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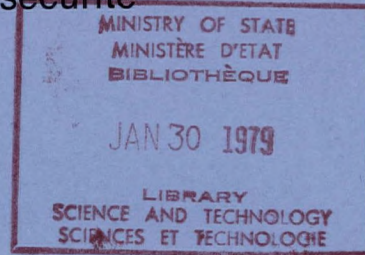
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FUTURES STUDIES

A QUALITATIVE SURVEY AND STUDY

Federal Government of Canada

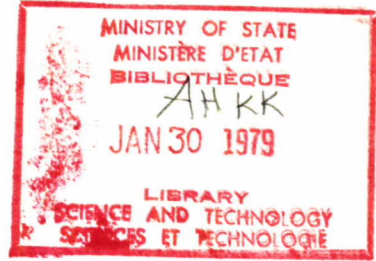
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FUTURES STUDIES

A QUALITATIVE SURVEY AND STUDY

Federal Government of Canada

VOLUME I

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Secretariat for Futures Studies
Technology Assessment Division
Ministry of State for Science and Technology

September, 1977

Futures Studies
 A Qualitative Survey and Study
 Federal Government of Canada
 VOLUME I

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Volume I

This qualitative report assesses the futures efforts in a number of selected federal government departments, as a necessary follow-up to the Lamontagne Survey of 1975.

The Introduction reviews the state of futures studies in the federal government, utilizing the Senate Special Committee on Science Policy's survey and the previous publication of the Secretariat for Futures Studies, MOSST, "An Analysis and Summary of the Lamontagne Survey", as a base.

The second section contains the results of the qualitative survey of twelve departments, selected upon the basis of the significance of their futures efforts within the federal government.

In the third section, the futures efforts in three departments, namely, the Department of Communications, the Department of National Defence, and Transport Canada are evaluated using the theory developed in Volume 2.

The fourth section is a brief description of the Secretariat for Futures Studies, MOSST, and its role within the federal government.

The observations regarding the state of futures studies in the federal government are given in the final section.

FUTURES STUDIESA QUALITATIVE STUDY AND SURVEYFederal Government of CanadaI INTRODUCTION

A number of recent events and concerns have focussed attention on futures research work conducted in the Canadian government. Examples are the Lamontagne Senate hearings on Science Policy and the Gamma report on the conserver society. There has been a growing concern with the domestic long-term energy picture and other resource problems such as those looked at by the Club of Rome. Canada has also participated in various internationally-sponsored projects, such as the Habitat Conference and the OECD Interfutures project. These address long-term social and economic issues with worldwide implications. While there appears to be a generally held view within government circles that longer-term studies and planning activities can potentially be of great benefit to public decision-making, there has always been some concern about the "quality" and "relevance" of futures work conducted in the federal government.

Futures studies are studies that focus specifically on identifying and clarifying possible social, economic and technological trends, changes and needs. It is felt that this activity

will strengthen the ability of decision-makers to recognize and choose from many complex alternatives those which have a long-term beneficial impact on society. One can differentiate between forecasting, long-range planning and futures studies; however in practice, this distinction is not often made.

Every decision implies some assumption about the future; it is the function of futures studies to make those assumptions explicit. Since one cannot know the future precisely, one must delineate alternative possibilities so that choices can be tested against various future states that could occur.

The field has been pursued under essentially four different classes:

1. The projective approach (trend extrapolation, envelope curves, multi-variable correlation models, mathematical models, stochastic models, input-output matrices, etc.);
2. Prospective research (scenarios, Delphi method, morphological method, cross-impact matrix, simulation of future options, etc.);
3. Decisional research (cost/benefit analysis, relevance trees, network theory, decision and control steps, social assessment of technology, etc.); and

4. Planning instruments (formulation of objectives, value analysis, conflict-analysis, optimization techniques, PPBS, sensitivity analysis, game and simulation models).

Futures research has by no means been limited to these principal approaches. Futures research has included approaches from pure imagination to a directive, normative type of approach.

A significant increase in national and international futures dialogue has occurred over the past decade. This development has been caused by anxiety over political and social uncertainties, and new perceptions of resource limitations. These concerns have been particularly linked to the Club of Rome study The Limits of Growth, the controversy it stirred, and the oil crisis of 1972-3. There is now no doubt that we face a transition period in the cost of energy and its use. This will necessitate structural changes to society, the socio-economic system, accepted culture, social mores, and values.

At about the time of the oil crisis of 1972-3, steps were initiated at the Privy Council of Canada by the then Deputy Secretary to the Cabinet, C.R. Nixon, and in the Senate of Canada by Senator Maurice Lamontagne to organize a rationalized futures research effort in Canada. These steps led to the creation of the Institute for Research on Public Policy (IRPP) which was charged with creating a centre of expertise useful to both the private and public sectors. These initiatives also led to the creation of the Secretariat for Futures Studies in MOSST to act as a clearinghouse and to act as a catalyst for futures studies within the federal government of Canada.

The terms of reference for the Secretariat were stated in a letter (January 27, 1976) from C.M. Drury, then Minister of Science and Technology, to Senator Lamontagne.

- 1) to be aware of all futures studies in the federal government, and to provide assistance and advice as requested, by summarizing, cataloguing and identifying the scope of futures programs and activities;
- 2) to provide secretarial services to the Interdepartmental Committee on Futures Research by scheduling and arranging meetings, by taking and distributing the minutes, and by performing other duties requested by the Committee; and
- 3) to be the central contact point for general information purposes for persons and organizations outside the government.

The Lamontagne Survey of Futures Studies

During the fall of 1975 and spring of 1976, the Senate Special Committee on Science Policy under the chairmanship of Senator Maurice Lamontagne initiated and completed a survey of futures studies in Canada.

A quantitative analysis and summary of the results of this survey was performed by the Secretariat for Futures Studies in the fall of 1976. This analysis and summary showed that on a primarily quantitative basis the federal emphasis was first in Resource Conservation and second in the Human Environment. The private sector was

primarily interested in the Economy and secondarily in Resource Conservation. In 1975-76, the year for which data was the most available, federal expenditures on futures research totalled in excess of \$3,712,563 (in excess because many expenditures were difficult to segregate out, such as overhead and related salaries, or were not reported). The reliance on outside institutions rested mainly on the Hudson Institute, Economic Council of Canada, OECD, IRPP and the World Futures Society.

Because of the nature of the survey and of the responses, it was not possible to assess how directly this research related to the needs and aspirations of the Canadian people and consequently decision-making by the government. The issues that were under study did, however, bear a fairly close relationship to those issues receiving the largest amount of publicity.

The Lamontagne survey was perhaps revealing in that it showed a general tendency for government departments to carry out research into areas which might be termed as areas of basic necessity to the physical survival of the Canadian system. These are areas where critical survival issues lie, e.g. energy, food, minerals, pollution, crime, etc. Such research could be interpreted as a tendency to maintain the current system, to keep the present permutation relatively permanent. For example, there has been little or no research into the future of Canadian culture, the arts, the strengthening of individual liberties, increasing the creative potential of the individual (entrepreneurship), expanding the opportunities, variety and interaction among Canadians, the creation and development of new knowledge frontiers,

etc. It might be interpreted as a closed statically inclined system rather than a dynamic one seeking an improved optimal permutation.

This may be because the old frontiers, the old barriers, were most concerned with survival with physical sufficiency and, now that these barriers have been broken, we are left with the same preoccupation, without the frontiers.

One fact that has become clear in the last decade is that the present Canadian system in terms of physical consumption cannot be maintained and will be forced to evolve. The Lamontagne survey and subsequent knowledge of the field has shown that there seems to be little or no research as to what this new direction should or could be. Society will have to consume less in terms of physical substance, or in other words, be poorer in terms of physical consumption. The question of whether society may be able to reach an acceptable standard of living in terms of satisfaction and other similarly important questions have only been superficially touched. Most of the federal studies, such as the Conserver Society study, have been concerned with how to survive with less, not how to grow with less. This is perhaps a serious gap in the Canadian futures effort. The system will probably survive with less but, without any research as to how it can survive better with less, it may well survive worse with less (that is, stress, boredom and dissatisfaction would increase).

In the federal government there also seems to have been perhaps too heavy an emphasis on technique rather than imaginative thinking in some futures studies. This has perhaps been because some

have considered futures research to be a new modern computerized oracle and others have considered it as a technological methodology for promoting and selling particular programs. Many techniques have been used extensively but it is sometimes questionable (from the content of some futures reports) how well or how genuinely they have been used. This is perhaps fertile ground for the Secretariat to investigate and upgrade. Techniques can be improved and used more appropriately (instead of being used to bring about desired answers).

The areas of research might also be interpreted as largely having been first put forward politically either by politicians, institutions or individual citizens. Futures studies have been led into the future, rather than leading. This may again be an important gap as one of the prime and most useful functions of futures research is to outline future options in aid of decision-making, to help leaders lead. Futures research may to a large degree not have been performing this role in Canada. A most effective and necessary role of futures studies is its early-warning role, to outline probable opportunities and problems for legislation. It would seem this role could be developed much more. For example, the dimensions of future problems such as energy could be usefully extended in the social area.

There seems to have been too much emphasis put on the impact role of futures research, i.e. what will be the impact of various trends, and not enough upon what is a desirable course of action and how such a course might be implemented. There has been a lot of research on where we are going, but not enough on should we go there, and what should we do if we get there, or somewhere else.

In addition, some process for testing the credibility, reasonableness of assumptions and approach seems to be needed and used on a wider basis, because it is on these criteria that futures research will be used for decision-making and policy formulation.

In the private sector the marketplace dominates and the health of the marketplace is wholly dependent upon the health of the economy. So it is not surprising that the private sector is primarily interested in future economic issues. What may be surprising is the secondary emphasis upon Resource Conservation. The research areas and actual research in the private sector seem also impact and survival oriented, rather than what future might be desirable, and how to get there.

What Are Futures Studies?

"They are studies that focus specifically on identifying and clarifying possible social, economic and technological trends, changes and needs, thereby strengthening the ability of decision-makers to recognize and choose among complex alternatives those which have a long-term beneficial impact on society". (MOSST, 1975)

Futures studies have long been integral to man's culture and way of dealing with the environment. It has only been relatively recently that the field has been pursued in a systematic, rationalized manner. The important change came with the application of rationalized, systematic scientific logic to the study of the future.

The OECD recently stated no realistic exploration of alternative patterns of future development can ignore technical or

scientific changes, and Keynesian or neo-classical economics are not capable of assessing or analysing fully the nature and consequences of scientific and technological change.

Expanding upon this theme the OECD said given these facts, political action now requires mechanisms for the systematic exploration of futures options, particularly those afforded by science and technology. More specifically, the interactions between the functions of futures studies and strategic planning on the one hand, and the scientific and technological system on the other, take place at three levels.

1. Science and technology are fundamental factors of change in society, the prospects opened up by them and the questions they pose are indispensable elements to be taken into account in futures studies.
2. In both its theory and practice futures studies borrows from many disciplines including both natural and social sciences, and engineering.
3. By their very nature, the results of futures studies and the conclusions derived from strategic planning should provide the framework for policies for science and technology.

The rationalized pursuit of futures studies can therefore provide some concrete ideas for policy and consequent planning. This is perhaps the primary and most important role for futures studies, that is, to stimulate, catalize new ideas, new perspectives upon the future.

