an important factor in a company's environmental concern. In the survey of commercial organisations, 62 percent of respondents identified employees as a motivating factor for environmental concerns. These figures were lower in the resource and manufacturing industries.

The end result is that companies seeking to protect and enhance their market position will have to make changes to their operations, otherwise their future survival may be in jeopardy. In addition, respecting environmental concerns is important for the growth of business. There are numerous examples of the ways companies have attempted to integrate environmental factors into planning and decision making.

Environmental management melds very well with various management systems approaches. Both management systems approaches and environmental management emphasise the importance of customers in the broadest sense. Commitments to continuous improvement are useful to companies that wish to go beyond simple environmental compliance and would prefer a more pro-active approach to environmental concerns. Much of environmental management also seeks to focus on root causes and to address the problems of pollution prevention rather than end-of-pipe solutions reflecting the concerns of government and environmental groups. Such shifts are moving environmental and sustainability issues back up the production chain and increase the importance of integrating environment into business planning. Furthermore, flexibility in the chosen solution to environmental problems permits greater efficiency in the use of capital. Environmental practices also place greater importance on front line workers and their contribution to environmental management — a concept which, again, is part of the management systems philosophy.

Such business planning requires information about environmental factors. As a result companies increasingly are undertaking environmental reporting and auditing. As well as providing an important source of information for accounting for environmental liabilities, such activities are a means of ensuring that companies maintain contact with and respond to changing environmental demands. Beginning with the early success of companies like Monsanto Co. in the U.S. and Norsk Hydro AS in Norway, environmental auditing and annual environmental reports have grown rapidly.¹⁰ Given the likelihood that the costs of environmental damage will rise, financial analysts worldwide increasingly will demand environmental reports.

Shell Canada is one of a small group of companies that are attempting to link the content of their environmental reports to sustainable development. Shell established an Environment Fund with an initial contribution of \$5000. The important ingredient in this was the impetus provided by the CEO who, together with the Board of Directors, was responsible for implementing accountability reporting measures down to the production level. Increasingly, the company is moving towards measuring results and operating on the principle of prevention by eliminating problems at the design stage.

Demands from customers for environmental quality of production and products inevitably also leads to backward linkages with suppliers. Many companies, armed with information from their environmental monitoring, are now insisting that suppliers meet certain requirements regarding the environment. In Britain, for example, the largest do-it-yourself chain, B&Q, is part of a group of companies that is promoting a system to judge the environmental performance of suppliers and can identify whether each piece of wood it buys comes from sustainably managed forests. In the United States, S.C. Johnson (a producer of household cleaning products), through forthright communications with its suppliers has improved its environmental performance on packaging by greatly reducing the amount of material used, increasing recyclable content and developing new 100 percent recyclable packaging materials. Such initiatives can affect not only the supplier methods of production but can link forward to ensure full product stewardship.

Chemical companies both in Canada and internationally are indeed committed to such initiatives, though in cases where chemicals are exported out of the country, product stewardship may be hampered by limitations on re-importation of waste substances.

From individual initiatives within companies, these same goals are apparent in moves to develop a series of environmental management standards across entire sectors. These were initially voluntary programs and agreements and initiatives for particular sectors. Such management standards are now being developed that would apply broadly across countries (such as the European Eco-Management and Auditing Scheme (EMAS), the International Organisation for Standards (ISO) 14000 series and British Standards (BS) 7750). It should be noted that these are management standards as opposed to specific technical standards. Calls for eco-labelling reflect the same desire for identifiable standards of quality.

Minimum impact production with reduced energy use is a common pre-occupation with both a financial balance sheet aspect and an environmental component. The development of cleaner production has been the main thrust of environmental management for over two decades. Attention is moving back up the production chain to conservation of resources and prevention of pollution at source. In Canada, Inco has achieved substantial reductions in energy use and emissions through a comprehensive sulphur dioxide abatement program. In the mid 1980s the company adapted its smelting flash furnace which led to a major improvement in energy efficiency and costs. The formerly emitted sulphur dioxide gases were turned into saleable products. As well, there were improvements in worker productivity.

In the U.S. the success of the Dow Chemicals Waste Reduction Always Pays program was due in no small part to getting the employees involved in participating in the program and to establishing open communications with the local community. In Sweden, the cement manufacturer Holderbank sought to improve energy efficiency by enhancing the skills and motivation of managers and workers to make products more efficiently. Again, involvement and motivation of employees was key. Significant energy improvements were made with little capital investment.

Enhanced attention to environmental concerns and associated costs can also lead to the exploitation of opportunities. Environmental investments can result in profitable

activities. For example, the expertise developed in mining reclamation has made Sudbury a centre of world leading companies in such techniques. Environmental activities are typically regarded by financial institutions as simply a cost item for companies. However, there are several examples to indicate this is not necessarily the case.

The growing integration of environmental management into the business operations of the company is indicated by U.S. surveys which show that responsibility for environmental concerns are being shifted further up the corporate structure. In many cases, CEOs are becoming increasingly involved in environmental matters. In addition, the number of full time employees with responsibility for environmental issues has grown significantly in the last two years.¹¹ Such matters as already noted have moved beyond simple policing and compliance to regulations. Taken together, this raises the question of the types of skills environmental managers and executives will need to have and whether new environmental and managerial skills will need to be acquired.

Evidence from Europe suggests that environmental management has become increasingly complex, and that senior executives are crucial figures in achieving good environmental performance or otherwise. One challenge is that environmental executives must retain their specialist skills while becoming more outward focused, capable of managing different tensions and politically adept.¹² The Canadian Council for Human Resources in the Environment Industry is currently documenting the skills sets needed in the environmental industry and are seeking to develop national occupational standards in environmental professionals.

In short, companies are responding to the shifting environmental agenda. However, it is likely that pressures to further respond to environmental concerns and responsibilities will increase. Environmental performance will assume greater importance in the long term survival of companies.

Labour and the Environment

Labour unions are also affected by the shifting tide of environmental concerns. Labour's concerns relating to the environment include:

- *Long term survival:* The environment has become important to customers of producers. If nothing is done to protect the environment and ensure the integrity of the production process, the company and hence the jobs will not exist in the long run. On such an issue business and labour face a common predicament.
- *Adjustments to job shifts:* In the immediate term certain environmental regulations can dramatically affect jobs (e.g. reductions in annual allowable cuts in forestry or cancellation of a mining project). However, the issue is not simply one of environment versus jobs since, while some jobs may disappear in the short run because of environmental factors, other areas of the sector can benefit and provide employment possibilities. In some sectors such as forestry, such job losses have often exceeded job creation. Unions have been concerned that new jobs

remain within the union. Concern thus focuses on adjustment and the transition process of helping displaced workers so that the costs of change are borne proportionately.

- *Health of workers:* The quiet and unseen daily accumulation of pollutants from leaks, spills and normal operating procedures often have considerably more impact in the long run than major industrial accidents. Improving the working environment and protecting the health of workers is a key consideration.
- *Shared responsibility in workplaces:* As an important part of the production process, labour must share responsibility for activity in workplaces and the surrounding community. Actions to improve the environment are part of this responsibility and will affect the environmental performance of the sectors in which workers operate. Joint environmental committees have been employed to meet this responsibility for the environment.
- *Particular knowledge:* Workers have special knowledge of the very basic tasks that are performed. This includes knowledge about environmental hazards and sources of hazards and accidents. Workers therefore may be the first to recognise that certain environmental management systems are not working 'on the ground'. In addition, in continuous operations workers are on the site through all hours of the day and have particular responsibilities in the absence of management.

To respond to these concerns and responsibilities regarding the environment unions have turned to the collective bargaining process as well as to environmental committees, education and training schemes, coalitions with other groups and sectoral strategies.

Unions have used the collective bargaining process to address environmental issues and insert green clauses. In the UK the General Municipal, Boilermakers and Allied Trades Union has developed a model environment agreement which has formed the basis for negotiations with employers. Interestingly, the publicity campaign by the union highlighted the positive role played by the union and the employer in fashioning these agreements. In 1992 the Australian Manufacturing Workers Union introduced an innovative project to incorporate environmental performance as a productivity measure in collective bargaining. This would reward workers who improve the operations of the company by reducing waste and making better use of resources. A further benefit is that this would encourage a shift from pollution control to pollution prevention with local agreements representing a chance for workers to influence environmental performance at the workplace level.

At the workplace level, the concern with the environment and its effect on health is an outgrowth of occupational health and safety, and similar structures have been established to manage it. With a given structure in place environmental issues in the workplace are easier to manage, rather than creating new administrative structures. While joint occupational health and safety committees have a legal foundation in most jurisdictions

of Canada, the same is not true for environmental committees. Environmental committees are generally negotiated through collective bargaining though future recourse to due diligence in law in relation to environmental accidents can be a means to establish an environment committee.¹³ The prevalence of environmental committees varies by industry, being more common in manufacturing facilities than resources sites.

One of the key elements in dealing with health in the workplace has been the demand by unions for protection in terms of the right to key information on the health impacts and the right to halt operations if they are considered too risky. The absolute right to close down production is not widespread, leading to calls for whistleblower protection for union members.

While the right to know and the right to decide are important elements of a union's strategy on health, unions have also become involved in education and training as a means of raising environmental awareness among its membership. It is important that members understand the substances and the effect of these substances on the work environment if these issues are to be addressed. Unions have thus provided technical support to help union members become more informed about environmental matters. One of the important skills that such training can provide is how to perform environmental audits of companies and workplaces.¹⁴ In France, for instance, legislation provides for members of the health and safety committee in the classified hazardous installations to undergo union-run training on the environment without loss of pay. Environmental issues have also been addressed through the collective bargaining process by the insertion of green clauses.

Accidents have also triggered responses to environmental problems both within the workplace and on a broader societal level. A significant event in this regard was the Bhopal accident of 1984 which led to much re-thinking within the chemical industry both in Canada and other countries. A fire at a chemical plant in Basel, Switzerland was a catalyst for a sectoral agreement in Germany between the IG Chemie union and the German Chemical Industry Association on environmental impacts. This agreement has existed for over eight years and provides for joint co-operation in screening existing chemicals and new products, and joint discussion at the company and workplace level on environmental questions including transportation of hazardous materials. Such sectoral agreements have led to detailed workplace arrangements. By 1991 IG Chemie had concluded environmental agreements at 47 workplaces. In 1991, an agreement between employers and the Belgian chemical industry in essence extended the jurisdiction of the joint workplace safety committees to environmental matters even though there was no legal obligation to do so.

Unions have also formed coalitions with interested environmental groups. This can happen at the local or national level. In Denmark, most of the co-operative arrangements on the environment have occurred at the local level with very little activity at the national level. The General Workers Union (SID), whose membership includes workers from transport and waste disposal industries, is very active in this area. It has developed new methods of waste handling and recycling, collection of waste and re-usables. Training courses have been developed, and it is quite common for companies to send their

employees on these courses. This reflects the importance employers attach to involving front line workers in proper training and education on the environment.

At the international level, unions have also been active in defining practices. The International Federation of Building and Wood Workers (IFBWW) has developed and adopted trade union policy on forests in cold and temperate regions and encouraged sustainable forestry management. The guidelines call for specific measures to protect the forests as well as the associated jobs in the sector. A precondition of this is the reduction of pollutant emissions in the forestry sector. The IFBWW policy contains guidelines on sustainable forestry policy, appropriate technologies, wood marketing and certification of lumber.