II UPDATE OF FUTURES WORK IN THE FEDERAL GOVERNMENT

1. Canadian International Development Agency
2. Communications
3. Energy, Mines and Resources
4. External Affairs
5. Finance
6. Industry, Trade and Commerce
7. International Development Research Centre
8. National Defence
9. National Research Council
10. Regional Economic Expansion
11. Transport
12. Treasury Board Secretariat

FUTURES UPDATE

CANADIAN INTERNATIONAL DEVELOPMENT AGENCY

Responsible Officer: L.A. Dorais,
Vice-president, Policy Branch

Dates: May 18, 1977
May 24, 1977

Persons Interviewed: Charles Jeanneret, Chief,
Prospective Group,
Policy Branch.

Domingo Donida, Director,
Policy Analysis Division,
Policy Branch

As far as long-term planning and futures studies are concerned, the Prospective Group and the Policy Analysis Division appear to be the two relevant places in the Policy Branch.

This branch is responsible for the coordination of the policies and the programs of CIDA Branches in order to formulate global policies and to ensure comprehensive planning and program evaluation. It stresses the importance of prospective thinking on international development.

Prospective Group

The Prospective group, headed by Charles Jeanneret, is a group of 3 persons, (2 professionals and 1 support) set up in 1974. Its objective is threefold:

- 1) development of a conceptual framework for prospective as it relates to international development and promotion of awareness for long-term thinking in CIDA in regard to international development and cooperation;

- 2) look at future international cooperation;
- 3) develop concrete policy alternatives for Canadian international cooperation.

Many of their initiatives have been directed towards the integration of prospective into planning (internal planning process at CIDA and governmental planning in general). They have provided in 1974 a background paper for the 1975-1980 CIDA strategy (the basis of planning in CIDA), and then a critique of its first year of implementation in July 1976. They also set up with the ex-Advanced Concepts Center at DOE, a series of interdepartmental workshops on prospective: one workshop was held in 1975 ("Prospective on Environment and Development: ASIA: Pacific Rim") and two others in 1976 ("Eco-Development, National Development and International Cooperation Policies" and "The International Development Problématique"); a fourth one should be held this fall on the relationships between Canada and the Third World.

The Group has tried to develop links with networks of prospective in cooperation at the national and international level. They are now related to prospective projects in Europe and Africa and a little with South America. In Canada, where the prospective in cooperation is not very much developed, the Group has contacts with a few places (IRPP, ECC, PAG (External), IDRC). They tried to set up a Prospective Institute in January 1976, but it failed. Moreover, Mr. Jeanneret is associated with a U.N. University (Tokyo) Project (Human and Social Development Division) on goals, processes and indicators of development and with the futures studies program

of the Inter-University Centre of post-graduate studies at Dubrovnik, Yugoslavia.

Finally, the Group is involved in a prospective project, with the Sahel Section of the Bilateral Programs Branch.

Policy Analysis Division

The Policy Analysis Division is especially involved in task forces with the Bilateral Policy Advisory Group (BPAG), Bilateral Programs Branch. These task forces, established by the President's Committee (President and Vice-presidents), deal with some long-term policy issues relating to aid or development. In terms of priority they are the following:

- 1) Concentration on the poorest;
- 2) Transfer mechanisms;
- 3) Local cost financing;
- 4) Sectoral papers;
- 5) Typology of development;
- 6) Country program reviews.

One of them, "Typology of development", is being done with the assistance of university consultants (Carleton). Another one, "Sectoral papers", is an update of the Sectoral Guide published in 1975.

The Division is also active in interdepartmental committees dealing with aid, especially in ICERDC recently (on the North-South Dialogue). Incidentally, the new CIDA President, Michel Dupuy, is Deputy Co-chairman of this international conference, but the

involvement of the Division goes back before his nomination last March. The Division was active, too, in the preparation of the Industrialized Countries Summit held in May 1977 in London.

Internally, the Division is helping the Multilateral Programs Branch in its program review and the Non-Governmental Organization Division (Special Programs Branch) in some circumstances (organization of its work plan). The Division is also performing an educative function through in-house seminars. Two will be held this year (one in English, one in French) for the planning officers of the Bilateral Programs Branch and with the help of external resources. The theme will be the development theories. No joint formal endeavour, however, exists between the Policy Analysis Division and the Prospective Group.

FUTURES UPDATE

DEPARTMENT OF COMMUNICATIONS

Responsible Officer: D. Parkhill
ADM (Research)

Date: June 27, 28, 1977

Persons Interviewed: J. Halina, Director-General
Research Policy and Planning

Dr. J. Chapman
ADM (Space Program)

The organization for futures studies in DOC is considerably different from that of other departments. There is no single position or group established to conduct and oversee futures studies for DOC, which is, in part, a reflection of the fact that DOC does not conduct futures studies per se. Instead, several groups investigate a number of research subjects and policy areas which might be seen to come under the general umbrella of futures studies. These subjects and areas include requirement needs, priorities research, systems/technological forecasting studies, resources planning and impact analyses.

Principal elements to the "futures" organization of DOC are J. Halina, Director-General, Research Policy and Planning, D. Parkhill, ADM (Research), and Dr. J. Chapman, ADM (Space Program). The process around which this organization operates differentiates DOC's futures efforts from those of other departments. The identification phase where the need for futures studies is established originates usually at higher levels in the organization at the time priorities are set.

These are transmitted down to a lateral system of working groups, which in the formative and consultative phases of futures studies, bring to bear the elements of futures studies most relevant to the communication policy areas or resource issues being examined. Thus the product which is then conveyed vertically to senior management is future-sensitized and in the process of this vertical move can be referenced, as often as required, against the completed "background" futures studies. Futures considerations, therefore, penetrate most position papers and proposals submitted to senior management.

The time-horizon for most DOC futures-oriented efforts is 10-15 years. DOC experience can be divided, for analytic convenience, into two sections: futures efforts directed at the overall policy structure of communications in Canada, and those zeroing in on specific resource/hardware issues. It was indicated that the most important potential contribution futures studies could make to DOC was in the former area, though at the same time, this was probably the most difficult area to address.

Joe Halina has been largely responsible for initiatives in the first area (overall policy structure). The two major futures efforts here include -- "Perspective 1985", published in February 1975, and a sequential "Threats and Opportunities" in the Development of Canadian Public Telecommunications in the Next Decade" published in April 1977. Taken together, these products comprise the department's systematic attempt to examine its entire "constituency", ascertain

its dynamics and the long-term directions in which it is heading; and to explore the R&D priorities in Canadian public telecommunications development. The ulterior purpose of these efforts is to facilitate the regulatory and catalytic roles that government may be called on to play in communications in the coming decade. The details of "Perspectives 1985", i.e. assumptions, scope, methodology, are described in DOC's response to phase 1 of the Lamontagne survey. The basic conclusion, identified here for its linkage importance to the newer study, was that a major dichotomy which had begun to develop in communications between Canadian rural and urban sectors would persist into the next decade. The underdevelopedness and remoteness of the rural telecommunications sector were projected to intensify into the 1980's, where the quality of service providable at economically feasible rates would be vastly inferior to that available in the urban sector -- assuming continuity in existing financial and institutional arrangements. Exploration of technical, commercial, and operational alternatives was indicated so as to reduce investments needed under existing arrangements. The urban telecommunications sector was projected to continue its exhaustion of communications "space" which would restrict expansion of services and lead to or create over-investment and inter-carrier conflict. Greater rationalization of the telecommunications industry certainly before 1990 was indicated.

This futures-oriented effort was instrumental in effecting a rearrangement of departmental priorities, particularly where the development of the regional telecommunications sector was concerned. The next set of major concerns to the department which are already beginning to materialize as concrete problems are the issues in the content, delivery, and terminal sectors such as influence of the U.S. in telecommunications, the projected "shake-down" in the Canadian commercial broadcasting industry (including the appearance of PAY-TV on the scene), and increased domination of the subscriber terminal sector by Japanese and American corporations. These concerns are thoroughly investigated in the second document identified above, i.e. in the field of overall policy structure, the "Threats and Opportunities" paper.

FUTURES UPDATE

ENERGY, MINES AND RESOURCES

Responsible Officer: Gordon McNabb, Deputy Minister,
Energy, Mines and Resources.

Date: April 4, 1977

Persons Interviewed: James E. Gander, Director-General,
Energy Review Group.

F.W. Belaire, Study Coordinator,
Energy Review Group.

R.F.S. Robertson, Technology Advisor,
Energy Review Group.

In "An Energy Strategy for Canada: Policies for Self-Reliance", published in the summer of 1975, the Canadian Government specified a number of energy targets to 1990. These targets were set out against a dynamic and evolving background of changing energy supplies and demands, and of policy decisions made since 1973. Future energy scenarios were presented for the period 1976-1990. Within that fifteen-year period, the report did not envisage any significant displacement of oil and natural gas as the dominant energy resources. However, the study did recognize the need to begin now to examine carefully the possible energy alternatives over a longer transitional period than the next fifteen years. It noted that "What is necessary is to begin now to plan so that such a transition can take place in as smooth and orderly a manner as possible. These longer range issues will be addressed in a paper to be published later that will deal with alternative energy futures beyond 1990".

Long-Term Energy Objectives

For the period beyond 1990, Canada should strive for sustainable-self-reliance (SSR) in energy. This would require that a sufficiently large part of Canada's future energy needs be met from domestic sources so that in the event of disruptions of international supplies, the necessary adjustments could be made to permit the economy and society to function more or less normally.

Conditions of energy self-reliance are continually changing; they are always in a state of transition. Self-reliance, therefore, requires a dynamic, flexible and resilient approach -- one that can accommodate continual change and unexpected shocks. Self-reliance is sustainable because of that resilience to accommodate changes in energy demand, supply and in attendant economic and social conditions. That accommodation is made easier because the changes, the opportunities and the constraints are foreseen far enough in advance to ease the adjustment process in a flexible way.

There is, thus, no single state of sustainable, self-reliance. There need not be a single, dominant energy resource over the longer term future. Traditional resources such as oil, natural gas and coal are likely to be supplemented by emerging sources of energy such as nuclear power and oil from the oil sands. Major new factors can be expected to gain increasing prominence -- for example, greater use of renewable resources and far greater efforts to conserve energy and to use it more efficiently. The combination of possibilities

are numerous, and each carries widespread implications for the future of Canadian society. The combinations are not equally to be preferred. Each brings with it a host of technological requirements and requirements for changing inputs of many other kinds. By one means or another priorities and preferences will be established among them.

Among the key questions, therefore, are the following:

1. Can sustainable self-reliance in energy be achieved? If so, when?
2. What various accommodations of supply and use yield the most probable and the preferred conditions of sustainable self-reliance?
3. What constraints stand in the way of achieving sustainable self-reliance by each of the identified combinations?
4. What are the economic, political, institutional and societal implications of the various possibilities?

The Study Organization

The long-term energy assessment will deal with many topics within the energy sector or in areas substantially affected by the changing energy situation. The topics will be considered in terms of key questions and issues. These, in turn, involve perceptions of fundamental change in the energy sector, the economy and society.

The basic structure of the long-term assessment consists of the ten areas of focus listed below.