Unions have been instrumental in developing more environmentally sound products and practices. In Canada the IWA and International Forest Products (InterFor) have developed a joint environmental initiative at worksites where joint committees have input into ways of environment improvement on site. The result has been the creation of a Best Environmental Practices List which acts as a blueprint for environmental practices and standards across the company. Painters' unions in Sweden have been responsible for the development of paints that are less harmful to the environment and workers' health. This was a concerted campaign over several years and involved the paint companies, the chemical companies who made the paint ingredients, and the contractors who employed painters. Such an example is in contrast to Denmark where the development of such paints was the direct result of legislation.¹⁵

In terms of adjustment issues unions have often been faced with the task of reacting to situations and negotiating adjustment packages, in some cases for downsizing. A more proactive approach is to try to identify the potential for green jobs and which jobs may be under threat from environmental pressures.

In Australia, a Green Jobs Unit has been established as a joint project between the Australian Conservation Foundation and the Australian Confederation of Trade Unions (ACTU). This was a result of the development of the national strategy for Ecologically Sustainable Development which was developed through consultations with business, labour and conservationist groups. The Green Jobs Unit is funded by the Department of Employment, Education and Training for three years. Its objectives are to promote green jobs with unions, business and government; to develop policies and incentives for increased green employment; to link labour market programs and training for unemployed people to green job opportunities in industry; and to develop pilot projects for new green jobs.

The Unit has undertaken a Green Jobs Development Project designed to fill a gap by linking labour market programs to future employers through placing unemployed persons for an initial six month period in environmentally useful jobs. This is intended to enhance the employment readiness, particularly of young workers, in environmental work and to increase the likelihood of longer term employment in these positions by demonstrating the value of such work to the organisation.

Unions have also been instrumental in sectoral approaches to adjustment, be it resulting from economic or environmental factors. In the steel industry, the Canadian Steel Trade

and Employment Congress (CSTEC) was established jointly by the United Steelworkers of America (USWA) and steel employers. CSTEC has provided adjustment assistance such as counselling, local adjustment committees, development of a national job bank and a skills training program. The program has been successful at dealing with the fundamentals of both downside and upside adjustment issues and is an innovative example of a business-labour approach to a sector facing adjustment problems.

At the same time unions have recognised the importance of the local community and their concerns about the environment. This is particularly important in remote communities and less economically diversified areas where adjustment may be harder to achieve.

Poor environmental performance in the workplace can have an adverse impact in the local community and can create tensions between workers and community groups. Unions have often established coalitions with community groups to promote trust and good relations with community groups. Many unions, like many local companies, see the maintenance of strong links with the local community as important in any environmental strategy.

Conclusion

The environment is an important and growing area of concern for both labour and business. The long term survival of both groups in a certain location and the opportunities for growth in employment, income, and revenues are dependent in no small part on improved environmental performance in production and the workplace. Relations with the community are important to both labour and business in addressing environmental issues. Proper consideration of the community is evident in the case studies.

III SECTOR PROFILES AND INITIATIVES

Three sectors identified in the consultation phase of this project all bear significant environmental costs. This section briefly profiles these sectors and situates the various environmental pressures that companies in those sectors face. Three sector responses to these pressures are identified and briefly described, together with some lessons from the sectoral approach. These sectoral responses are the National Forest Accord, the Whitehorse Mining Initiative and the Responsible Care Initiative. These are not the only examples of sectoral responses; other initiatives are identified briefly which help to provide important lessons that are summarised at the end of this section.

Forestry and Forest Products

The forestry and forest product sector is Canada's largest exporting sector and accounts directly or indirectly for approximately one million jobs. Approximately 350 communities throughout Canada are dependent on forest activities, particularly in British Columbia. The forestry and forest products sector (which includes harvesting, lumber and pulp and paper) faced substantial losses in net earnings in both 1991 and 1992. While pulp and paper has rebounded dramatically in 1994 and 1995 as prices more than doubled, lumber markets have remained stagnant after rising in 1993. Despite increased profitability for some operations the sector still faces some long term problems which include:

- *Fibre Supply.* A long term objective is to ensure that sustainable harvest levels are achieved.
- *The Disappearance of Low Cost Energy.* Low cost energy used in processing, particularly electricity, has largely disappeared.
- *New Global Competition.* The sector faces increasing competition from softwood lumber producers in the former Soviet Union and Brazil as well as new pulp facilities in Brazil, Chile and the U.S. and new newsprint operations in the U.S., Germany, the former Soviet union and Korea.
- *Older mills.* A fundamental problem in the pulp and paper industry has been the smaller size and older technology of many of Canada's mills compared to its international competitors. Although Canadian producers have made recent attempts to correct this situation, it still remains a concern.
- *New technologies and employment.* New technologies introduced to achieve productivity improvements have allowed more harvesting to be done with less labour and in the future could threaten the number of jobs in the sector.
- *Trade Actions.* Trade barriers and actions to limit trade have occurred periodically. Such measures create uncertainty and dissuade new investment from taking place in the sector, which is very export dependent.

TABLE 2
ENVIRONMENTAL PRESSURES IN
FORESTRY AND FOREST PRODUCTS

Industry	Environmental Pressure	Concerns
Harvesting	Land Use	<ul style="list-style-type: none"> • Major issue in B.C. • Plans to conserve old growth forests and double park land • Affects harvestable area
Harvesting	Forest management	<ul style="list-style-type: none"> • Harvesting practices a concern for European consumers • Boycott of products made from clear cut forests • New forest practices codes in B.C. and Ontario
Harvesting	Toxicity of Herbicides & Pesticides	<ul style="list-style-type: none"> • Low priority concern
Wood	Kiln dried Lumber	<ul style="list-style-type: none"> • Some European banned softwood untreated for pinewood nematode • Curtails market access and adds to costs of lumber production
Wood	Chemicals in wood treatment	<ul style="list-style-type: none"> • Concern over leaching from pressure treated lumber into soil • Hazard to health of workers
Wood	Wastes Disposal	<ul style="list-style-type: none"> • Disposal of sawdust, shavings and bark residues • Solution has been MDF production
Wood	Formaldehydes	<ul style="list-style-type: none"> • Used in MDF and OSB production • Occupational health issue for workers
Wood	Verification of practices e.g. eco-labelling	<ul style="list-style-type: none"> • A guarantee that certain product requirements are met • Concern that verification procedures could be used to block market access
Pulp & Paper	Recycling	<ul style="list-style-type: none"> • Pressure on landfill sites led to higher recycled content requirements in U.S. • Insufficient recycled newsprint available in Canada • Import recycled newsprint and install de-inking processes
Pulp & Paper	Solid waste management	<ul style="list-style-type: none"> • PCBs are present in stored solid waste • New PCB treatment facility in Alberta • Concern over transport of hazardous materials
Pulp & Paper	Effluent	<ul style="list-style-type: none"> • Discharge level fallen in the last decade • Environmental compliance • Demand for chlorine free paper in Germany • New regulations took effect January 1, 1996 • PAPRICAN working on closed loop systems
Pulp & Paper	Air emissions	<ul style="list-style-type: none"> • Main concern is odours and particulates • Emissions include acid gases, sulphur dioxide, nitrogen oxide (NO_x) and volatile organic compounds (VOC) which are subject to regulation • New air emission systems to limit hazardous wastes

Although the cyclical downturn has abated in pulp and paper, the confluence of these forces still pose some difficult challenges for the sector. While much restructuring has occurred and employment is steady overall, one recent study has warned of future job losses.¹⁶

Environmental Pressures

Like any resource industry, the forest sector has faced significant environmental pressure over the last two decades (see Table 2). A recent report concluded that forest products is the industry that has been most severely affected in trade by environmental measures.¹⁷ As Table 2 clearly shows, the environmental pressures vary in the different areas of the sector.

The major environmental pressures in the harvesting sector are primarily related to land use and forest management. The land use question in B.C. and preservation of old growth forests has been subject to a number of public consultation exercises as described in the Forest Renewal case study in the background document. Concern has been expressed by European consumers over harvesting practices, which has affected sales to Europe. New codes of practice for forest management have been introduced in both B.C. and Ontario and substantial effort has been put into both improving land use and forest management. One of the consequences of harvest reductions is higher lumber prices which can affect the ability for the sector to shift to new products and processes.

In the wood sector, some producers have found their market access curtailed in Europe where a number of countries have banned the use of green lumber because of the possibility of pinewood nematodes in softwood lumber. Kiln drying lumber adds to the cost of production. The use of chemicals for wood protection and preservation has also raised concerns about workers' health, hazards to aquatic life, and leaching of chemicals from pressure treated lumber into soils.

A further area of environmental concern has been the disposal of surplus sawdust, shavings and bark residues. Solutions have included using the wastes for co-generation of electricity, and increased production of particle and fibreboards (MDF) which are composed of such waste products. In turn, production of particleboards such as MDF and OSB¹⁸ has raised environmental concerns about workers health since urea-formaldehyde (UF) resins are an integral part of particle board production. Finally, the wood sector is facing demands for verification of sound environmental practices such as eco-labelling of products. Such verification procedures are a pre-requisite for market access, and the industry is concerned that they could act as a non-tariff barrier to deny access to international markets.

The pulp and paper industry has faced a number of important environmental pressures. A major environmental impact has been felt, for example, in the areas of recycling following pressure on landfill sites in many U.S. states. But with insufficient recycled newsprint available in Canada to meet the higher recycled content rules for newsprint in the U.S., Canadian companies are having to import recycled newsprint and establish de-inking facilities to process newsprint (at an average cost of \$30 million) in order to access

the U.S. market. De-inking plants also have environmental repercussions since disposal of the remaining sludge is an issue.

Solid waste management is an important area of concern because of the presence of PCBs in stored waste. The opening of a treatment facility in Alberta has encouraged the transportation of this material from other provinces, most notably B.C. and Ontario, and led to fears concerning accidents in transit. The nature of the industrial process means that wastes flowing into water sources, in particular the total suspended solids (TSS) that affect biological oxygen demand (BOD), are areas where environmental compliance is important. In fact, discharge levels have fallen significantly and consistently over the last decade. Research is continuing on closed loop systems.

Demands for chlorine free paper were made in the early 1990s, although the concern on the part of consumers appears to have fallen away.¹⁹ Similarly, air emissions from pulping, particularly acid gases such as sulphur dioxide and nitrogen oxides as well as chlorine and volatile organic compounds (VOC), are subject to environmental regulations and have led to new effluent control and air emission systems to limit hazardous wastes, particularly PCBs, in the pulp and paper sector. The main environmental concern here is over odours and particulates.

One area where the pulp and paper industry has made significant progress has been in energy use. While pulp and paper production has increased by 20 percent between 1990 and 1994, the total energy consumption fell by 5 percent. Over half the energy used was generated through biomass sources such as pulp liquor and waste wood. In addition, energy conservation programs through local utilities have reduced energy use and led to reductions in carbon dioxide emissions.²⁰

National Forest Strategy and the Forest Accord

The Brundtland report in 1987 (formally known as the Report of the UN Commission on Environment and Development), which called for sustainable development as a means of preventing continuing damage to the environment, helped bring many environmental concerns to the forefront.²¹ Sustainable development was defined as economic development that would meet the needs of present generations without compromising the ability of future generations to meet their needs. This definition went to the heart of sustainability concerns in the forestry industry world-wide. In Canada the Canadian Council of Forest Ministers began a process in 1990 to seek the views of a wide, diverse set of Canadians. Included in these consultations were representatives from labour unions, forest companies, naturalists and wildlife groups, aboriginal people, foresters, private forest landowners, academics and federal and provincial governments.

The result of this extensive consultation process was the signing of the Canada Forest accord in 1992 and publication of a new National Forest Strategy (NFS) entitled *Sustainable Forests*. The National Forest Strategy is intended as a guide to the actions of all parties with an interest in the forest, to work through specific actions towards the goal of sustainable development in forestry over five years up to 1997. Important to this goal was the inclusion of both timber and non-timber values in the strategy.