1. Economic & Social Setting
2. Energy Supply

3. Energy Demand & Conservation (The demand projections were made on seven scenarios including one defined as "conservers society" -- in all studies growth rates were between 1.3% to 2.6% per year (very low). Outside this key area of quantitative analysis the other sub-committees will give a picture of the environment at the time.
4. Environmental Concerns
5. Technology and R&D
6. Provincial & Regional Priorities
7. Finance, Ownership & Control
8. Policies, institutions and regulations
9. International aspects
10. Statistical assembly and systems

Each area of focus will be assessed by a task force, and considered in a matrix form to identify important cross-links among them. Each task force, when examining its own area of interest, will ensure that account is taken of the cross-links that are relevant to its work. The task forces also will ensure that information from outside their own groups will be systematically brought to bear.

The Energy Review Group will seek expert advice and evaluations from as many knowledgeable people as possible. Liaison representatives have been established with fifteen departments of the federal government. Liaison will be established with provincial governments, industry,

energy consultants, universities, public interest groups, experts in other countries and in international agencies.

Tentative Program Outline, 1976/77

By:

- November 30: Complete the basic organization;
Complete initial assessments of the ten areas of focus.
- December 31: Check the initial assessments with provincial governments and other outside experts;
Fill gaps and broaden the information base.
- January 31: Review the second phase of the work of the task forces;
Enlarge the outside contacts;
Prepare a comprehensive assessment around the main themes and key questions.
- February 28: Consolidate the task force results and identify gaps and inconsistencies;
Direct the outside assessments more specifically around key issues, opportunities and constraints.
- March 31: Follow-up the February work;
Bring the material together into a preliminary draft (or pre-draft) form.
- May 31: Complete the review of the preliminary report and of additional material;
Up-date all information and perceptions;
Begin the preparation of the final report.

July 31: Begin the final review of the report.

The Report

No meaningful outline can be provided at this time of the size and format of the final report and its supporting documents. The report will be a public document. Systematic follow-up is envisaged to receive assessments by technical experts, parliamentary groups and the interested public. A report on that follow-up, or some other subsequent report might then be in order. It is unfortunate that the committees are not working in conjunction with each other (i.e., the financing sub-group is not aware of the projections being made by the supply group). It is anticipated that such an effort may become a continuing one at EMR.

The Energy Review Group

The Federal Department of Energy, Mines and Resources has established a small group to conduct the study and prepare the report. The personnel are:

(Phone area 613)

James E. Gander, Director-General	593-5949
F.W. Belaire, Study Coordinator	593-4949
R.F.S. Robertson, Technology Advisor	593-5405

The Energy Review Group is located at:

Department of Energy, Mines and Resources
Room 333, 588 Booth Street
Ottawa, Ontario. K1A OE4

FUTURES UPDATE

EXTERNAL AFFAIRS

Responsible Officer: K. Goldschlag
Assistant Undersecretary of State
for External Affairs

Date: April 12, 1977

Person Interviewed: Chris Davis, Policy Analyst,
Policy Analysis Group

Futures studies, and any other related forward planning or research at External Affairs, naturally emanate from a need to meet certain stated objectives. Some of these objectives are: the presentation of a National identity, i.e., presentation of Canada as a "distinctive bilingual, multicultural nation", and preservation of the Federal authority for the origin of the conduct of External Affairs (responsibility of the Federal/Provincial relations branch).

Some major Futures research has been the Future Potential of Latin America -- completed by the Policy Analysis Group; Future Instabilities in southern Africa (PAG and area group); Futures of the International System (Developing Countries vis-à-vis Developed Countries) in terms of possible future demands upon Canada; the Future of Japan as related to Canada (PAG and area group); and, Trade Depending Study with an emphasis on Centralization. The results of these studies are sent on to the Research Committee made up of Directors General, and Directors from the various branches. The Policy Analysis Group acts as a Secretariat to the Research Committee. These results are then channelled into policy decisions by the Research Committee.

Other issues which the Department of External Affairs has dealt with in the Futures field have been:

- (a) What are the international consequences of a North American superstate (i.e., Canada plus U.S.)?
- (b) What steps must be taken in order to preserve sovereignty, independence, and a distinctive personality (especially in view of a giant neighbour -- U.S.)?
- (c) What economic steps must be taken to ensure political independence?
- (d) How best to make external policy reflective of the diversity and multicultural aspects of Canada?
- (e) Possible unstable regions such as the Russia-China border, South Africa, Middle East, Latin America, S.E. Asia, etc.
- (f) The Future of Aid and Trade flows.
- (g) Sectoral studies, e.g., Europe, Pacific, USSR, U.S.

In relation to these major objectives, specifics are also studies. These range from future energy problems to tourism, scientific and technological developments, pollution, conservation, trade blocks, armaments, the world economy, tariffs, social justice, peace and security, quality of life, defence treaties, Canadian institutional relationships in the international sphere, multinational activity, the white role in Africa, and narcotics and other contraband.

Also completed are major studies on International Development and the United Nations, Canada's role in NATO, Organization of

American States, and Canadian-Chinese relations.

The Policy Analysis Group is also responsible for research contracts which must be approved by the Research Committee and in some circumstances an Interdepartmental Committee. The Interdepartmental Committee on External Relations (ICER) meets to determine policy issues and the deployment of personnel abroad in the medium-term, 77-80. The Policy Analysis Group consists of three officers, R. Hathaway, C. Davis, and J. Roy (but is allocated six man-years) and a part-time academic in residence, P. Arnopoulos of the University of Montreal. Dr. Arnopoulos is under a \$10,000 contract to develop a basis for forward-looking research, and new perspectives for the 1980's. There is also a contract to do similar work for \$12,000 at the Center for Foreign Policy Studies at Dalhousie University, with an emphasis on what is called Canada's Third Option, and International perspectives.

The Special Research Bureau (SRB) does Futures studies on the Eastern Bloc Countries. In addition, almost every division does some Futures Research. The PAG has also produced a data set containing a complete set of regional profiles, which has made possible some trend analyses.

In the PAG, the chairman, J. Roy, is doing an organizational study of the department; R. Hathaway is studying issues and objectives of the department, NATO policy; and Chris Davis is most concerned with Trade and Aid. J. Roy is also concerned with a study of the role of the department in the Federal Government.

FUTURES UPDATE

DEPARTMENT OF FINANCE

Responsible Officer: Edmund Clark, Director,
Long-Range and Structural Analysis Division.

Update information supplied by the
Department of Finance.

Last December, the resources of the Long-Range Planning Branch were folded into the Economic Analysis, Fiscal Policy and Capital Markets Branch, and a new division was created called "Long-Range and Structural Analysis Division". This integration of the previously separate branches within the Department of Finance should improve the coordination of the activities within that department, and ensure that longer-term and structural considerations are more fully taken into account in economic policy work, which would fall under the mandate of the Department of Finance.

The new division is now developing and implementing a long-range work program. A new set of medium and long-range macro-economic projections is being prepared with particular attention devoted to examining the sensitivity of the projections to alternative assumptions. A particular effort is being made also to ensure that the material is accessible to, and usable by, other departments. The first stages of the work program and the interdepartmental discussion of it, has already taken place. This new division in the Department of Finance is also working to strengthen further the ability of the Department of Finance to do macro-economic analysis. A section devoted to assessing

current and future structural problems has been established in the division.

Growth in Canadian GNE (Gross National Expenditure) and GNE per capita to 1995. The methodology used in this project is based on the identity relationship that real GNE is the product of employment and real output per employee. Within this framework the problem of forecasting the growth of GNE becomes the problem of forecasting the growth of GNE per employee (aggregate productivity). A great deal of attention has been devoted to the demographic factors which underlie employment growth and thus the growth of real income. Projections are given of the population growth rates to 1995 and of the impact of the growth on either real GNE or real GNE per capita. Growth of "participation rates" have been examined with particular attention to relationship between demographic changes and changes in participation rates. It should be noted that the growth of cyclically-adjusted, GNE was forecasted to 1995 and not the actual GNE.

The main conclusions of the study are as follows:

- A. Sharp decline in rates of labour force growth
 - Primary cause is sharp decline in rates of population growth. This conclusion is not very sensitive to likely range of variation of population growth rates.
 - Plateauing of participation rates contributes to the easing of labour force growth.

- B. No major change in rates of growth of GNE/employee is expected
- C. Potential GNE growth rates decline significantly through to period ending in 1995
- D. Potential GNE/capita growth rates decline significantly through to period ending in 1995

Initial work in the Department of Finance has consisted of the analysis of the effect of different demographic assumptions on gross national expenditure growth and examination of the likely performance of participation rates over the next 20 years. An integral feature of this activity in Finance will be the continuation of on-going consultations with other Federal departments in order to foster a more cooperative approach to medium and long-term forecasting within the Federal Government.

FUTURES UPDATE

INDUSTRY, TRADE AND COMMERCE

Responsible Officer: F. Chambers, ADM,
Policy Planning

Date: May 10, 1977

Persons Interviewed: Ted Roseman,
Economist, Policy Analysis

Bruno Goulet,
Economist, Macro-Economic Analysis

The main focus of futures research at ITC had been in the Office of Science and Technology but since the death of Brian Tucker that emphasis has been eliminated at OST. The main focus of futures-related research at ITC has now shifted to Fergus Chambers, ADM, Policy Planning, and his staff. This staff consists of an Economic Analysis Branch under Don Allen, General Director, and an Office of Policy Analysis under Gordon Ritchie, General Director. In these branches, such futures-related work as a long-term industrial sector strategy, and an analysis of industrial incentives with their medium- and long-term impacts are being formulated. It is also here, under Fergus Chambers, that the Canadian Explor Model is being developed which will be utilized to forecast Canadian trade relationships. This is a major futures effort involving approximately four man-years. On the industry side of ITC, which will also use the Explor Model, emphasis is being given to planning large "turn key" projects with a long planning period, such as railroads, subways, airports, irrigation and power projects, in international markets.

ITC, as other departments, was reluctant to divulge specific costs attached to these activities.

PROJECTS

Explor

Explor is an input/output model with coefficient projections for 68 sectors which are analysed by ITC line branches for their reasonableness. The main thrust of the model has been towards international trade with a view to the Multi-Lateral Trade Negotiations. Specifically, Explor will examine the effect of energy price fluctuations on trade, an examination of the future industrial structure for the OECD working group on future industrial structure, and an examination of demand in the freight sector in conjunction with MOT and CTC.

Enterprise Canada

Enterprise Canada is primarily a PR project to assess businessmen's views as to the long- and medium-term objectives of the industrial structure. This project takes the form of interview teams which are being sent across the country.