The NFS recognises the diversity of forest eco-systems. In order to guarantee this diversity for future generations, the strategy outlined areas of action which were agreed to by all the participants. These include:

- increasing the knowledge and ability to manage forest eco-systems and maintain diversity in forests;
- developing forestry practices that respect all values in the health of the forest;
- ensuring greater public input into forestry decisions;
- facilitating adjustments to the necessary changes in order to provide jobs and economic benefits to communities while maintaining the competitive position of the industry, through such activities as increasing value-added production and uses for under used species of trees;
- undertaking additional research on information needs, new forestry and manufacturing technologies, to ensure sustainable forestry and improve competitiveness in the sector;
- enabling the workforce to contribute to sustainable forest management through the review and development of new training programs on the changing skills needed;
- increasing the participation of aboriginals in forest land management to ensure aboriginal treaty rights are respected and economic benefits flow to aboriginals;
- assuring greater stewardship of forests through improved practices on private lands;
- pursuing international standards and recognition of Canada's international responsibilities with respect to forestry.

These areas are explored in greater detail in the background report on the case studies.

One of the challenges that the NFS faces and tries to address is to translate these areas of priority into specific actions. The NFS presents some 96 commitments to different actions over a five year period. Progress towards the goals of the NFS are to be monitored by a National Forestry Strategy coalition composed of representatives from the signatories to the NFS. Independent evaluations of the progress made by the strategy will be undertaken at the mid and end points of the 5 year plan.

The mid-point evaluation, completed in September 1994, reported progress in several areas. A network of 10 model forests involving 250 organisations has been established to provide a testing ground for new ecologically and economically sound forest management practices. Most provinces now require forest companies to state prior to harvesting how their activities will affect soil, wildlife and climate on crown lands. Furthermore, professional forest and industry associations have developed new codes of practice and have signed an international set of principles for the sustainable development of forests.

Increased financial resources have been used by government and industry to develop environmentally sound forestry technologies. Efforts to improve forest management practices have occurred in several provinces and a number of professional associations have adopted codes of ethics in this regard. Importantly from the point of view of the current project, governments, business and labour have engaged in plans to address the changing needs of the workforce as new technologies impact on forest sector jobs. For instance, an assessment has been made of the feasibility of developing a certification system for silviculture and forestry workers to increase the skills and mobility of the sector's workforce.

The mid-point evaluation also pointed to the need for more work in key areas such as completing an ecological evaluation of forest lands; completing a representative network of protected areas; developing forest inventories on a wide range of forest values; and developing a system of national indicators on sustainability of forest management.

The importance of the NFS is that it is a national strategy for the sector which is overseen by government but has been achieved through a process of involving all parties with an interest — economic, ecological or social — in the forest. The strategy represents a significant departure from the often adversarial relations in the sector. The challenge for the NFS is to translate the consensus on priorities and commitments into specific actions that will lead to sustainable forests.

Other Initiatives

The NFS is not the only multi-stakeholder process that has been undertaken to deal with the environmental pressures and issues in the forestry and forest products sector. Two others are considered here. They are the BC Forest Renewal Plan and the Forest Round Table on Sustainable Development undertaken by the National Round Table on the Environment and the Economy.

BC Forest Renewal Plan

The BC Forest Renewal Plan is significantly different from many of the other sector initiatives identified here and is fully described in the background report on the case studies. The forestry sector is the single biggest contributor to the British Columbia economy, but by the early 1990s the B.C. forestry industry was showing some signs of strain. Better management of the forest and improved practices of harvesting were called for, and there were increased pressures for sustainable forestry, particularly from consumers in Europe.

Following earlier initiatives on land use and forestry (detailed in the background report), a Forest Sector Strategy Committee (FSSC) was established in early 1993. This was a multi-partite advisory body made up of labour, industry, environment, community, government and aboriginal groups charged with the task of developing a long term strategy for the forest sector. An initial product of this work was the Forest Renewal Plan (FRP). The FRP is administered by a multi-stakeholder board of 18 members drawn from forestry companies, unions, environmentalists, First Nations communities and government. The FRP was financed through a special fund raised by increased stumpage fees, and by legislation dedicated to forest and related activities only.

The FRP is an incremental plan to allay past damage to, and improve the quality of, the resource. Spending programs of the fund, which are controlled by the board of Forest Renewal BC, are concentrated on five activities. Fully half the investment by Forest Renewal BC will be put to enhancing the productivity of forest lands and to increasing the value and volume of timber available for harvesting. Other expenditure areas are environmental clean-up of watersheds, roads and intensive silviculture; value added production in the wood sector; workforce training and adjustment; and community development. Greater detail on the specific programs is provided in the background report on the case studies.

Forest Round Table on Sustainable Development.

The National Round Table on the Environment and the Economy (NRTEE) first met in 1989 and includes a large number of competing interests that are brought together to discuss ways to achieve consensus on sustainable development issues. The NRTEE has undertaken a number of round tables relating to different sectors and issues.

The Forest Round Table consisted of a series of nine meetings between 25 representatives from business, labour, professional foresters, silviculturalists, wildlife and nature groups, academia, governments and aboriginals.

In its final report released in 1994, the various participants agreed upon a set of common principles on the use of Canada's forests in the future²². The set of agreed principles for sustainable development in the forest included principles relating to *i*) care of the environment; *ii*) people issues such as public awareness and involvement, aboriginal recognition, community stability, worker health and safety, conflict resolution and public health and safety; *iii*) land use; *iv*) managing resources, including tenure, codes of practice, competitiveness, economic and policy instruments and shared responsibility. In addition, the Forest Round Table produced a working paper on discussion concerning harvesting methods.

All three processes discussed in relation to the forestry sector share many similarities in terms of the issues addressed, though the multi-stakeholder approaches may have been driven by different bodies and agendas. Nevertheless, the existence of such agreements and processes signifies a more consultative approach, supported by government, than was evident in the past in addressing resource sector pressures.

Mining

Like forestry and forest products the mining sector is an important contributor to the economy and is particularly important for rural single industry communities in Quebec, Ontario, Manitoba and British Columbia. Employment in the mining sector constitutes approximately 2.5 percent of the Canadian workforce. Mining is highly focused on international markets, where in many metals and minerals (e.g. zinc, uranium, lead and platinum) Canada is a world leader. The performance of the industry is, however, highly cyclical and crucially dependent on the international prices of metals and minerals. In times of low prices the level of costs become critical. In recent years prices have been depressed. In 1992 and 1993 revenues fell and the return on assets was negative. More

recently, mining firms have returned to profitable levels by increasing productivity through better technology and mining techniques, restructuring and skills upgrading. At the same time interest rates and exchange rates have declined and prices for commodities have risen substantially.

Despite such efforts to improve its competitive position the mining industry is in a critical period and faces some long term challenges. These include:

- *Global competition.* World-wide markets have been negatively affected by the emergence of new players in the market such as the former Soviet Union and other Eastern Bloc countries who are exporting their surplus production. Added to this is the increasing use of recycled materials which can ultimately limit demand for new base metals and accentuate price swings.²³
- *Levels and Quality of Reserves.* With the exception of diamond reserves, mineral reserves in Canada are becoming more difficult to find. Ore deposits are more deeply-buried, are found in more remote areas, and in some cases are not of the former high quality, all of which add to costs. Reserves are now being mined faster than they are being replaced through exploration²⁴ and mine closures currently outnumber mine openings.
- *Competitiveness of Foreign Investments.* Foreign mining projects have become increasingly attractive in recent years, particularly in Latin and South America. As a result many mining operations are directing their investment to these countries rather than Canada.
- *Land Access and Mineral Tenure.* The question of land use and in particular time delays in settling Aboriginal land claims has and will have a significant impact on mining exploration. In addition, Native groups are making demands for jobs and a share in resource wealth. Efforts to address this problem through joint initiatives and Native participation in project development have been made.

Environmental Pressures

Mining activity has a significant impact on the environment (see Table 3). The impacts of a mine site can be substantial and land reclamation — returning the site to an acceptable condition for wildlife or other use — is subject to strict regulation. Reclamation planning and financial assurance are required before a mine is permitted to open and add to the already large up-front costs of mining. Other environmental issues raised through mining relate to water quality, especially acid drainage from tailings and pollution of water from acid mine drainage. It is particularly difficult to prevent seepage of toxics after closure of a mine. In addition, the industry is under pressure to improve its handling and disposal of toxic waste (as defined by Environment Canada and Health Canada), as well as to reduce use and emissions. Of further concern are the restrictions regarding the movement, especially the import and export, of hazardous waste. These rules are part of the Basel Convention but may affect the ability of companies to import or

export some materials for recycling purposes. Most base metals mined in Canada are sulphide minerals and, when smelted, release sulphur dioxide, a gas which can lead to acid rain. A second substance targeted for reduced emissions is carbon dioxide which results from the burning of fossil fuels. Reducing these emissions has required significant investments in new equipment and technology. Such developments have kept the industry at the leading edge of extraction and processing techniques. Often this expertise is sold abroad. At the same time the greater efficiency in operations has required fewer workers and led to layoffs.

A further pressure to improve environmental performance has come from workers who have concerns for their health. Improving working conditions (especially safety) and reducing the amount of pollutants in the workplace have a direct effect on the health of workers and the state of the environment in communities where mining operations are located.

The question of land use and access to land is a concern for the industry, especially with pledges from various governments to increase the areas devoted to wilderness and parks. The process of withdrawing mineral tenure has also caused concern in the industry.

Activities at mine sites consume significant amounts of energy. Processing activities are particularly energy intensive. Greater efficiency in energy usage benefits both the environment and energy costs. A final but critical public policy issue concerns the process of environmental impact assessment and environmental review. This area is viewed as complex, lengthy and uncertain partly because of overlaps in provincial-federal jurisdictions.

Although resources are under the jurisdiction of the provinces, there are many instances where the federal government finds it necessary to conduct its own review. The key act for reviews is the Canadian Environmental Assessment Act, but the Canadian Environmental Protection Act and the Fisheries Act can provide the federal government with the power to conduct a review. Other acts can also trigger a federal review. Assessments of environmental impacts are a necessary and accepted part of project design in the industry. However delays and uncertainty can lengthen an already time consuming and expensive process and exacerbate the cost position of mining operations unnecessarily.

TABLE 3
ENVIRONMENTAL PRESSURES IN MINING

Environmental Pressure	Concerns
Reclamation of Site	<ul style="list-style-type: none"> • Hazards of tailing ponds and waste materials • Land reclamation subject to strict regulation • Reclamation funds required before opening of mine site
Water Quality	<ul style="list-style-type: none"> • Drainage of acid from tailings • Pollution of water during mining and acid mine drainage • Particularly difficult to stop seepage of toxics in water <i>after</i> closure of mine
Toxic Waste	<ul style="list-style-type: none"> • Pressure to improve handling of government listed toxic substances • Restrictions on movement of hazardous wastes
Air Quality	<ul style="list-style-type: none"> • Sulphur dioxide emissions as a source of acid rain • Carbon dioxide resulting from burning of fossil fuels • New technologies developed to control these emissions
Health and Safety	<ul style="list-style-type: none"> • Mine safety and working conditions an important concern • Processing operations involve substances that can be a danger to the health of workers and to the environment of communities
Land Access & Mineral Tenure	<ul style="list-style-type: none"> • Protection of wilderness areas and growth of park areas • Withdrawal of possible mining lands from production
Energy Conservation	<ul style="list-style-type: none"> • Significant user of energy • Greater energy efficiency lowers cost and environmental harm
Environmental Impact Assessments (EIAs)	<ul style="list-style-type: none"> • Critical public policy issue • Process criticised as complex, long and uncertain • Large set up costs of a mine means EIAs can have large cost implications and adverse consequences for investment • Shared provincial and federal jurisdiction

Whitehorse Mining Initiative (WMI)

Faced with these types of pressures it was clear that a number of different groups had an important stake in the mining industry and its activities. To resolve many of the issues, a different process was needed to develop a long term strategy.