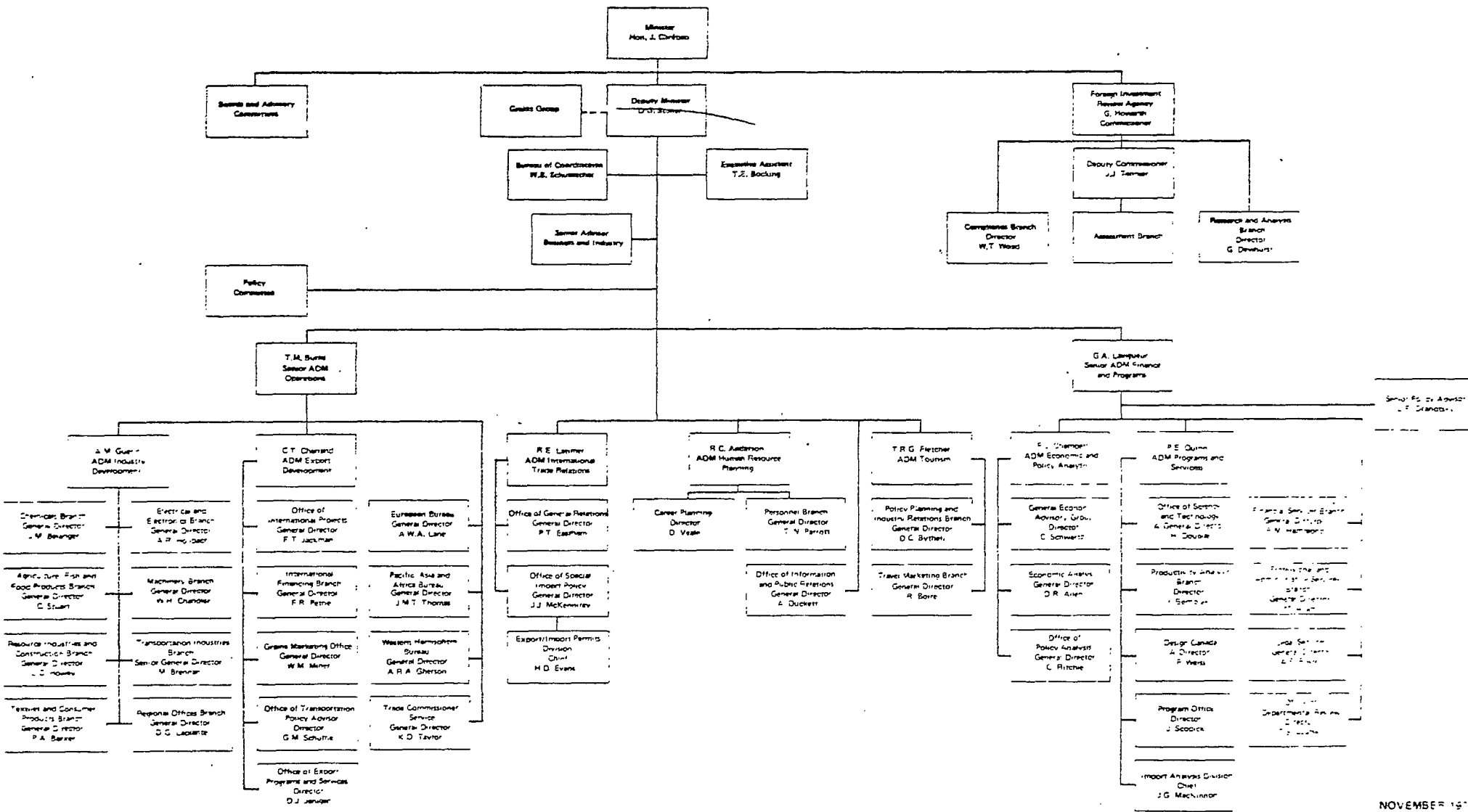
Small Business Plan

The Small Business Secretariat is preparing an action plan, the results of which will be available in a few weeks.

Future of the Quebec Industrial Structure

There is work in preparation on the future of the Quebec industrial structure for Paul Telliers group.

DEPARTMENT OF INDUSTRY, TRADE & COMMERCE



INDUSTRY BRANCH

ADM Economic and
Policy Analysis
(Fergus Chambers)

DG Policy Analysis
(Gordon Ritchie)

DG Economic Analysis
(Don Allen)

Dir. Policy Planning
(G. Gibbs)

Dir. Policy Environment
(A. Coll)

Dir. Economic
Intelligence
(C. Wennas)

Dir. Micro-Economic
Structural Analysis
(D. Buxton)

Dir. Macro-Economic
Structural Analysis
(B. Gould)

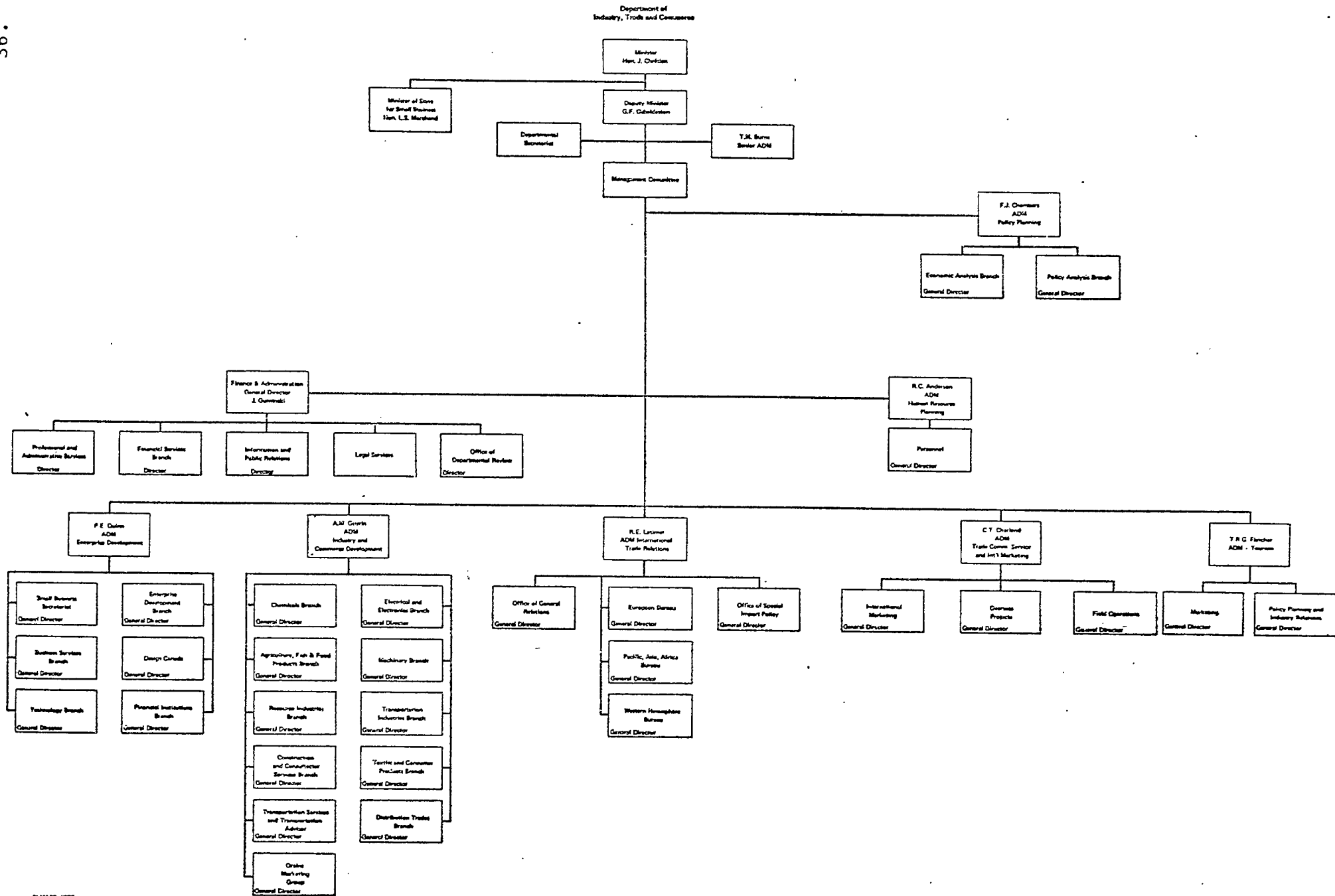
- Impact of MTM
- Productivity Study
- Sector Action Plans

- AIB Corporate Liquidity
- Investment
- Tax Policy
- Inflation Accounting
- Competition Policy
- Liaison with Industry
- Patent Law Revision

- Current Economic Analysis (short-term)

- Micro and Sectoral Studies
- Social Opportunity Cost of Labour (i.e. inter-sectoral reallocation of resources)
- Some Program Evaluation

- Development Explorer Model (DEM)
- *- CEM long-run projections and MTM impact study
- Candidate work
- Future industry structure w/ OECD
- Forest production studies
- Energy work



FUTURES UPDATE

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

Responsible Officer: R. Zagorin,
Director, Programs.

Date: April 26, 1977

Person Interviewed: M.S. Rao, Associate Director (Economics),
Social Science and Human Resources Program.

Projects

Two projects fall in the area of futures - long-range planning studies:

- 1) The International Food Policy Research Institute (IFPRI) "Project".
- 2) The Science and Technology Policy Instruments (STPI) Project.

Another one was completed last year: the "Latin American World Model" produced by the "Fundacion Bariloche", Buenos Aires, Argentina.

Budget

The two IDRC long-term on-going projects are funded partially by IDRC, but these grants are always a high proportion of the total funding.

In the case of IFPRI, the IDRC grant was \$2¼ millions for the three year period 1975-78 and was representing 60% of total funding. The Ford and Rockefeller foundation were supplying each 20%. The three partners created IFPRI which started its operation in

August 1975 with a very small staff. IFPRI does not have an endowment fund. The contribution made by the three groups are for operational expenditures.

For the STPI Project, IDRC grant accounts for 50% of the total cost of \$2 millions. The contribution was approved in 1973. The other partners are the developing countries (35%) and OAS (Organization of American States), 15%.

Significance for Federal Planning

Only the first project is in some way directly connected to planning in the Canadian government.

As IFPRI focuses on food grain, its activity is of great interest to Canada, the second world exporter of wheat.

IFPRI director, Dale Hateray (now ADM at U.S.D.A.) came twice here and had meetings with Canadian Government senior officials in Agriculture (Anderson), ITC (Grains Group), the Canadian Wheat Board and some Parleментарians.

This kind of travel and contacts with policy and decision-makers of exporting and importing countries is a regular activity of IFPRI staff. Of course, the other activity is research and publication of results. So far they have published three reports (on International Trade, nutrition and food deficit countries). An update and a 5 year extension of the 10 year projections made for food deficit countries is presently in print.

The STPI Project could be very indirectly of some value to Canadian planning in as much as the results achieved in influencing S & T policies in developing countries could be transferred to our own S & T policy.

FUTURES UPDATE

DEPARTMENT OF NATIONAL DEFENCE

Responsible Officer: Pat Black,
ADM (Policy)

Date: June 23, 1977

Persons Interviewed: F. Walden, Director,
Socio-Economic Strategic Planning,
Policy Planning Branch.

B. Thillaye, Director,
Strategic Policy Planning,
Policy Planning Branch

There are four groups within the Department which are responsible for conducting futures studies:

1. the Policy Planning Branch of the Policy Group, which reports to senior management through the Assistant Deputy Minister (Policy);
2. the Operational Research and Analysis Establishment, which is responsive to tasking from all parts of the Department and is placed administratively under the Assistant Deputy Minister (Policy);
3. the Plans Branch of the Defence Research Board, which advises the Minister of National Defence on all matters relating to defence science and technology; and
4. the Intelligence and Security Division, which reports through the Vice-Chief of the Defence Staff.

Only one group -- the Policy Planning branch within the Policy Group -- can be said to have primary responsibility for both

futures studies and futures planning, i.e., where futures studies are carried out and where the results of these studies are then specifically applied to and integrated into the long-range defence policy planning process. Indeed, DND has remained quite unique among departments in regard to this futures planning effort -- be it in spheres of international or domestic policy. The Plans Branch of the Defence Research Board has a partial or subsidiary mandate in this area of futures planning, in that it carries out futures studies related to defence science and technology and then integrates the results into the long-range planning process for defence research and development.