Following a proposal from the mining industry, the mining ministers of Canada agreed to co-sponsor a multi-stakeholder process which became known as the Whitehorse Mining Initiative (WMI). Representatives of five groups with a key interest in mining were invited to participate in the WMI. These were the mining industry, federal and provincial governments, labour unions, Native peoples and environmental groups.

Discussions to develop a long term strategy to address the issues facing the industry began in February 1993. A Leadership Council to provide direction and accountability was established. It was composed of all the mine ministers in Canada and top officials from mining companies, Native organisations, labour unions and environmental organizations. Four issue groups were set up to define and address the key issues of finance/taxation; environment; land access; and workplace, workforce and community. Each issue group produced a set of principles and objectives and together made over 150 recommendations.

The four reports from the Issue Groups were then used to draw up the Leadership Accord which establishes principles and goals to be pursued. Equally important was a statement of intention to follow-up action and monitoring of implementation of the Accord. The Accord was signed and adopted in September 1994 and is intended to address all the major challenges that were felt to be facing the industry. The Accord thus represented an overall plan to renew the Canadian mining sector.

Within its strategic vision for the mining industry the Accord recognises the importance of the following key steps:

- preservation of healthy and diverse eco-systems in Canada;
- the participation of Natives in all aspects of mining and the sharing of its opportunities with Native peoples;
- improvement of the investment climate for mining investors;
- streamlining and harmonization of tax and regulatory regimes, especially environmental processes;
- adoption of sound environmental practices;
- establishment of an ecologically based system of protected land areas;
- provision of safe and healthy working environment for mining workers;
- respect for Native treaty rights;
- settlement of Native land claims;
- guarantee of full participation of stakeholders in public interest questions; and

- creation of a climate for innovative and effective responses to change.

Many of these steps represent significant progress in areas of principle. In terms of protecting the environment, concern over mining activities was addressed in three areas:

- minimising the environmental impacts of exploration;
- ensuring that for sites in operation, environmental protection and economic viability are achieved; and
- proper rehabilitation of inactive mines.

The Accord recognises the need for more prudent exploration, better mining design, and comprehensive risk management systems in addressing these problems. The Accord also explicitly recognises the usefulness of environmental impact assessments. However, it believes that these assessment processes can be improved through a more integrated approach with both land use planning and government policies. Furthermore, the assessment process could be improved through a more formal and representative structure, and by defining the ecologically important scope of the assessments in the early stages of the assessments.

In reference to land use, the major criticism was that land access decisions have not provided enough certainty to all the stakeholders in mining. Often there is no regional land use plan. Improving the policy on land use and land access is critical for the mining industry. The Accord calls for a more accessible process for all stakeholders, and for collaborative mechanisms to be established outside the land access process to address difficult issues that could complicate the process of granting permits.

The principles on land use and environmental protection and assessments embodied in the Accord have many implications for human resources. The Accord also addresses specific human resource concerns such as how to attract and retain a skilled and adaptable workforce that can take advantage of the modern mining technology. It is recognised that the success of the mining industry depends in large part on the availability of such a workforce. The Accord calls for improved access to training for both workers in the industry and those currently outside mining, improved mobility of workers employed in the industry, and the enhanced equity of employment opportunities for groups which have traditionally been under-represented in mining. In addition, the importance of proper health and safety standards is recognised. Standards should give priority to ensuring protection for workers in cases of uncertainty or disagreement. Furthermore, the regulatory framework should be developed in consultation with business and labour.

The importance of the WMI is hard to over-estimate in an industry that has traditionally faced conflicts and adversarial relationships between the major stakeholders. It is an important step in that there is explicit agreement recognising the value of integrating economic, environmental and social factors into a cohesive strategy for the mining industry. Finally, like the BC Forest Renewal Plan, these principles were worked out by the stakeholders themselves, who still retain control over the process.

Other Initiatives

Accelerated Reduction/Elimination of Toxics (ARET)

The ARET is a multi-stakeholder initiative that seeks to assess the validity of voluntary approaches to achieving environmental goals. Members of the group are drawn from industry, health and academic institutions and federal and provincial governments. The group grew out of a report to the Minister of the Environment in 1991 that set out a process to deal with toxic substances.

A main task of ARET is to develop a list of toxic substances for reduction or elimination. The group is particularly concerned about emissions of these substances. This list is developed with two technical sub-committees using both good scientific knowledge and sensible inference. The list is based upon the consensus among the various stakeholders of the main ARET group. The ARET group is therefore an initiative that focuses on specific target substances and seeks to encourage industries to voluntarily reduce their emissions of these substances.

The list of toxic substances is applicable to many industries, among them the mining industry and the chemical industry. Thirteen mining companies representing 83 percent of base metal production in Canada have pledged to reduce the discharge of 12 major substances by 71 percent from the 1988 level by the year 2000. Their first emissions report, *Voluntary Emissions Reduction*, indicates that emissions had been reduced by 43 percent overall by 1993.

Chemicals

The chemical industry is the third largest manufacturing group and one of the fastest growing sectors of the Canadian economy over the last two decades. The industry is, however, highly capital intensive and as a result employs relatively few workers — just over 100,000. The majority of the chemical firms are large foreign owned multinationals based mostly in the U.S. As a result, the industry is highly integrated on a continental basis. Significant volumes of trade flows between Canada and the U.S. especially between parent companies and their affiliates. The industry, like mining and forestry and forest products, is a cyclical one and is affected by the general level of economic activity. After several years of weak prices, 1994 and 1995 were years of rising prices, sales and net earnings.

The restructuring that was forced on the industry in the early 1990s was motivated by a desire to reduce costs. These remain a continual point of competition for two reasons. First, the Canada-US Free Trade Agreement is phasing out the previously high tariffs and will lead to greater exposure to competition from chemical plants south of the border. At the same time, lower tariffs are leading to greater integration of the North American market. Parent companies are thus striving to increase production efficiencies and reduce costs by consolidating operations. This means existing Canadian operations will face greater competition for investment dollars and the right to produce certain chemical products.

Environmental Pressures

The manufacture of chemicals involves substances that can be harmful to the environment. These substances can pose dangers to the community through waste emissions and accidents and also to workers in their use and handling. The nature of these risks and environmental pressures in the chemical sector are described in Table 4.

One of the greatest pressures the chemical industry has faced is that of public perception that chemicals are dangerous substances. Coupled with the fact that information about the effects of exposure to chemical substances is the preserve of the scientifically knowledgeable, the industry has been perceived as elitist in its approach to public concerns. The Bhopal disaster in India in 1984 merely served to confirm this view by the public. Since the Bhopal disaster the industry has made great effort to address this situation as the Responsible Care case seeks to show. In view of the growing concern over the health risks of certain substances such as CFCs, the Canadian Environmental Protection Act (CEPA) has targeted a number of substances for review towards sunsetting or reduction in use. Eliminating high risk chemicals has pushed the search for environmentally better alternatives. This represents an opportunity for innovation by Canadian chemical producers. One concern that is felt in the industry, however, is that the new substance verification process under CEPA is slow and complex and can hinder Canadian development of new chemicals.

The control of waste emissions to air and water is a continual pressure on the sector and arises out of the very nature of the production process. The chemical process uses large quantities of water. Proper treatment of this water before discharge is important in improving the environment. Efforts to clean up large bodies of water such as the Great Lakes and the St. Lawrence have been ongoing and have involved governments, communities and environmental groups in a concerted effort. With air emissions such as NO_x and VOC which create ground level ozone and contribute to urban smog, ongoing efforts have been targeted towards collection and treatment of toxic compounds before they are released into the atmosphere, often using newly developed technologies. It is worth noting that the age of a capital intensive site such as a chemical plant is likely to have an important bearing on how effectively water and air emissions can be reduced or cleaned.

TABLE 4
ENVIRONMENTAL PRESSURES IN CHEMICALS

Environmental Pressure	Concerns
Public Opinion	<ul style="list-style-type: none"> • Chemicals viewed as dangerous substances • Risk of accidents as illustrated by Bhopal disaster • Growing demands for environmentally friendly products (e.g. chlorine & phosphate free)
Sunsetting Initiatives	<ul style="list-style-type: none"> • CEPA targeted number of substances for reduction or elimination because of their health risks • Need for sound scientific information
Approval Process	<ul style="list-style-type: none"> • Process of approving new chemicals perceived as lengthy and complex, causing cancellation or costly delays in production
Water Quality	<ul style="list-style-type: none"> • Discharge of contaminated waste water a serious concern (e.g. Great Lakes) • Considerable progress made to date
Toxic waste	<ul style="list-style-type: none"> • Agreed to virtual elimination at source of toxic discharges through treatment and disposal • Problem for exporter to dispose of toxic waste
Air Quality	<ul style="list-style-type: none"> • NO_x and VOCs create ground level ozone and contribute to smog • Ongoing efforts to reduce NO_x and VOC emissions meeting targets
Health and Safety	<ul style="list-style-type: none"> • Exposure to toxic chemicals raises concerns for workers long term health • Exposure through accidents also a concern for workers and communities

Notes

CEPA Canadian Environmental Protection Act

NO_x Nitrogen Oxide

VOC Volatile organic compounds

For workers good environmental practice begins in the workplace since it has an effect on health. Producing and handling of toxic chemicals raise concerns for workers as to the long-term health hazards of exposure to certain chemical compounds. Furthermore, accidents in the use or disposal of these chemicals can pose immediate dangers to workers' safety. Workers are becoming increasingly involved in identifying environmental hazards and in accident prevention. This often requires specialised training. The Workplace Hazardous Materials Information System is an example of a joint initiative aimed at informing workers about hazardous materials in their workplace.

Responsible Care

The Responsible Care Program was developed by the Canadian Chemical Producers' Association (CCPA) mainly in response to the adverse public perception of chemicals and the chemical industry. The initiative committed chemical producers to a wide ranging set of principles regarding chemical products and chemical processes. The commitment was made to undertake every practical caution to minimise the adverse effect on human health and the environment during all the phases of chemical operations, from development to disposal of the chemical substance. Membership in the CCPA is contingent upon acceptance of the Responsible Care principles.

To make this policy effective, codes of practice were developed by the CCPA through a National Advisory Panel. The panel is composed of industry, community, academic and environmental representatives. The role of the panel is to provide input to the development of performance measurements and to conduct public verification of the Responsible Care initiative. The codes cover the life cycle of the chemicals.

- *Research and development code.* This involves the identification of potential health and environmental hazards of new chemicals, what their end uses are and how to deal with hazards and abuses of new products.
- *Community awareness and emergency response (CAER) code.* This code requires firms to solicit concerns from and provide information to the local community in order to raise community awareness across a broad range of issues as part of a community right-to-know policy. In addition, development and testing a co-operative plan for dealing with emergencies is also required under the code.
- *Manufacturing codes.* These provide for risk evaluation and control of manufacturing along with awareness of and attempts to minimise wastes and emissions. Proper documentation of procedures and the recognition of training needs are included. The code commits companies to design production processes to achieve minimum risks.
- *Transportation code.* This commits to assessment of carriers, modes of transport, routes and the types of procedures followed with the aim of minimising the risk of accidents.
- *Distribution code.* This code provides for an assessment of customers, suppliers, distributors and contractors of chemical products to ensure that

the risk of environmental impact from use of chemicals is minimised. Essentially this is a recognition of the concept of product stewardship by the chemical industry.