The information supplied, in this present phase 2 report, by officials of the first group -- which clearly conducts the most significant work currently within DND in the area of futures studies -- coincided very strongly with that supplied in the response to the original survey, suggesting consistency in DND's planning and organization of its key futures effort.

The Strategic Assessment Team of the Policy Planning Branch has continued to have the responsibility, inter alia, for developing and periodically modifying a departmentally-approved strategic world outlook to the year 2000, with particular reference to those military, political scientific, technological and socioeconomic considerations which are relevant to national and international security and hence will affect the formulation of Canadian defence policy. The basic purpose of this continuing exercise -- PROJECT 2000 -- is to assist

long-range planning in the Department by anticipating future developments in the international system which could affect, directly or indirectly, the security of Canada. More specifically, this strategic world outlook is to be used:

- a. to test the continuing validity of the strategic postulates on which current defence policy is based;
- b. to confirm or negate current departmental strategic objectives; and
- c. to formulate revised or new objectives for the 1980's and beyond.

Work was completed in 1976 on the first phase of PROJECT 2000, in which an attempt was made to forecast the occurrence of conditions and developments which could result in serious instability in the international system over the next ten years. Attention has been concentrated in this initial assessment (STRESS 1985) on conditions and developments which could lead to the use, or the threat of use, of military force in those areas of the world which are relevant to the security and strategic interests of Canada. More specifically, the analysis has sought to:

- a. assess the potential for occurrence of significant international conflict and instability;
- b. identify the conditions which could cause or precede this conflict and instability;

- c. estimate, where possible, the probability of occurrence of disturbances of sufficient magnitude to upset the international system;
- d. visualize the nature and form of these disturbances; and
- e. consider the implications of these developments for Canadian security and strategic interests in general, and for Canadian defence planning in particular.

STRESS 1985 was completed in August of 1976 and distributed within and outside the Department as the official long-range policy planning document. Special emphasis was given to feed-back coming from the most senior officials (usually DM's) of PCO, External Affairs and Treasury Board. In general the document was very well received, especially as it represented the first product of a unique ongoing attempt in the federal government to forecast the development of the international system. This, of course, was taken as the document's frame of reference within which the issue of particular concern to DND -- the nature and probability of future international stability -- could be thoroughly explored.

Because of the uniqueness and importance of this document, a copy of its introduction and conclusions is appended to this report. Inclusion of the conclusions is designed to illustrate how a department of the federal government has succeeded, substantively, at least, within the scope of the document itself, to integrate futures studies into the departmental planning framework and clearly discern the major

policy implications of the project. The fact that this exercise is presently classified at the confidential level (with a CEO rider) suggests, however, the particular difficulty facing DND in discussing this effort as completely as it would wish. In consulting with the Secretariat for Futures Studies, DND has indicated that it is hopeful in being able to overcome this problem where its key effort in futures work is concerned, i.e., the long-range policy document -- STRESS 1985 -- may be declassified shortly.

DND has sought to address, organizationally as well, the problem of interfacing its futures effort with its department planning, particularly in the field of policy planning. This is reflected in the way the departmental organization parallels the nature of the process through which the futures effort is systematically envisaged as being incorporated into policy formulation/adjustment and capability planning.

The Policy Planning Branch of the Policy Group consists of essentially two sections, the Strategic Assessment Team, and the Planning Guidance Team. The former Team carries out or sponsors futures studies; it consists of seven policy analysts, three at director level, whose background includes expertise in political science, military affairs, international relations, economics, sociology, science and technology. The latter Team then attempts to apply and integrate the results of the futures studies into the policy planning process; it consists of three senior policy analysts, with a similar range of expertise. The efforts of the last group are

greatly facilitated -- indeed, made possible -- by the strongly policy-oriented nature of the output of the first group. The second group is now in the final stages of preparing a policy-guidance document, including a force-capabilities plan, on the basis of the Strategic Assessment Team's STRESS 1985 policy document.

The Policy Planning Branch is also participating extensively in NATO's prime long-range program-planning into the 1980's. In this instance, the basis upon which NATO program-planning is conducted is that of a sharply-focussed form of environmental forecasting, with projected Soviet military capabilities being the integral element to the environment. Both the Policy Planning Branch and the Plans Group of the Defence Research Board are actively involved in the NATO AGARD (Advisory Group for Aerospace Research and Development) study, a comprehensive attempt to project and direct the development of aerospace technology in the west for the balance of the 20th century.

Further to this, the DND Policy Planning Branch will be assuming a major role for the Canadian government in the east-west overview to the year 2000, a type of futures international meta-study, the idea of which was approved at the recent Western Summit in London, England. Details are not forthcoming at this point, because the basic parameters of the study, i.e., scope, fundamental assumptions, participants have yet to be finalized.

In support of all of these efforts, the DND Policy Planning

Branch intends to continue developing and revising the PROJECT 2000 framework so that it may continue to reflect the adjusting parameters of the international environment while serving as the analytic frame of reference for all of DND's long-range/futures concerns and efforts and for the government's interests in the future international system.

FUTURES UPDATE

NATIONAL RESEARCH COUNCIL

Responsible Officer: W.A. Cumming,
Vice-president, Administration

Date: July 5, 1977

Person Interviewed: W.H.C. Simmonds, Industrial Liaison
Industrial Programs Office

In general, the situation concerning futures studies has not materially changed since that reported to you in the NRC reply of 31 December, 1975.

NRC continues to perceive the need for forward-looking studies in relation to its research programs. The organization and management of such studies continue as previously described.

1. FUTURES STUDIES

In regard to specific futures studies, a report entitled 'Canadian Opportunities in Space' by Dr. P.A. Forsyth was presented to Council in 1976. It deals with the nature of research in space to be done and the resources required (Report of the President of NRC, 1976-77, p. 46).

NRC is participating in the Government's Panel on Energy Research and Development under the Department of Energy, Mines and Resources and in the work of the Energy Review Group through the NRC Energy Project Coordinator, Dr. E.P. Cockshutt. NRC has primary responsibility in the field of non-renewable energy and in fusion research (Report of the President 1976-77, p. 50, 52, 54).

In 1976, an ad hoc task force set up by the Research Branch, Department of Agriculture, and the Division of Biological Sciences, NRC, reported its study on 'Food Research 2000', which outlines requirements for food research from now till that time.

In 1977 an ad hoc task force comprising members from Agriculture, Environment, Health & Welfare, MRC and NRC, reported its findings on the immediate and future situation in the training of toxicologists and the needs for contract work and research in this field in Canada. A rapid increase in Canadian capabilities is becoming necessary as the result of changes in U.S. regulations regarding the release and use of potentially toxic substances and in the number and kind of such substances being found in the Canadian environment.

AGARD, the Advisory Group on Aerospace Research & Development, has carried out the first phase of AGARD Project 2000 at the request of the Military Committee of NATO. Phase II is currently under consideration. Mr. Frank Thurston, Director, National Aeronautical Establishment, is the current chairman of the National Delegates Board of AGARD; Mr. W.H.C. Simmonds, NRC, is the Canadian member on the Steering Committee for this project.

Mr. Simmonds was also invited to participate in the National Science Foundation's 'Project: Knowledge 2000' in 1976, and in the current study by the Office of Planning and Development, Quebec City, in their study, Quebec 1995. He also acted as a consultant for Professor Erwin Laszlo's report to the Club of Rome 'Goals for Mankind', and is the NRC representative on the Interdepartmental Committee on Futures Research.

Funding of Futures Studies

Contract for a study on the feasibility of solar heating in Canada placed with Professor Hollands of the Department of Mechanical Engineering, University of Waterloo, through the Waterloo Research Institute, 1975 - Nov. 1977, \$61,000 total.

Contract by the Division of Building Research, NRC, and the Nova Scotia Power Corporation (50:50) for a feasibility study on the possibilities for district heating in the City of Halifax, placed with Shawinigan Engineering, completed January 1977, \$100,000 total.

Futures Methodologies

In regard to futures methodologies, the need to differentiate between know-how, and know-why type questions has been made clearer, and a method of determining the potential direction of social change has been devised.

A book entitled 'Futures Research: New Directions' is being co-edited by W.H.C. Simmonds and will be published by Addison-Wesley Publishing Inc. in the spring of 1978.

Conclusion

The above indicates that NRC futures studies are normally made in the area of possible future directions for research. Such studies are conducted internally or by contract and in cooperation with departments, etc., with responsibilities in the same or related areas as required.

FUTURES UPDATE

DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

Responsible Officer: Mark Daniels, ADM,
Planning and Coordination.

Date: April 29, 1977

Person Interviewed: Mark Daniels, Analyst,
Economic Development Analysis Division,
Analysis & Liaison Branch

Three efforts could be termed futures or long-term oriented at DREE but two only are presently active.

"Candide-R", a regionalized Candide, has more or less been put on a shelf in 1976 when Germain Simard, its initiator, left. There were also major problems in the investment and migration blocks. That played a decisive role in the prematured "death" of the model.

In the summer of 1976, the Economic Development Analysis Division at DREE set up the "Regional Future Project". The aim of the project was to build a simple, flexible and highly manageable model that could produce sufficiently meaningful regional long-term projections of main demographic and economic aggregates. In short, the model generates output from demographic variables at the national level, whereas at the regional level, it generates population from economic variables. A status report was produced in July and presented projections up to the year 2001. In September, an update was made to incorporate the Conference Board in Canada's regional projections (the time horizon is still the same). The project has necessitated only $\frac{1}{2}$ man-year since its inception. This summer,

some revisions and update will be made.

The interesting feature of the model is that it is directly made for policy- and decision-makers. Only a few variables are interacting. The model is easily usable even directly by the regional and provincial offices. So the policy- and decision-makers may test directly certain assumptions and see the changes produced elsewhere ("What if?" questions). So far, the Atlantic and Québec offices have used the model. Also some scenarios were tried at the headquarters in Ottawa.

Another project, called "Regional Trends", has been connected with "Regional Futures" but they were looking at past trends that served to project future trends incorporated in "Regional Futures". Val Traversy in Ian Clark's Division (Policy Analysis) was in charge of "Regional Trends".

The other DREE long-term endeavour is the pre-evaluation studies done by Don Tate's Division (Program Evaluation). This will be the subject matter of another interview.

Person Interviewed: D.G. Tate, Director,
Program Evaluation Division.

Tate's Division is involved in pre-evaluation of projects that DREE could eventually support.

Usually, they must adopt a very long-term perspective in those evaluations that try to compare costs and benefits of projects

examined. They have for instance a 25 year horizon in the case of a steel mill project for Eastern Canada (it could take as long as ten years to put the plant into production and 15 more years to reach full profitability). In another case, the forest industry, they are using even a longer time horizon (trees need from 30 to 40 years to get to maturity).

For their evaluations, they have to undertake sectoral analysis, but they also researched topics like the social discount rate, the social opportunity cost of labour (in some areas) and foreign exchange and investment problems.

With a staff of 30 people, it is difficult to study in depth each project envisaged. They usually look at five to ten projects at the same time. Their sample comprises big projects especially (but not exclusively) and projects in different sectors and provinces.

The results of these studies are sent to the ADM Planning and Coordination, often to the DM and even to the Minister. Of course, the projects studies could be very sensitive from a political standpoint.