- *Hazardous wastes codes.* The code includes the reduction, reuse and recycling of wastes, an assessment of contractors and a knowledge of historical practices.

To ensure commitment to Responsible Care codes, CCPA produces three reports. Employee safety is monitored as part of a safety health and accident reporting experience (SHARE) initiative, the results of which are publicly available. Reductions in emissions are monitored by yearly public reports. Finally a transport incidents report is also produced.

In being part of Responsible Care the CEOs of the participating chemical companies certify in writing their compliance with the codes and are verified against that commitment. Some sixty-nine companies were full participants in the program by the end of 1995. While approval by company leaders is a critical initiation of the Responsible Care program, one of the challenges facing the implementation of the codes is the ability to drive changes down to the local level. Education, training and effective communication are important in helping to achieve the application of the Responsible Care codes at the working level.

Emission reporting covers toxic substances, smog contributors, ozone depletants, water emissions and greenhouse gases. The annual Reducing Emissions reports from the CCPA shows that among CCPA reporting companies, total emissions from facilities in 1994 were 50 percent less than in 1992 despite improved economic performance and higher production among the reporting companies. It was also indicated that emissions had declined significantly for known and possible carcinogens VOC and NO_x, CFCs and heavy metals into water. However, greenhouse gas emissions had risen by 5 percent between 1992 and 1994.

Responsible Care is an example of a voluntary initiative in the management of the environment. The catalyst for this shift in cultural style by the chemical industry was the growing public mistrust of the chemical industry and a series of environmental accidents. The possibility of further environmental regulation may also have been a factor. This initiative was originally conceived by industry and developed through a consultative process that included unions. The program is included in the current study because it does represent a break with traditional management styles. It has also been adopted as a model for chemical industries in many countries around the world. Responsible Care thus represents a significant response to environmental pressures.

Other Initiatives

The chemical industry has links to other multi-stakeholder initiatives to address environmental and sustainable development concerns. Examples of such initiatives are the ARET program described above and the Major Industrial Accidents Council of Canada (MIACC). The latter is a group traversing various industries and includes

governments and emergency responders that seek to improve the preparedness of communities in responding to accidents involving hazardous substances. Both the ARET and MIACC are examples of voluntary co-operation, principally between industry and government around specific environmental objectives.

Lessons from the Sectoral Initiatives

The sectoral initiatives point to a number of lessons which appear to be common to their respective approaches. While the concern in this report has been with those sectors with current heavy environmental responsibilities, the lessons learned are also applicable to other sectors, particularly those which may face environmental pressures in the future as shifts in the environmental agenda and sources of environmental concern change.

Long term focus

All the sectoral initiatives address long term problems facing the sectors. The processes identified above lay the groundwork for considering planning and decision making on important determinants of long run economic and environmental objectives. To accomplish this, the initiatives have established mechanisms that provide for continuing dialogue, discussion and assessment rather than “a one-off solution.” The nature of the adjustments to environmental change vary between the sectors, but they all attempt to incorporate adjustment into sectoral strategies.

Full discussion among all affected parties

The processes all contain a wide inclusion of discussants: business, labour, environmentalists, community groups and aboriginals (though unions were absent from the Responsible Care initiative). As a result, the sectoral approaches have been able to develop an integrated set of values — economic, social and environmental — to often complex and inter-linked issues. In the resource sector it is indeed remarkable that such multi-partite bodies were able to reach consensus on what have been contentious issues in those sectors.

Improvement of Resource Base

Both the FRP and the WMI recognise the fundamental importance of the resource base for the sustainability of the sector overall. Questions of improving the resource base can only be dealt with effectively and equitably through a sectoral approach, since changes affect all participants in the sector. Thus, a sectoral approach and development of long term plans can be important ingredients to developing a sustainable resource that will provide for the future health of the sector. At the same time, the process of developing consensual approaches in a sector permits full participation and consultation of the various interested parties.

New role of government

The sectoral initiatives also provide interesting models of the role of government in adjustment to environmental concerns. In both the WMI and the FRP the government role has been one of a broker in bringing together a wide range of interested groups to discuss and, more importantly, to resolve critical issues. This is in contrast with the

traditional role of providing assistance programs to industry. This indicates that government does not necessarily have to be the assistant of last resort. Such a role for government would seem to use government revenue in a more efficient manner to deal with environmental and adjustment issues in a sector. In the chemical sector the government's role has been less active and interventionist.

Innovative adjustment responses tailored to sectoral structure

The initiatives have developed strategic plans and codes of practice that have been developed by interested parties. These same parties monitor progress on the various initiatives. This essential reliance upon an internal solution to the environmental and economic issues in these sectors represents an innovative approach designed to accommodate the particular characteristics of the sector.

Training an important area in adjustment

In all three initiatives the importance of adequately and appropriately trained human resources is recognised. Training will continue to be a key area of adjustment responses to environmental concerns as each sector adopts new technologies and practices.

The general conclusion from this review is that sectoral approaches are an essential component for dealing with adjustment. A common approach can be developed for a sector that still allows flexibility in individual workplaces. Sectoral approaches can provide workforces with the support they require to make the transition from job losses to areas of opportunity. Because sectoral approaches are more permanent, long term programs and support mechanisms can be developed that can anticipate problems of adjustment. Such programs include the elements of training, counselling, use of industry experts, job data banks and other programs. Such initiatives are essential to facilitating smooth adjustments to environmental change.

IV THE WORKPLACE CASE STUDIES IN SUMMARY

The case studies undertaken for this project attempt to show the diversity of responses to environmental change at the workplace level. They are particularly valuable in that they provide hands-on experience which can be used to draw some useful lessons for both business and labour, as well as to inform public policy discussions. The complete workplace and sector case studies are detailed in a background report, available upon request.

The workplace cases, like the sectoral initiatives, examine constructive and joint processes between business and labour that have been developed to handle different particular circumstances. Many of the workplace examples also involve community and environmental stakeholders, in addition to business and labour.

It is important to note that the particular nature of the challenge the workplace or sector faced was not always the same. Howe Sound Pulp and Paper, for instance, illustrated an aging facility threatened by high costs and poor environmental compliance. The solution was to accomplish a sweeping modernisation including environmental upgrades and installations. Bayer faced continuing cost pressures among which the environment is a significant one. This led to a series of different incremental adjustments which have affected employment levels at the Sarnia plant. Uniroyal Chemical, on the other hand, was faced with a particular environmental problem — NDMA in its waste water — which led to the shutdown of two production lines and consequent impact on employment levels. At Brunswick Mining and Smelting there were concerns over prolonged exposures to heavy metal dusts in the plant. InterFor's problem was to rationalise production among its mills in the face of a limited timber supply. Finally, the Quintette coal operation confronted a number of local environmental pressures such as response to spills, leakages and storage of wastes. At Highland Valley Copper near Logan Lake B.C. the company faced high costs of both worker injury and wastage of supplies while the union had incurred a \$250,000 legal bill. Through an innovative joint approach, both sides were able to address and improve their positions on these issues.

From such a rich variety of issues the cases examine how the key players attempted to deal with the adjustments that were necessary and the various areas where action can be taken. These issues have been grouped into five areas:

1. Changing technologies and practices in the workplace;
2. Training for human resources;
3. Protection for affected workers.;
4. Changing product lines;
5. Community involvement.

Grouping the case studies in this way aims to draw out common elements of the workplace cases.

1. Changing Technologies and Practices in the Workplace

All the workplace cases have involved substantial changes in production technologies, accompanied with changes in practices. There is a rich variety, however, in the types of change that have been implemented in the workplace. In some cases, such as Howe Sound Pulp and Paper, the changes have been wholesale. At the other extreme, beneficial adjustments have been made using very little introduction of new equipment. Instead, work practices have provided low-tech solutions that benefit the environment. An important point is, however, that these changes have been accomplished through joint discussions between business and labour.

Investments in Equipment

The \$1.3 billion modernisation at Howe Sound Pulp and Paper in Port Mellon took two years and was a joint venture between Canfor and Oji, the Japanese paper giant. Without this modernisation the future of the facility and its workers was at best uncertain, since it faced mounting environmental pressure, uneconomic operations, aging equipment and dependence on a single product. Moreover, Canfor had insufficient capital for modernisation. Undertaking the modernisation allowed the introduction of new environmental technologies totalling \$116 million. These included *(i)* replacement of the three old recovery boilers by a single low odour machine which would reduce smoke particles by 80 percent and hydrogen sulphide by 70 percent; *(ii)* introduction of a two stage oxygen delignification technology to eliminate dioxins and unwanted chlorinated organic compounds; when combined with six washing stages, the level of chlorine use was greatly reduced; and *(iii)* incorporation of an advanced biological treatment system — the UNOX — as a secondary treatment facility.²⁵ In addition, a wood residue co-generation, which was designed to produce 70 percent of the mill's electricity requirements, was installed for a further \$150 million.

At the Bayer plant in Sarnia, the age of the facility was also an important factor in problems of quality of water discharges at the five discharge sites and accidental spills into the St. Clair river. In response, the company spent up to \$40 million between 1991 and 1994 on environmental measures and equipment including a sludge treatment facility, development of a closed loop cooling system together with a benzene containment unit, and outfall analysers.

At Uniroyal Chemical, the response to the presence of a possible carcinogen in waste water was to develop and introduce new production processes that used significantly less water. An advanced oxidation process was introduced to supplement its water pre-treatment to destroy any NDMA already existing in waste water.

Changing Practices

Responses to environmental problems are not simply dependent on introducing new technologies. It is equally important that practices within the workplace be modified or

changed significantly to achieve better environmental performance. In order to achieve this, involvement of workers through their respective unions can provide necessary co-operation and working knowledge. A striking example is the Uniroyal case where changing some simple practices (such as cleaning floors by sweeping them rather than hosing them down) were effective in reducing water use and discharges. Multiple uses of water for cooling, rather than using cooling water only once before discharging it into the river, also contributed significantly to lower water discharges.

Over and above these reasonably simple changes, Uniroyal's approach to its problems with waste water and the resulting shutdowns was to establish internal environmental guidelines. These were to reduce the use of water from 1.2 million gallons per day to 400,000 gallons per day and to reduce water discharges from 150,000 to 40,000 gallons per day. Along with the new production processes developed to use less water, these guidelines addressed what was produced and how was it produced. In essence, the crisis prompted the company to reinvent itself.

In many cases, practices have been changed through joint environmental committees which mirror the structure and process of joint workplace health and safety committees. It is encouraging that these committees continue to flourish and were present in the workplace cases. Expansion of the health and safety committee specifically to include the environment was part of the collective bargaining process at the Quintette coal operation. This joint committee has been instrumental in communicating a number of procedures to its large workforce, e.g. on spill response and waste storage, which have greatly reduced the number of reputable spills at the site. The joint process has also served to improve communications and trust between the union and management.

At Howe Sound Pulp and Paper, the local union has been involved in the various environmental committees at the work site and has helped to improve the environmental safety and performance in the facility. At Bayer, a joint business-labour environment committee was established in 1990 and has been very active in improving environmental performance of the facility. Originally the committee met on a monthly basis, reflecting the priority of its work; but now it formally meets quarterly, although the management and union co-chairs continue to get together informally on a weekly basis.

At other times, a point of crisis has served to galvanise both labour and management into improving environmental practice, though this is not necessarily the least painful course to take. At Uniroyal, the unanticipated discovery of NDMA served to raise the awareness of workers and management on production methods and the environment. Both parties have met regularly to discuss and review environmental performance.

At Brunswick Mining and Smelting, a long strike served to underscore the problem of communications between union and management and prompted both sides to seek a mechanism to address their concerns. That mechanism was the joint health and safety committee, which became instrumental in addressing health concerns through improved working practices at the plant.