FUTURES UPDATE

MINISTRY OF TRANSPORT

Responsible Officer: David Kirkwood,
Senior ADM (Planning and Development)

Date: June 30, 1977

Person Interviewed: Richard Clark, Study Director,
"Role of the Automobile in Canada".

The part of Transport Canada which is most closely involved in futures research is the Strategic Planning Branch, headed by Nick Mulder, ADM Strategic Planning, who is responsible to David Kirkwood, Senior ADM, Planning and Development. Of the work ongoing in Mulder's group, clearly the most impressive futures effort is the special study on the future role of the automobile in Canada, headed by Richard Clark. Because of the integrality of this subject for Transport policy and because of its exemplary calibre as a futures study directed explicitly into a policy dimension (incorporating a planned interface with successive stages of the policy-making process), the auto futures study figures predominantly in this examination of MOT's futures efforts.

Clark's task force is not part of Mulder's Strategic Planning organization, but Clark's reporting point is Dick Wedge, Director General, Intermodal Passenger Section. The task force, comprising 2 full-time professionals, 2 full-time research assistants, 1 research consultant (from the new renamed Montreal TD Agency of MOT, and 3 secretaries, reports regularly to a special Transport

Canada steering committee established to oversee the direction and status of the study. The research/information support infrastructure of the study is very comprehensive embracing actively participating federal departments (EMR, Environment, ITC, Urban Affairs, and Finance), participating Transport Canada branches (Strategic Planning, Research & Development and Surface Administration) and other major contributors -- automobile manufacturers, Ontario MTC, major cities of Canada, Bell Canada, and DOC along with other federal departments. Outside contracting to provide professionally-reliable, specialized expertise is important to this infrastructure. Consultation with relevant provincial government departments is extensive, regular, and of special importance owing to the strong provincial role in the field of auto transportation.

The organization, then the status, of the study are briefly outlined below. Based on a carefully designed, comprehensive work program, the organization of the auto study is unquestionably unique and impressive. It is tempting to argue that other futures efforts in the federal government would benefit considerably if they were designed after this model or approach; however, it is becoming clear that no design, no matter how well constructed and successful in a given area of government policy, is universally applicable throughout the federal government.

The study objectives are 4:

1. To identify and assess present and future influences on the role of the automobile in Canada.

2. To identify and assess problems of national significance pertaining to the automobile.
3. To identify and assess possible future roles for the automobile.
4. To formulate and stimulate action on short, medium, and long-term strategies towards the automobile.

The most important analytic tool for the study is the scenario which is used pivotally in three senses -- to explore the reasonable range of possible future conditions for the automobile in Canada up to the year 2000; to illustrate and examine the interaction of the automobile with all significantly affected aspects of society; and to provide the basis on which strategies for affecting the role of the automobile in Canada can be formulated. The parameters or fundamental assumptions of each of the basic scenarios are extremely comprehensive -- social, economic, technological, environmental being prime. These parameters, identified as factors affecting the future role of the automobile are themselves the subject of intensive investigation; each factor requires a separate working paper. Thus, items such as demographic projections, economic forecasts, societal change, psychology of ownership and use, transport mode development, urban development, energy supply/demand/cost and auto technology upon this kind of examination yield a spectrum of possible futures individually. Sets of these possibilities are taken together as components, i.e. parameters, for a basic alternative future situation; they then

represent one set of environmental characteristics, i.e., a scenario within which the projected/preferred role of the automobile may be examined. Key descriptors of the role of the automobile are 3: auto miles travelled, vehicle specifications, and auto-related expenditures. A final phase of the actual scenario development is identifying the prime factors affected by the role of the automobile. Under the 3 dimensions of (A) transportation, (B) societal, and (C) physical, these are (A) passenger travel, transportation infrastructure, transportation investment, automobile technology, road and automobile safety; (B) socio-political implications, socio-economic characteristics, social equity, the automobile non-user; and (C) natural resource consumption, environment, and settlement patterns.

There are 5 basic scenarios; some of the most important assumptions in the case of each are specified below. The time horizon is 10-15 years, but Clark confided that the projections in many cases were extended to 25 years (to 2000 approximately) to ensure continuity of reliable shorter-term projections.

1. "Paralysis" -economic stagnations and rampant inflation; international economic growth slow; urban growth slow; national energy sources development delayed; imports and costs of energy increase sharply; political instability.

2. "Muddling Through" -economic growth -- 4%; unemployment down; moderate energy conservation; moderate improvements in fuel economy; auto technology; auto sales moderately up.
3. "1985 - The Turning Point" -strong federal role to manage energy situation projected to be radically changing as of 1985 (i.e., fast, sharp deterioration) economic slump by 15% after 1985, sharp drop in number of autos on road, survival/salvaging technologies for autos.
4. "Energy Conserving Society" -oil imports to nil by 2000, after increase to 40% in 1985; high priority -- environmental protection; steady economic growth and low unemployment.
5. "California" -renewed economic growth, decline in inflation, energy situation strong; requirement for urban development increases sharply, auto technology and sales revitalized.

By far the most effort has been devoted to the development of these five basic scenarios, since their role is pivotal in the study.

This is reflected in the costs of the project, with roughly 2/3 of the entire expenditure (approximately \$.75 million) assigned to this task.

The study procedure established at the outset has been followed successfully, with little slippage where time deadlines had been stipulated for completion of phases of the project. Basically, the initial set of scenarios were formulated in October, 1976. This preliminary formulation was undertaken in order to provide a preliminary structuring for the series of probes (i.e., general and specific forecasts) that were undertaken between October 1976 and January 1977. The revised scenarios represent the reformulation of the initial 8 scenarios to the scenarios outlined above that now reflect the information gathered in the forecasts and probes. The technical work in the study, i.e., production of all working papers -- for key parameters to the scenarios, -- for the actual scenarios, -- for trends of the interaction between automobile-characteristic factors and other functions (e.g., use of other transport modes) -- and for the derivative strategic assessments, is well underway. Special presentations at this time are being devised on 4 fronts -- internal Transport Canada, federal-provincial committees, other federal departments, and auto industry and associated interest groups to inform as to the nature and progress of the study and to discuss problems and alternative final directions which the study may assume, i.e., the precise

nature of the strategic assessments and the policy recommendations for consideration by federal/provincial governments.

The policy regarding distribution of working papers, as these in themselves constitute extensive research efforts, is to publish and distribute them all, subject to the riders "Not Approved Transport Canada Policy" and their success in meeting pre-determined quality standards. The scenarios, in themselves, (along with their information bases), according to Clark, have generated substantial interest within and especially outside of the federal government. A concrete example of the first is the importance the Department of Finance is currently attributing to the economic dimensions of the auto study, in using information derived from the scenarios as inputs into their own long-range efforts.

Expected completion of the auto study is October 1977. Depending on significant items such as the nature and extensiveness of the final report, and on unforeseeable discontinuities in the work program, this projected date is realizable according to Clark.

FUTURES UPDATE

TREASURY BOARD SECRETARIAT

Responsible Officers: R.H.J. Bower, Director
Effectiveness Evaluation Division

Date: April 1, 1977

Persons Interviewed: D. Woodward, Head
Futures Research and Forecasting

M. Moffat
Effectiveness Evaluation Division

H. Duff, Policy Analyst
Effectiveness Evaluation Division

The Treasury Board Secretariat, until recently, had two centres interested in futures studies: one in the Planning Branch, the other in the Personnel Policy Branch. Of these two the Personnel Policy Branch was by far the most active.

Futures research in the Personnel Policy Branch was conducted almost entirely by D. Woodward. Reports published by him include: "A Futures Report to Aid Long-Term Strategic Planning in the Personnel Policy Branch"; "Personnel Management in the 1980's"; "The Quality of Working Life Concept and Implications for Personnel Policy"; and "Towards the Future". These reports and other advisory material provided the management of the branch with an excellent introduction to futures research along with many insights as to its application to personnel management.

Funding for studies dwindled until only Mr. Woodward's salary remained. He has since left TBS and futures studies are no longer conducted in the Personnel Policy Branch.

While the Planning Branch does not have a section devoted to futures research, it is interested in this area for a number of reasons: (a) many branch studies have long-term implications; (b) the branch has a responsibility for overseeing government planning generally, including futures research; and (c) most members of the branch have a professional interest in long-term studies.

Studies conducted in the Planning Branch tend to be very specific, concentrating on the year-to-year operations of government programs. They are present-oriented but are often geared to problems that are structural by nature. They therefore have strong future implications. Examples of such projects are: negative income tax; social security design; guaranteed annual income; and various tax credit systems.

Interest in futures as a part of government planning has always been present in the Planning Branch but has been strengthened with the formation of a proto-secretariat for the Coordinating Committee on Evaluation and Planning (CCEP). This group has been closely associated with MOSST in the latter's survey of futures studies activities in the government. It's main interest is in rationalizing the government's long-term planning procedures.

THE PURPOSE AND EVALUATION OF FUTURES STUDIES IN THE FEDERAL GOVERNMENT

The complete theory underlying the purpose and evaluation of futures work in the federal government is outlined in Volume II. The propositions below encapsulate the main ideas of the theory.

The Purpose and Utility of Futures Studies in the Government

The utility of futures work, conducted within the federal government, to the government must be assessed in terms of:

1. the Relevance of futures work to the government;
2. the Reliability of futures work in the government; and
3. the Utilization of futures work by the government.

The relevance of futures work to the government represents the potential usefulness which this kind of work could have for the government's efforts.

The reliability of futures work in the government denotes the quality of the production and presentation of that work, as well as the quality of the product itself, as assessed against qualitative and quantitative research criteria.

The utilization of futures work by the government represents the actual use to which futures work is put in the government.

The Evaluation of Futures Work in the Government

Evaluation is necessary in order to determine whether futures work is being productive in the federal government, particularly in terms of improving policy planning and decision-making in this context; it is also necessary in order to provide insight into why futures work is or is not being effective in this regard.

The formulation of explicit criteria affords analytic precision, maximizes the objectivity of the process, and provides a comprehensive matrix of standards against which all futures work in government, regardless of orientation, can be systematically reviewed and comparatively assessed.

Three sets of criteria for evaluating futures work in the federal government are proposed, corresponding to the three dimensions of reliability, relevance, and utilization outlined above:

1. Relevance Criteria

Seven desirable functions for futures work in the federal government are developed in the theory section on the relevance of futures work to the government. These constitute the first set of evaluative criteria gauging the relevance of particular futures studies in the federal government to the government. To the extent that futures studies in the federal government satisfy these criteria, they will be capable of performing desirable functions for the government, and will be invaluable to government planning, especially policy planning.

2. Reliability Criteria

The second set of evaluative criteria gauge the reliability of particular futures studies in the government. To the extent that futures studies in the federal government satisfy these criteria, they will be reliable as assessed in terms of professional research standards. These evaluative criteria constitute the "quality control" or "quality assurance" for futures work in the government.

3. Utilization Criteria

The third set of evaluative criteria estimates the actual use of futures work by the federal government. To the extent that the following utilization criteria are met by individual departments, then futures work can be said to be effectively utilized in this environment. The necessity of establishing a separate set of criteria here warrants reiteration; futures works that have successfully "cleared" the requirements stipulated by the two preceding sets of criteria for relevance and reliability are by no means guaranteed to be incorporated in the government's work. Accordingly, it is imperative to identify what sorts of futures work are being utilized by government, what parts of the government are utilizing them, and how effectively they are being utilized.

The Evaluation Exercise:
Application of Evaluative Criteria to Departmental Futures Efforts

1. Communications
2. National Defence
3. Transport

DEPARTMENT OF COMMUNICATIONSA. RELEVANCE CRITERIA1. General Projection Function

DOC has performed this function effectively where its futures effort is concerned. Projection of the future general communication environment in the 15-25 year time frame (i.e. up to 2000) has been the subject of a number of documents, initiated at the outset of the department (which is only 7 years old) with the Telecommission large-scale inquiry into public telecommunications, though by DOC's own admission this first effort was "futures sensitive" but not futures research. A large-scale study on computer communications looked at mid-term futures in computer applications and services and their impacts on communications. A study of public telecommunications in terms of inter-regional traffic expectations by correlating public carriers facilities planning and traffic engineering forecasts with household projection and economic activity projections. In the overall structure of communications, the two documents "Perspectives 1985" and "Threats and Opportunities in the Development of Canadian Public Telecommunications in the Next Decade" represent a comprehensive effort to ascertain the dynamics and long-term directions of the field and to explore the R&D priorities in Canadian public telecommunications development.

2. Early Warning Function

DOC has also performed this function effectively. Identification of imminent problems in the public telecommunications field has been attempted in many of the items outlined above. Identification of the emerging dichotomy between rural and urban

Thus while the interface between DOC's futures efforts and the policy process was not systematically charted, it was accomplished through an "osmosis" process somewhat unique to DOC. DOC has also gone a long way in developing comprehensive long-term policy objectives for Canadian telecommunications, i.e. development and promotion of quality of service for rural telecommunications sector comparable to that in the urban sector at economically feasible rates; provision of good-quality services for the North; the separation between "content and container" or "message and medium" as a socio-cultural imperative; the rationalization of delivery facilities as a techno-economic imperative; and the rehabilitation and rationalization of the terminal sector with subscriber facilities as a service imperative.

4. Role in Policy Development

Development of DOC's futures effort has not been directed to, or resulted in, the formulation of strategies for Canadian telecommunications policy to 2000. Development of contingency plans depending on the way future situations actually emerge has not been neglected but neither has it been pronounced. DOC scores higher in the sub-function of opportunity planning in terms of identifying important initiatives for the government in the telecommunications sector. These are done explicitly in the aspects of messages, content and programming, of delivery, and of terminal facilities and services in the telecommunications field. None of this work has developed, or has been accepted, to the point that comprehensive strategic planning is possible for DOC.

Canadian communications sectors and, in particular, the projection of over-investment and inter-carrier conflict potentially arising from the development of the urban sector, are good examples. The extending influence of the U.S. in Canadian telecommunications, the projected "shake-down" in the Canadian commercial broadcasting industry, and increased domination of the subscriber terminal sector by Japanese and American corporations are further examples. Particular effort has also been devoted to the potential crisis that could emerge if these industries controlling Canadian telecommunications distribution systems were also allowed to produce or manage the content handled within those systems.

3. Role in Strategic Planning

When basic decisions were about to be taken several years ago as to the desired directions of Canadian telecommunications policy, DOC identified some of the basic policy options open to the government, traced through the consequences of each of them, weighing overall advantages/disadvantages, and subsequently recommending the preferred policy option. For example, one major policy option was to induce competition in the Canadian telecommunications sector -- as in the U.S.A. -- and to encourage free enterprise to act as the basis for provision of public services. Projected consequences of this option over the 10-15 year time frame indicated that a monopolistic situation headed by IBM could easily have developed, and a highly non-preferred situation was thus clarified. Other options, including opting for non-private, publicly-accessible line systems were fully investigated, and subsequently this policy option was recommended for adoption.

5. Role in Goal and Value Definition

DOC's work is exemplary here. The very process by which the DOC futures effort is conducted, plus the nature of the subject of communications lend themselves to the performance of this kind of role of futures in government. Considerable thought, for instance, has been directed at the first order questions -- What is the role of communications in society? What could it be? What should it be? What are desirable, realizable goals for communications in Canadian society? and second order questions -- Is society a captive of its communications infrastructure to the extent that it is inhibited in adapting to changing realities? Is approximately 40-50% of our GNP poured into all forms of communication too much? The long-term effects? The present and future opportunity costs? Although this extensive scrutinization is not officially-designated policy investigation, it does focus sharply on the very rationale of DOC and the whole future Canadian telecommunications sector.

6. Role in Resource Planning

Also performed well. One mode of this function is to juxtapose anticipated future requirements with existing technologies or new technologies "over the horizon" which can be developed. Thus projecting the effects into the future of new technologies, such as satellite communications, is an important feature of DOC's futures effort. Another mode, involving the conceptualization of plans for developing new technologies, was realized through the Anik satellite program which has already effected "desired" futures for

Canada's North. Such a program went as far as generating new demands and expectations, but also cultural stresses.

B. RELIABILITY CRITERIA

DOC's futures work is not structured or developed in a way which facilitates application of the reliability criteria. It is clear that DOC's futures work can be judged reliable, if it is seen and presented as systematic conjecture about the future of the communications sector in Canada. While the work is supported in places with the use of a number of futures techniques such as statistical extrapolations, an explicit research design is not fully developed. This in itself by no means disqualifies DOC's effort from being reliable, but it does limit the replicability of the effort, and in particular, inhibits the verification of the more general conclusions inferred from the analysis. The articulation of a research design would enhance the clarity of the analytic process used; while the argumentation involved in the latest product of DOC's futures effort is commendably stimulating, and reflects considerable imagination and perspicacity on the part of the author, the argumentation could be more tightly structured so as to yield sharper conclusions. Further, much more effort could be devoted to systematically identifying the specific implications of the analysis for the particular policies and objectives of the government in Communications. Areas in the communications field which require more extensive futures research should also be highlighted. DOC should be credited with pointing out the limitations inherent in futures work, or more precisely,

inherent in approaching the future of the communications sector in Canada.

C. UTILIZATION CRITERIA

Efforts to examine the interface of futures studies and departmental planning and the alternative institutional options to effect this interface has been very limited. This has not, somewhat surprisingly, precluded DOC from coming up with a process that is suited to its needs and ensures that policy documents are "futures sensitized" at a minimum. But it does mean that careful examinations of the design of futures studies and the design of the interface between futures studies and the policy framework has not been conducted, so that the ultimate goal of ensuring that futures studies be conducted so as to maximize their contribution to departmental planning is still eluding DOC.

NATIONAL DEFENCEA. RELEVANCE CRITERIA1. General Projection Function

DND's futures studies excel in the projection function. The Policy Group's Strategic Assessment to 1985 -- STRESS 1985 -- is a governmentally-unique effort to systematically forecast and review the development of the international system. This is done at two levels -- projecting the development of the overall international system in its political, economic, scientific-technological and military spheres, and in the more focussed sense of forecasting continuities and changes in the international security sub-system, identifying implications of these more precise trends for international instability and conflict. Linkages between developments in the domestic (Canadian and other national) situations and the international environment are carefully investigated. Macro-issues, i.e. those of a distinctly global nature, of special importance to the direction of the international system, are isolated, analysed, and incorporated into the general and specific projections. PROJECT 2000 -- the conceptual framework and meta-research design for the derivative policy exercise and document -- STRESS 1985 -- guides the exploration of the development of the international system by resolving the system into its key components -- in the geographical dimension -- regional sub-systems, major conflict zones (actual and potential) and in the issue dimension -- macro-issues (e.g. arms trade, nuclear proliferation, development of the seas) and by focussing the inquiry within each on the conditions likely to precede and produce international instability and ultimately conflict. These sets of conditions are

inter-related and progressively telescoped to provide an assessment of the ways (areas and times) by which the international system will be most susceptible to disruption; the implications of this for Canadian security are then calculated. Exploration of potential new technologies and their impact on the political and military spheres is also a strong asset of DND's futures effort; ORAE and DRM Plans sections are instrumental in this area.

2. Early Warning Function

Performance in the early warning/alert function is also exemplary; much of this effort closely parallels that described for the projection function. Anticipation of international crisis, in more than the narrowly-defined military sense, is a prime objective of the STRESS 1985 effort. Projecting tension levels in the future international system, gauging critical interaction paths (as in the case of future super power competition, especially in the nuclear and conventional arms race) and monitoring developments in specifically-isolated conflict zones in the world are three facets to this task. Interpolation of catalytic, intervening variables is another sub-function in this area conducted well by DND; hypothesizing the acquisition of nuclear weapons by terrorists, aggressive military regimes and calculating the likely effects on regional and international stability is a good example.

3. Role in Policy Development

The policy function is developed well by DND. The following sub-functions are performed effectively:

- Identification of consequences of present policies and programs.
 - i.e. identification of appropriateness of present policies regarding sovereignty protection, NATO, NORAD and peacekeeping for future situations. Assessment of projected capabilities (force levels, weapons levels) against projected future requirements.
- Identification of significant policy-manipulatable variables.
 - e.g. controlling supply of nuclear resources to 3rd world countries controlling aspects of the international arms trade.
- Identification of preferred future conditions/situations.
 - e.g. nuclear arms control, balanced force reductions in Europe, CBW disarmament/arms control, creation of regional superpowers, e.g. Iran.
- Selection for negation, avoidance, or restriction purposes, of non-preferred situations capable of policy manipulation or influence.
 - e.g. denial of excessive potentially destabilizing preponderance of Soviet military strength in European theatre.
- Identification of alternative policy options.
 - e.g. possible exclusive reliance on U.S. for necessary military capabilities.
- Extrapolation of consequences/implications of selected policy options.
 - e.g. garrison-state situation plausible as result of policy option identified above.

'Specification of comprehensive long-term policy objectives.
 e.g. promotion of international stability -- and derivative
 -- avoidance of unilateral military actions de-
 stabilizing to international security and Western
 effort in that regard.

4. Role in Strategic Planning

DND has developed selected strategies for achievement of
 projected future policy objectives

e.g. Strategy of negotiation -- MBFR, CCD, UN negotiations
 Strategy of peacekeeping -- UN Peacekeeping Primarily
 Strategy of military contributions -- NATO Commitments
 Primarily

and has integrated them, on a preliminary basis, into a comprehensive
 strategic planning framework.

5. Role in Goal and Value Definition

Sub-functions here have not been thoroughly performed. Some
 work has been conducted into the continued importance of national
 security to societies and Canada, and that large military infra-
 structures will remain necessary for the foreseeable future (up to
 2000) if this goal is to be adequately met. An assessment of DND's
 futures effort in this regard is particularly difficult as their
 very raison d'être is premised upon the existence and achievement
 of one goal -- national security.

6. Role in Resource Planning

Performed effectively in 2 sub-functions.

*Projection of present capabilities, i.e. present weapons systems into future, i.e., life-span, future obsolescence.

*Projection of mobilizable potential for new resources and capabilities in the future especially in terms of new technologies that can be incorporated as weapons systems.