The Highland Valley Copper case provides an example not only of innovative measures, but also how environmental concerns can be integrated into other issue areas through joint problem solving. Initially, Local 7619 of the United Steelworkers of America faced

a court judgement against it of \$250,000 in the late 1980s, an amount that would be difficult to raise through normal dues. The union also knew that large amounts were spent by the company on equipment that was discarded before it was necessary to do so. The company continued to deal with workers whose injuries kept them away from work — even if their injuries were not extensive enough to prevent them from some lighter duty work — which had a subsequent impact on premiums for Worker's Compensation and other wage indemnity programs.

As a result of discussion between the union and management, a Modified Work Centre was established where injured workers who were independently judged capable, undertook light duty tasks such as cleaning and refurbishing mining supplies. The savings produced by this work have been offset against the union's court judgement. The Modified Work Centre has provided an opportunity for on-site rehabilitation while engaging in the environmentally beneficial activities of reusing and recycling supplies. An additional benefit has been that workers have been able to maintain links with the workplace that enable them to make a significant contribution, and have access to the important social interaction of a work site.

2. Training for Human Resources

All the case studies have involved training to enhance the skills of the human resources in the workplace. Often this has been necessitated by significant changes in technology and practices adopted in the workplace. At Howe Sound Pulp and Paper, for instance, the nature of the work changed significantly following modernisation and introduction of a new newsprint division. These adjustments to new job tasks inevitably required substantial investments in retraining and upgrading of skills, particularly computer skills. An \$11.5 million training program (excluding the wage cost) was implemented and some papermakers were sent for training at a high speed newsprint mill in Japan. Paradoxically, the inexperience of Port Mellon workers in newsprint production was viewed favourably by Oji, since the training would not involve unlearning previous techniques and habits.

Training was decentralised, done by each department but with input from the union and workers. In general the union (Communications, Energy and Paperworkers Local 1119) became more involved as the process developed. Certain practices have been eliminated as a result of this workplace change. The management side has been reorganised in order to improve productivity, which was achieved through a team approach with union and employee involvement.

Similar training needs, particularly in computerisation, were required at Uniroyal where, as a result of the newly developed production process and changing practices, a strong commitment to training was fostered. In addition, the Chemical Operator Apprenticeship program was developed and instituted at the Elmira plant. This has proved successful and was formally recognised by the Ontario Ministry of Skills Development.

Because of the important environmental component in all of these cases, significant training on operating the new equipment was necessary. Over and above such training, however, was the need to provide training that would enhance worker awareness of

environmental responsibility. Such environmental awareness training was provided to workers at the Bayer Rubber plant to encourage better practices in the workplace in relation to the environment. A four year apprenticeship program using instructors from nearby Lambton College was developed for a control systems technician. These education costs, including the wage cost, are considerable, but the both company and union believe that it will provide for a better adapted and more productive workforce.

At InterFor, training was an integral part of the discussions with the IWA concerning innovative ways to reduce layoffs. Some jobs were created through training of the whole workforce on fibre recovery techniques. Additional apprenticeships also helped to reduce the impact of mill closures and reductions. Providing opportunities for training and training relief provided for a smoother transition to new operations rather than reducing the workforce to its bare minimum.

Training in environmental awareness and responsibility was provided internally at the Quintette coal operation by the environmental co-ordinator. This arrangement reflects the remote location of the operation.

Over and above these workplace training programs, the issue of training is primarily one that goes beyond the single workplace, given the economies of scale available from a common initiative rather than a piecemeal workplace approach. Sector approaches to training were discussed in the previous section, where all sectoral initiatives include training as a critical activity.

3. Protection for Affected Workers

Change, whatever its source, inevitably causes both adverse and beneficial impacts. A key concern is to ensure that the costs of change are minimised and that displaced workers are provided with some choices. The case at InterFor demonstrates that innovative ways of minimising layoffs can be accomplished through a joint approach. In all, 652 workers were affected by restructuring plans at four mills, caused by concerns over the timber supply to these mills. The initial plan for 200 layoffs was reduced to about 40 without affecting the cost structure of the operation through a variety of means — different investment plans, training opportunities, environmental activities, early retirement and definitional changes. Joint methods of dealing with environmental change were thus successful in minimising the burden of change and of spreading the cost of change more evenly.

Sudden and unanticipated changes in environmental and economic factors can cause severe job dislocation in the immediate term. Such changes also make it difficult to accommodate the concerns of both business and labour because of the short time frame and lack of preparation. The Uniroyal example is a case in point.

The effect of Ontario Ministry of Environment orders to the company was the shutdown of two processes in the plant; as a result, total employment fell from 280 to 160. Not surprisingly, the union membership voiced the need for some formal protection in the collective agreement with respect to sudden adjustments to environmental change. Negotiating an adjustment package was extremely difficult in the circumstances and

workers managed to get only recall rights and pay in lieu of notice. It was mainly due to the desire of both union and management to avoid such a crisis again that steps were taken to improve the environmental performance of the organisation and therefore to reduce the vulnerability of workers and the company to such external events in the future. In a case such as Uniroyal and others like it, a sectoral adjustment approach similar to that of CSTECH would have provided more support for displaced workers.

Adjustments are also more difficult for certain groups of workers, especially older workers with little formal education. At Howe Sound Pulp and Paper the process of change was stressful for older workers, many of whom had 10 or more years of seniority. Early retirement packages for older workers (55 and over) were offered.

By contrast, in 1993 Dow, Bayer and Nova undertook a joint venture to reduce both energy costs and NOx emissions through the production of steam by co-generation. Nova would purchase energy produced by Dow and Bayer. However, because of the vintage of the equipment at Bayer, the major labour impact of the co-generation deal was felt at this facility where three old boilers were closed down and workers affected. The company and the union then negotiated a package to avoid layoffs through shifting workers to other positions at the plant. This included not only an agreement on pay classifications but also a bonus to affected workers if they stayed at the power plant until the boilers closed down. With proper planning Bayer and the CEP local were able to develop a customised solution to the workers affected by a joint venture. The benefits of increased energy efficiency thus provided the source of compensation to the displaced workers.

Indeed, it is worth noting that employment levels have fallen in the previous decade at the Sarnia facility through attrition and periodic adjustments. In each of these adjustments the company and the union have negotiated an adjustment package that reflected the particular circumstances and included a number of different provisions on voluntary severance, early retirement, no layoffs and flexibility on trade classification. It is interesting to note that even in times of continual pressure to reduce costs, proper adjustment packages are still possible in some workplaces.

Workplace adjustment packages can be negotiated at the workplace level but a more effective and equitable solution is a sectoral approach to adjustment for displaced workers. This was discussed in the previous section.

4. Changing Product Lines

Most of the responses of the cases were related to initiatives in the workplace and production. However, there was recognition of changing customer preferences regarding the environmental impact of certain products. Companies that do not reflect this change in customers demands will not remain in business for long. In some of the cases changes were made in the characteristics of the products, or entirely new products were produced. This can have beneficial effects on the environment in production.

The modernisation at Howe Sound Pulp and Paper allowed the company to add to the types of products it produced. The Japanese quality standards for newsprint are the highest in the world and the facility at Howe Sound is one of the very few producers

outside Japan that has the equipment and manpower to meet these standards. The company also became one of the world's few producers of totally chlorine free (TCF) bleached kraft market pulp in 1991, although this is currently a small part of its total pulp production.

At Uniroyal, one of the responses to the crisis was to switch to producing anti-oxidants for motor oils. These products require less water in manufacture and thus would lower water demands and water discharges and improve the environmental performance of the company. The Responsible Care program in the chemical industry also includes codes of practice on research on the identification of potential health and environmental hazards of new chemicals and how to deal with them. The intention is to produce substitutes for chemical products that will reduce the environmental and health risks. Many chemical companies have agreed to these provisions.

5. Community Relations

An integral part of any environmental strategy by companies and unions must be to foster trust within the community in which it resides. An important prerequisite for this confidence is dissemination of information and opportunities for involvement by community groups in discussions over environmental issues. Workers and management are also members of the local community and have a similar interest in the environmental quality of life.

At the workplace level, community advisory panels have been established that allow for an exchange of information and discussion of environmental questions including air and water monitoring, notification of accidents and spills, and remedial measures. Typically these community panels are composed of community, environmental, company and, where appropriate, Native representatives. In Sarnia, Bayer representatives sit on such a panel which provides discussion of the affected parts of the St. Clair river system. Advice has also been provided by company personnel on water treatment in local municipalities. The result has been a two way street: a better appreciation by company representatives of local concerns, particularly regarding water quality, and a greater degree of trust and comfort among local residents and farmers.

In Elmira, the whole process of removing NDMA from the Uniroyal waste water as well as the extensive environmental cleanup was monitored by a public advisory committee composed of representatives from the local community, the Grand River Conservation Authority, and regional and municipal governments, and included two representatives from local environmental groups. Information packages to inform residents of conditions at the Uniroyal facility including emissions are regularly produced. Contact with the local community is an integral component of the Responsible Care program of which Uniroyal is a signatory. There are regular surveys of local residents on a wide range of environmental matters from noise and traffic congestion to safety concerns and odours, as well a standing emergency response team to deal with potential accidents emanating from the Elmira facility.

In locations where local communities are remote or very small, other solutions have been developed. Brunswick Mining and Smelting has established a telephone complaints

system accessible to the public. This allows the company to deal with particular environmental issues in an expeditious manner. At Quintette coal in Tumbler Ridge, B.C. the community and company are closely linked through less formal means that allow information and advice to flow between the facility and the community. The total dependence of the community on coal and the remoteness of the location seem to be important factors in this.

These represent many of the common elements of the workplace case studies. Together with the lessons from the sectoral initiatives a number of conclusions and recommendations can be drawn.

V CONCLUSIONS AND RECOMMENDATIONS

The evidence presented in this report demonstrates that environmental concerns are increasingly affecting the activities of both labour and business. This trend can be expected to continue given the expanding scope of environmental concerns and the different sources of these concerns as described in section II.

Environmentalism and sustainability concerns are moving issues further back up the production process with a greater emphasis on pollution prevention rather than end-of-pipe solutions to environmental problems. Greater concern with environmental performance of suppliers and distributors is also evident. Product stewardship and ensuring the environmental integrity of products and production processes is also being driven by the various initiatives on management standards such as the ISO 14000 series and others. Demands by consumers are pushing environmental responses from companies in terms of their practices and products. Concern over appropriate land uses as well as community concerns over the state of the environment and worker concerns over health in the workplace are further adding to the pressures on business and labour.

The case studies described in sections III and IV make it clear that environmental performance can be improved and can provide opportunities for improving productivity. They also demonstrate that an integrated approach is both preferable and possible. Environmental and sustainability concerns are not merely add-ons that are separate from other economic preoccupations. They are an integral component of the ways companies and unions are responding to the confluence of changes they face. At the same time any change can have adverse impacts. For instance, jobs can be adversely affected by environmental pressures at the same time as opportunities are created through other areas. The precise magnitude of these impacts will vary but the case studies clearly show that the impact on jobs is an important element of adjustment to environmental change.

The challenge which the recommendations address in this section is to manage the improvement of environmental performance in such a way as to place companies and workers on a more long term sustainable basis. Opportunities for improvements in productivity and employment growth need to be exploited while the adverse consequences of such change need to be minimised. The recommendations thus attempt to address this challenge. They are organised into recommendations concerning workplace issues, sector issues, community issues and the role of government. This does not mean recommendations do not have implications at other levels.

Workplace Issues

The workplace is the basic block of an industrial society. It is the place where change occurs at its most fundamental level. The workplace case studies display a diversity of responses to environmental concerns from which a number of lessons and recommendations can be drawn.

Joint Processes & Information Exchange

In terms of process the most important recommendation at the workplace level is that some mechanism exist to share information and discuss responses to environmental pressures. Workers possess knowledge that is important in suggesting changes in practices that would be more environmentally responsible. Such knowledge is also useful in discussion with management over how to implement more fundamental changes. Management should therefore have the benefit of this particular expertise.

Health is one of the key issues where information flow is critical. To improve dialogue, trust and co-operation workers require full information of the environmental impact of certain production processes and toxic substances. It is important that information available to workers and managers be based upon sound scientific evidence. However, a joint process should be flexible enough to allow for the adoption of the precautionary principle, as specified in the UN Commission on Environment and Development (see Recommendation # 2), in special cases where the risks of exposure to a substance are serious or irreversible but full scientific evidence is currently unavailable. The precautionary principle precludes the curtailment of industrial activity merely on the grounds that there are some unknown effects. The purpose of information laid before business and labour is to help improve their ability to minimize the risk of industrial activity.

Access to information on occupational health and safety has often been coupled with the right to shutdown production. Such a situation is an extreme one. An alternative is the provision of full access, with a joint mechanism to involve affected workers in decisions to improve the working environment and health based upon available information and to resolve issues without recourse to simple closure of production.

In the case studies the provision of joint business labour mechanisms, such as environmental committees, were critical in sharing and discussing information. Joint discussions also provided opportunities to anticipate potential problem areas. Environmental committees are often an extension of health and safety committee structures to include environmental issues that affect the workplace including public perceptions of the environmental practices. Although all provincial jurisdictions have legal requirements for joint workplace health and safety committees, this is not true in the case of environmental committees.

In some of the case studies concern was expressed about the long term effects of exposure to various toxic substances, particularly in previous years when practices were less sensitive to the environment. The legacy of past exposure levels has led to negotiation of clauses in some collective agreements that limit the exposure of workers to toxic substances over their entire working life time.

Recommendation #1

We recommend that business and labour enhance existing processes to address environmental issues and impacts and devise effective solutions to environmental concerns. Sufficient information should be made available to the joint process for this purpose. The issues to be addressed include:

- i) *the environmental risks and impacts of handling certain substances in the workplace;*
- ii) *the environmental risks and consequences of certain workplace practices;*
- iii) *more environmentally benign workplace practices that can be accomplished without large capital investments; and*
- iv) *limitations on the exposure of workers to toxic substances over their working life.*

Recommendation #2

We recommend that the information placed before the joint business labour process should be as much as possible based upon sound scientific data. The joint process will attempt to minimize the risk of industrial activity given the best ability to do so through the proper use of the precautionary principle: where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation.

Periodic adjustment

Where more fundamental changes of a one-time nature are undertaken the joint process established would prove useful in allowing an ongoing dialogue between management and labour prior to full negotiations with management representatives and union leaders.

Part of the value of joint business labour approaches would be the provision of information on the impacts of periodic change, particularly any impact on jobs. The jobs issue is a perennial concern for workers and can be the source of much fear of change. A more co-operative approach to change, supported by full information, would thus build greater trust between the two parties, reducing the resistance to change and increasing the willingness to discuss significant and innovative responses to environmental pressures. Such measures could include changes in production technology and how it could be organised, and workplace practices and training. It is important that, where possible, such measures be put in place to give sufficient time for a proper discussion of the concerns.

The case studies have also demonstrated that proper negotiation of such issues as severance pay and early retirement provisions have enabled adjustment to be made more easily from the point of view of the worker and the effect on morale and productivity on the remaining employees.

Workplace measures such as these, however, need to be complemented with a broader approach to adjustment as discussed in the next section.

Recommendation #3

We recommend that, in addressing significant and discontinuous change that includes but also extends beyond environmental concerns, business and labour should extend joint workplace processes. The purpose would be to assess fully the implications of

change and devise solutions that would remove the fear and uncertainty of change. Such discussions would respect the confidentiality and proprietary concerns of companies vis-à-vis their competitors and could include the following areas:

- i) significant changes in production technology;*
- ii) training needs and required skills; and*
- iii) job implications of changes.*

Recommendation #4

We recommend that business and labour devise workplace solutions to facilitate adjustment and ensure that the costs of change are distributed across different parties.

Sector Issues

Some environmental problems are common to firms within a given industrial sector. Responding to these challenges therefore requires an approach that extends beyond a single workplace and seeks an alternative to piecemeal responses. The precise nature of a wider approach can vary among the sectors and is likely to have many dimensions. At one extreme is the formal establishment of a sectoral council for the entire sector across all regions of the country. Other, less all encompassing, solutions may be limited to certain groupings of teams of the sector, or certain regions within the sector. The formal arrangements can vary from formal councils to memorandums of understanding and agreements reached between a set of multi-stakeholders. The important elements are that the arrangements are appropriate to the nature of the issue and that business and labour are comfortable with the arrangements and continual dialogue is provided for.

Such approaches can make more effective use of resources in addressing environmental concerns and allow firms to openly discuss particular concerns of a non-competitive nature. Such sectoral responses across different workplaces also mean that the environment is not compromised in order to achieve a competitive edge among domestic work sites. The case studies have pointed to a number of important areas that an approach beyond the workplace can address which include:

- resource availability and land use;
- training;
- measures to minimise the impact of job losses;
- information on long term trends; and
- information sharing among peers.

A principle underlying any broader approach is that it be developed and operated with the full consent and approval of both parties. Additionally other interested parties should also be provided with opportunities for input and discussion on issues of interest. This

includes business, labour, government, communities, environmentalists, and Native groups.

Resource availability and land use

As already mentioned environmental issues can have dramatic long term consequences for resource industries and their local communities. Resource availability and sustainability is critical and is bound up in the questions regarding other land uses. The results of decisions on land use will affect all stakeholders and can have significant employment effects in the immediate term. Environmental and land use issues are principally long term ones and a site by site approach will not achieve the long term sustainability of communities, industries and the environment that is desired. It is critical that decisions concerning land use be developed as part of a long term perspective on the resource.

Recommendation #5

We recommend that government, with business and labour support and in consultation with other stakeholders should develop land use plans for resource sectors that are developed with a long term view based on sustainable development principles. Such plans should be clear and precise. They should provide for the sustainable development of the resource and include assessment of the social, economic and community impacts as well as environmental concerns. They need to provide certainty of access for both industrial and other users.

Measures to aid the transition to new opportunities as well as minimize the impact of job losses

Environmental changes can lead both to job losses and some employment gains in related areas. To ensure that the costs of job losses, downsizing and plant shutdowns are minimised, particularly in those sectors that face high environment-related costs, effective adjustment measures need to be established. The types of adjustment pressures can vary in different sectors. In forestry, for example, a reduction in annual allowable cut can translate into job loss in a short span of time. Pit closures and downsizing can dramatically affect jobs in the mining industry. However, closures are specific, sporadic and traumatic events requiring different solutions from downsizing, which may be of a more partial nature. There is also an environmental effect on *potential* jobs in the mining and forest sectors if certain projects are not approved. However, adjustment measures for these lost potential jobs are almost meaningless. In the chemical sector environmental pressures could lead to the phase-out of certain chemicals and therefore some lost production and jobs.

In all these industries environmental pressures can also lead to job opportunities in sector related areas. In forestry, cleanup of roads and watersheds, increased plantings, silviculture, improved resource planning, and less capital intensive means of cutting are all potential sources of different employment. In mining, site reclamation is an area that can provide some jobs of an environmental nature as Sudbury has successfully

demonstrated. In chemicals, new substitute production can create some opportunities to absorb job losses from production lines that have been phased out because of environmental concerns.

The challenge is to provide assistance that helps the transition from one job to another across different worksites, including those outside of the sector. Adjustment measures will have to look beyond issues such as severance pay or early retirement that are appropriately resolved at the workplace level. This may involve a greater focus on allowances for education and training (particularly in computer skills), counselling and mobility assistance, especially for affected workers in remote communities. A co-ordinated approach in these areas that addresses the particular concerns of labour and business in the sector could be more efficient, effective and equitable. For example, CSTEAC is a joint approach that has dealt with the periodic downsizing of large numbers of workers in the steel industry in Canada. MITAC in the mining industry is expected to undertake a similar process.

With such adjustment support in place, the fear of change felt by many workers, particularly older workers, would be alleviated and could lead to a more pro-active stance towards environmental responses.

Recommendation #6

We recommend that business and labour establish adjustment measures which go beyond a single workplace. Such adjustment measures should be designed to facilitate the transition for workers between environmentally obsolete jobs and new opportunities created. Such adjustment packages could include the following options:

- i) education/training allowances;***
- ii) counselling; and***
- iii) mobility assistance.***

Training

As the case studies have all demonstrated, the skill sets needed by workers can be greatly changed by responses to environmental pressures. Training has been necessary in all cases though the specific skills requirements have varied. Training is thus an important component of achieving successful adjustment. In discussing training three aspects are important:

- the actual skills developed;
- the design of training programs and their delivery; and
- the equality of access to training for all groups.

In terms of the skills required, responses to environmental concerns have often involved the introduction of new equipment. Often this equipment is more computerised than its predecessors so that training in general computer skills is required. The new equipment often also requires specific training on pollution prevention. New environmental

technologies demand new skills and knowledge. New training manuals and programs will need to be developed. In some cases, changes call for higher education levels to manage the environmental planning and new production processes. In workplaces, environmental awareness and auditing training have also been required.

The new technologies and new practices resulting from environmental challenges can lead to new occupational classifications and new skills. Changes in trades classifications and apprenticeships are likely. Traditionally this has been a sensitive area but through a joint approach with proper information and training programs in place, that can be applied across different workplaces, some progress can be achieved. Furthermore, as responsibility for environmental matters moves up the corporate level, so too the skill set for managing these issues can change. Research on the skill implications for management indicates that this will be an important area in improving environmental performance.

Some workplace cases, most notably in the chemical sector, have developed specific training programs in conjunction with local colleges. This is a useful activity where very narrowly defined operational skills are required to meet a particular production process. However, the types of skills outlined above in many cases are more effectively delivered through an approach that would be applicable across workplaces and prevent a “recreating of the wheel” by individual workplaces. Indeed, workplace programs may well have developed in the absence of any such wider program that can deliver the quality of human resources with the requisite skills sought.

A common concern in many of the case studies and in briefs from both the mining and forestry sectors is that obtaining workers who will possess the right skill set for the work in the 21st century could be problematic. The growing pressure from environmental concerns and responsibilities means that many existing designs for training programs will have to be altered. Many existing apprenticeship programs will need to be overhauled and improved. Common standards within a sector or industry could be developed to provide greater commonality of use among firms and workers in the sector.

Finally, it is a key principle that training programs be equal for all groups. The forestry and mining sectors share a common characteristic in that they are located in remote communities where the educational infrastructure faces problems of diverse populations in remote areas. Certainly any attempt to ensure that Native people increase their share of employment in these sectors will depend to a large part on their access to training and the removal of any systemic barriers to training. New methods of delivery such as distance education and different educational tools will have to be incorporated into the training programs.

The development of these training programs poses a number of challenges, and training programs will need to be designed to meet a number of different cases. Training programs should build in the maximum possible degree of flexibility in design and delivery mechanisms. Because of the differing circumstances in each sector, sub-industry and region, these broader training programs should be developed jointly by business and labour. Because the need to remove systemic barriers can alter some design aspects of a

program, Native groups should also be involved in the development of training programs in which natives form a significant share of the trainees.

Recommendation #7

We recommend that business and labour expand and improve training programs within and across different workplaces. These programs can be used as a complement to public education but would address the following types of skill requirements:

- i) computer skills;***
- ii) environmental technology skills;***
- iii) environmental auditing and management skills; and***
- iv) environmental planning.***

Recommendation #8

We recommend that business and labour carry out assessments of the changes in skill requirements and trade classification necessary to meet expanding environmental concerns. Such assessment would include the tasks of front line workers and environmental management.

Recommendation #9

We recommend that business and labour examine existing access to training programs across different workplaces and develop delivery and design mechanisms that ensure there are no systemic barriers to access.

Information on long term trends

A critical element in encouraging improved environmental performance is the ability to anticipate developments in environmental issues. As the Uniroyal case shows, unanticipated environmental pressures can have devastating effects on workers and workplaces. Even the best laid structures of consultation and discussion in a workplace can only deal with the immediacy of such situations.

A critical requirement for anticipation of events is the provision of timely and relevant information. Currently there is a large amount of information on environmental trends and other related development in both government and non government sources. However, much of this information is too wordy or in a form that is not appropriate to labour and business at workplace levels. On the other hand, there has been little attempt to define what type of information and in what format would be useful to people at the workplace level. A need therefore exists to define this gap in information needs and availability. Such an approach could be a co-operative one between business and labour and would provide a sounder basis for a common understanding of environmental responsibilities and responses.

Recommendation #10

We recommend that business and labour jointly define information needs regarding economic and environmental trends in particular sectors and suggest ways to improve the collection, presentation and dissemination of information on these trends.

Leadership and information sharing among peers

The value of the case studies reported here is that they do provide some examples of practical steps both business and labour have taken to improve environmental performance. They also show the value of joint approaches to common problems and the effectiveness of such approaches in addressing environmental concerns.

In many cases the broader responses do not include all companies in one sector. Many companies have become leaders in developing responses at a sector wide level. The challenge for these companies is to bring other companies into the approach, partly through peer pressure but also by publicly recognizing the value of such approaches.

The collection and dissemination of information of successful case studies and examples of labour business co-operation should become an important role of any sectoral organisation where it exists. In addition sector organisations should collect and disseminate information on occupational changes and changes in employment, as well as the data on the economy and environment already mentioned.

Recommendation #11

We recommend that existing sectoral organizations should provide leadership and actively encourage participation by all relevant companies and unions in sectoral approaches. The methods to achieve this would include peer pressure by existing members and the collection and dissemination of successful case responses to environment pressures.

Community Issues

In the resource sector, environmental issues that affect resources will have major implications for many communities. There is a clear need to ensure that the community is engaged in the discussion surrounding environmental issues. It is important that uses of resources be discussed in the context of community plans and community development. In isolated communities that depend on one economic activity, greater economic diversification should be a priority. Furthermore, it is critical that community plans reflect the strengths and composition of the community. In communities where aboriginals play a significant part, employment of aboriginals and their access to community development programs should be a major consideration.

In processing operations the environmental performance of the company can affect the environmental quality of life for the surrounding community. From the processing case studies it is clear that full discussion with the local community builds greater trust

between business, labour and the community. Full information also allows community members to have input into decisions that can have an impact on the environment of the community and provide for plans for responses in cases of emergencies such as accidents or spills. In some cases the trust built has led to co-operation in other areas between companies and local community groups.

In all of these efforts to ensure that environmental matters are integrated into community economic development plans, it is incumbent upon business, labour and government to provide leadership in initiating and establishing such processes.

Recommendation #12

We recommend that full consultative processes be adopted which provide information exchange and communication between community groups and business and labour regarding environmental issues at the community level.

Recommendation #13

We recommend that business, labour and government provide support and leadership for community economic plans and ensure that they are consistent with long term sustainable development in the sector on which the community depends.

Role of Government

The evidence presented here has been concerned principally with joint approaches by labour and business to environmental pressures. However, environmental issues are clearly everybody's responsibility. Evidence from the case studies and other countries suggests that governments are useful in encouraging greater social participation to reconcile environmental and economic concerns in which consumers, workers, producers and governments all have an interest to pursue.

The traditional view of pollution is that the polluter pays, i.e., the offending producer. Yet the products of the production process are demanded by consumers who cast dollar votes for that product and the associated production process, including any environmental degradation. When regulations are enacted to prevent the environmental degradation, often the cost is lost production and lost jobs. The effects are thus borne by business and labour without direct signals to the consumer that such production processes are environmentally unsound.

To develop a greater understanding of these issues requires a process in which business, labour and governments have a key role to play. Pivotal to the process is dissemination of information and support for discussion by all participants. One role of government is to support the collection and promotion of environmentally sound practices and the inherent choices in such activity. This educating function is critical for greater understanding of the complexities of environmental issues and responses.

Governments have many other roles. They have the power to make laws and regulations governing environmental and industrial activity. They are also collectors and distributors

of tax revenues. Governments have had a role to play in providing a balance between conflicting views on issues. Government programs have been provided in the past to fill the gaps and provide support for industrial activity as well as those adversely affected by economic change. The case studies are interesting in that they indicate a lower priority to program provision by government, which now operates in tightened fiscal circumstances. Some change in the role of government is suggested.

The evidence from the case studies suggests that the government can play a role as supporter and facilitator of multi-stakeholder processes. This does not exclude government as the final arbiter of appropriate public policy, but does suggest a more collaborative contribution in bringing together a wide range of interested groups to discuss and, more importantly, to resolve critical issues, particularly in forestry and mining. The mining case study provides an interesting model of how governments can move decision-making on resource issues away from central government agencies and into consensus bodies composed of the various interests. The recommendations have thus far pointed to such a supporting role for government.

However, where conflicts remain, the government still exists to provide some balance between different perspectives and to decide on policy. In order to achieve this, it is important to establish a proper regulatory framework at both the federal and provincial levels. This includes activities that affect the environment. A proper regulatory framework is essential for providing clarity, certainty and uniformity in the application of existing environmental regulations. The proper environmental framework provides for a level playing field in the application of environmental regulations and supports.

The case studies have provided evidence of how the process of environmental regulation could be improved thus increasing its efficiency. Participants in the case studies accept the right of governments to enact laws concerning the environment and generally had few concerns with the technical standards found in the regulations. However, concerns were expressed on a number of occasions about the process of environmental regulation. The overlap and duplication between federal and provincial jurisdictions was noted and some concern about the application of Canadian environmental regulations *vis-à-vis* other industrial countries was also present.

The major concern was the length of time to complete the various processes. Such delays clearly can be costly to business in terms of cancelled investment and lost output and costly to unions in terms of employment prospects. The process of applying for permits to produce new chemicals under CEPA, for instance, was regarded as lengthy, partly because of the time taken for consultation with different parties. The approval time for new chemicals is in many cases twice that in the U.S.

Environmental Impact Assessments were a source of concern in mining, particularly since such assessments could be required for the both the federal and provincial governments. Lengthy delays in projects with large funds attached to them make this a particularly worrisome concern for both business and labour.

Recommendation #14

We recommend that governments, with guidance from both business and labour, support the documentation and promotion of good practices that integrate economic and environmental concerns.

Recommendation #15

We recommend that governments seek to establish a regulatory framework that provides clarity, certainty and uniformity in the application of environmental regulations.

Recommendation #16

We recommend that governments, in consultation with business and labour, review and improve their processes related to environmental impact assessments for resource projects and approvals process for new chemicals without compromising safety or health standards.

ENDNOTES

- ¹ See for instance Bhalla, A. S , *Environment, Employment and Development*, International Labour Office, Geneva, 1992; Roger Bezdek, *The Net Impact of Environmental Protection on Jobs and the Economy*, Washington D.C 1993; and E.B. Goodstein *Jobs and the Environment: The Myth of a National Trade-Off*, Economic Policy Institute 1994. An Informetrica simulation completed in April 1993 for the CLMPC, confirms these results for Canada.
- ² The Conference Board of Canada has undertaken a number of studies of environmental management in certain sectors by companies: see *Industrial Competitiveness, Trade and the Environment*, Reports on Phase I, Phase II, Phase III.
- ³ Angus Reid Report, July/August 1995.
- ⁴ Angus Reid Report, November/December 1995.
- ⁵ CLMPC Labour Business Leadership Survey, 1996.
- ⁶ Such international agreements included the Antarctic Treaty, the International Convention for the Regulation of Whaling and the Convention on the Territorial Sea and the Contiguous Zone.
- ⁷ Michel Potier, "Agreement on the Environment", *OECD Observer*, August/September 1994. See also the Conference Board of Canada, *Voluntary Measure for Environmental Protection Report 149-95*, Ottawa, 1995.
- ⁸ Canadian Environmental Management Survey, KPMG, 1994.
- ⁹ According to the Canadian Environmental Management Survey, KPMG, 1994, 98 percent of respondents in the resource sector and 93 percent in the manufacturing sector viewed compliance with regulation as an important reason for environmental concern.
- ¹⁰ International Institute for Sustainable Development (IISD) *Coming Clean: Corporate Environmental Reporting*, Deloitte Touche Tomatsu International, 1993.
- ¹¹ According to the latest KPMG survey, the proportion of full time employees responsible for environmental issues rose from 44 percent in 1994 to 66 percent in 1996 of those surveyed. KPMG Canadian Environmental Survey, 1996.
- ¹² Peter James and Stephanie Stewart, *The European Environmental Executive; From Technical Specialist to Change Agent and Strategic Co-ordinator?*, Ashridge Management Research Group, Ashridge U.K. 1995.
- ¹³ Diligence is a legal term relating to the liability of a company in taking measures to prevent environmental incidents. Establishment of an environmental committee could be one such measure that could satisfy the due diligence test.
- ¹⁴ International Labour Organisation (ILO), "The practical role of trade unions in improving environmental protection and sustainable development", Background paper, Symposium on workers' education and the environment, Geneva, October 1993.
- ¹⁵ Ernst Hollander, *Varför var det så segt? Om lågrisk kemi, miljödriven innovation och kravformning* (The Enigmatic Time Pattern of Environmental Innovation), 1995.
- ¹⁶ Price Waterhouse, *The Canadian Pulp and Paper Industry: A Focus on Human Resources*, 1994. This study was overseen by representatives from industry, union and government officials and was concerned with the problems of over capacity and the impact on employment in the industry in the medium to long term.
- ¹⁷ Conference Board of Canada, *Industrial Competitiveness, Trade and the Environment: A Look at Three Sectors of the Canadian Economy*, Ottawa, 1993.

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- ¹⁸ MDF refers to medium density fibreboards and OSB is oriented strand board.
- ¹⁹ Elemental Chlorine Free (ECF) pulp is becoming the standard in both Europe and North America while the more expensive Totally Free Chlorine (TCF) pulp is sold mainly in Germany. In anticipation of a strong demand for chlorine free pulp and paper, the B.C. government ordered a two stage ban of the use of chlorine by 2002. However, recently sales of chlorine free pulp have virtually disappeared.
- ²⁰ Canadian Industry Program for Energy Conservation (CIPEC) Annual Report 1994-95.
- ²¹ *Our Common Future*, The Final Report of the United Nations Commission on Environment and Development, 1987.
- ²² *The Forest Round Table on Sustainable Development Final Report*, National Round Table on the Environment and the Economy, April 1994.
- ²³ Conference Board, *Industrial Competitiveness, Trade and the Environment: A Look at the Canadian Non-Ferrous Metals Industry*, 1994, p 4.
- ²⁴ In early 1991, reserves of copper, nickel and zinc were about two-thirds of those reported in 1981. Furthermore, in 1992 total spending on exploration was \$385 million, the lowest level since 1967.
- ²⁵ The UNOX process is a high-rate oxygen activated sludge system which uses bacteria to break down organic compounds in the effluent from the mill.