B. RELIABILITY CRITERIA

The overall assessment of DND's futures effort is that the reliability is very high. The futures products of the Policy Planning Group merit special mention. The Strategic Assessment to 1985 -- STRESS 1985 -- and PROJECT 2000 are strongest in the introductory and design phases. Considerable effort has been expended in developing a long-range framework for analysis and planning that draws upon the best theory in the field of futures research and international affairs. Limitations of futures research have been examined extensively in position papers that make up PROJECT 2000. The most promising opportunities for futures work in the areas of international relations and Canadian security have been explored. The design of PROJECT 2000 which is reflected in its policy derivative -- STRESS 1985 -- has been fully explicated. Its objectives, assumptions, time parameters, and methodology have all been clearly identified and these are continuously being reviewed. While the Policy Planning Branch's futures effort is also strong in the analysis and assessment/interpretation phases, more extensive empirical analysis needs to be

conducted and its linkage to the more generalized propositions needs to be clearly identified. Further, specification and rationalization of confidence-levels would enhance the reliability of the projections for the development of the international system. The concluding phase of this futures work is exemplary, especially where the implications of the forecasts for the policies and objectives of the department are explained.

C. UTILIZATION CRITERIA

DND's efforts here are commendable and exemplary. A careful examination has been undertaken of the interface between futures studies and departmental planning efforts, and the alternative institutional options for integrating the two have been thoroughly explored. Building the futures studies interface into successive stages of policy, strategic and capability planning and ensuring that the department's futures efforts are policy sensitive in terms of their objectives and frames of reference have both been instrumental in assuring the relevance and importance of futures studies to DND.

TRANSPORT CANADAA. RELEVANCE CRITERIA1. General Projection Function

In the overall futures effort of Transport Canada, i.e. in the Strategic Planning Branch, TDA, and the Auto Study, the projection function is performed well. The major work of the new renamed TDA, Transportation Development Agency in Montreal, "Alternative Environments for Canadian Transportation, 1980 - 2000", attempted to outline the future transportation environment for Canada and present several basic situations which could alternatively characterize this environment. The Auto Study, which is clearly TC's largest and most important futures effort at the present time, projects the future environment which will influence the role of the automobile and identifies the alternative possible future roles for the automobile. The scenario -- the key analytic tool -- for the Auto Study is used, in terms of this projection function, to explore the reasonable range of possible future conditions for the automobile in Canada up to the year 2000, and to illustrate and examine the interactions of the automobile with all significantly affected aspects of society.

2. Early Warning Function

The Auto Study is strong in this area. Alerting TC to possible critical future situations regarding the automobile in Canada is seen as one of its more important functions. Gasoline consumption, critical points, and implications for other travel modes, and levels of environmental damage are good examples. TDA appears to have addressed future problems in terms of long-range national requirements for the supply of transport.

3. Role in Policy Development

TC should be credited for performance here. Policy-salient issues are being addressed by their futures effort as with the Auto Study, as the future of the automobile is key to the future energy and economic situations and of course vice versa. Effects of transportation on the general economy and environment in the future have been investigated by TDA. In the Auto Study, parameters of each of the basic 5 scenarios, in effect, represent individual or combined policy options, i.e. postulated energy conservation for several of the scenarios. The effects of these parameters, as translatable via the implications of the scenario, are identified comprehensively. Limited work has been done on the development of preferred futures; more accurately, possibilities for desirable conditions have been explored in the general field of transportation. The development of broad, long-term policy objectives, as an additional part of this policy function of futures studies, has been attempted but not within the context of a specifically-constructed and analysed future environment.

4. Role in Strategic Planning

The development of selected strategies is another key function of the Auto Study, and within the confines of this particular study, is performed very well -- though Clark's group has yet to fully concentrate on this phase. In the general field where strategic planning maps out the general course and effects of government policy in the transportation field for the future, the requirement

exists to take into account, and manage through policy, the inter-relationships between the various travel modes/sectors over time. It does not appear, however, that the futures effort of TC has been developed to the point where it permits the formulation of a strategic framework for the future within which transportation policy for the different sectors and their interrelationships can be articulated.

5. Role in Goal and Value Definition

TDA's considerable effort to look at the value of transportation to society in the future and the relationship of transportation goals to society's priorities now and in the future is commendable. The "Mobility and Quality of Life" study title is itself an indication of the comprehensiveness and "objective detachment" characterizing this approach to investigate transportation in Canadian society. The study focusses on such aspects as efficiency, accessibility, and equity of transportation and balances these against the costs to society of this important sector (limited resources, capital, environmental damage, etc.).

6. Role in Resource Planning

Regarded in terms of a futures context and in terms of a general planning framework, this resource function has not been strongly developed by TC. In specific sectors, as with aviation facilities requirements in relation to future supply/demand conditions, this function is performed well. Certainly in terms of projecting possible effects of resources outside the government where particular

technologies are concerned (i.e. auto technologies), this function of futures is strong in a specific sense with TC.

B. RELIABILITY CRITERIA

The overall assessment is that the reliability of Transport Canada's futures effort -- notably that of the Auto Study -- is outstanding, emulated only by the futures work of National Defence. The shortcomings are few and do not substantially impair the reliability of the product. In the introductory phase, for instance, the limitations of scenario construction should be more explicitly acknowledged and examined. Examination of other futures work in the area of transportation could be attempted to help place this particular study in perspective. However, it is easier to credit the Auto Study, still in this introductory phase, for having clearly outlined assumptions underlying the exercise. The design and analysis phases are exceptionally strong -- virtually all of the specific reliability criteria established in the theory section of this overview are satisfied. The interpretation/assessment phase of the Auto Study could be enhanced by the specification of confidence levels for projected developments affecting, and affected by, the future of auto transport. While the Auto Study is not yet completed, it would seem at this point that it will easily meet the standards suggested for the concluding phase of futures research. Special emphasis should be placed on the Auto Study's carefully structured time program for conducting and completing specific phases of the research exercise. From this point of view, the Auto Study is exemplary and could well

be used as a model for similar futures research designs in the government.

C. UTILIZATION CRITERIA

It is not clear that TC has focussed with any perseverance on the interface between futures studies and their departmental planning efforts. What is clear is that a number of elements within their organization are performing futures studies quite well in their own respective areas, but the interrelationship between these and the ongoing examination of the overall transportation environment of the future is at the very least underdeveloped, at the worst, neglected. Re-organization of the areas involved in or related to TC's futures efforts has not resulted in a more carefully-planned interface and integration of futures studies and departmental planning.

IV THE SECRETARIAT FOR FUTURES STUDIES

The Secretariat for Futures Studies, Ministry of State for Science and Technology, was established in the Spring of 1976 and formally staffed with a new staff in the Spring of 1977 with the following terms of reference:

1. to be aware of all futures studies in the federal government, and to provide assistance and advice as requested, by summarizing cataloguing and identifying the scope of futures programs and activities;
2. to provide secretarial services to the Interdepartmental Committee on Futures Research by scheduling and arranging meetings, by taking and distributing the minutes, and by performing other duties requested by the Committee; and
3. to be the central contact point for general information purposes for persons and organizations outside the government.

In the few months of its operation, the Secretariat has completed a major analysis and summary of the Lamontagne survey of futures studies in Canada, which has been termed "excellent" by Senator Maurice Lamontagne and the Senate Special Committee on Science Policy, created a very successful series of continuing workshops which have been fully endorsed by the participants, among them many directors and general directors from throughout the federal government as having created a much needed dialogue on many futures oriented subjects. The Secretariat has also organized a Federal Advisory Group to the Canadian Input to the OECD Interfutures project which meets on a bimonthly basis.

The Secretariat has also created a series of monthly trends meetings where specific important trends are examined, such as the inflationary trend, energy supply and demand, demographic trends, food, etc. The Secretariat also played a major role in organizing the very successful second annual Canadian Association for Future Studies conference at Queen's University, Kingston, June 9-12, for which it was praised from many quarters. A modest and growing futures library and reference center has also been established in the Secretariat. The Secretariat will, towards the end of each calendar year, publish an annual Futures Review of the federal futures effort. We also seek to improve and extend, the technical capability and the scope of thinking of the federal futures community by arranging seminars and updating our previous publication on Futures Methodology. The Secretariat will continue to maintain a close relationship with private sector institutions, groups and individuals, and will also continue to assist the Canadian Association for Future Studies. In general, the Secretariat will continue to be an informal and formal contact point and focus, for advice and information upon futures studies.

V GENERAL OBSERVATIONS
REGARDING THE STATE OF FUTURES WORK IN GOVERNMENT

1. a. Futures studies (FS) is a process of thinking rather than anything approximating an exact science in terms of set formulae and physical laws. It is a process of rational thinking about the future.
 - b. There are still many competing definitions for research conducted on the subject of the future, although the term futures studies is most widely used in the general field, as well as in the federal government (i.e. as opposed to futuristics, futurology, futuribles, etc.). Futures research is used with nearly as much currency, and interchangeably with futures studies.
 - c. A generic definition, among the options, for FS in government is "Systematic research conducted into the future to identify alternative possible/probable and desirable situations to enable decision-making to yield the most preferred of realizable situations in the future".
2. A large variety and still increasing number of methods/techniques may be used with FS; reliability of each is a function of many factors. The particular subject-area to which each is applied, the technical skill with which they are applied, and the accuracy/completeness of the data used are prime, but by no means exhaustive, among these.
 3. Methods of quantitative and qualitative analysis are both useful and necessary for FS. Each is of limited value when

used on its own. In many instances not only are they mutually reinforcing when combined, but a synergistic effect can also be generated where complementarity is strong. Examples: Delphi technique and trend extrapolation; scenario construction and trend extrapolation.

4. FS is not discipline -- or technique -- bound. Both the multidisciplinary and interdisciplinary characteristics of the field are some of its most potent assets. The development of new techniques is virtually limitless, but the reliability of these varies considerably.
5. FS is applicable to many levels of analysis. Global, international, national, regional, and sub-regional (e.g. individuals) levels may all be examined productively.
6. FS is sufficiently adaptable to make both macro and micro analysis possible and useful. Macro-futures are subject to the same strictures as all high-level generalized investigations while micro-futures analysis presupposes precise, complete data, and its focus greatly limits its utility and demand.
7. FS is multi-functioned. This is particularly important in the federal government. Many functions have been suggested for FS, especially in the federal government context. These range from providing an early-warning function to decision-

makers of imminent problems and crises (this would be a minimal function) to providing a firm basis for constructing all medium- to long-term planning for the federal government (a maximal function).

8. While FS has not achieved the characteristics/nature of an academic discipline, it is clear that a certain kind of expertise is relevant/useful/necessary to the field. Additionally, the need exists for professionalism or professional guidelines so that the claims for the field, its concepts and techniques are not exaggerated to the point that this misrepresentation becomes counter-productive to the credibility of FS.
9. The 10-25 year time frame appears to be the most effective part of the future on which to focus in the federal government. This time period is usually described as the medium- to long-term future (i.e. Medium: 5-10 years; Long: 10-25 years; Very Long: 25 - Years).
10. Specific techniques of FS, while highly useful/reliable when applied to given subject areas, are as equally unreliable very often in other areas.

11. FS should not be used in excess of its potential.
The prediction of specific events and the projection of highly complex patterns of interaction between/among selected variables are examples of extremely difficult, unreliable exercises with questionable utility.
12. FS is both useful and necessary to departmental planning frameworks, and at the very least, sensitizing departmental planners to longer-range, comprehensive concerns.
13. FS in the federal government has been responsive to major policy issues affecting society. Indeed, FS has been largely responsible for clarifying and identifying candidates for social issues. The environment, and supply/demand distribution of natural resources are two cases in point.
14. Certain problems/policies/types of planning in the federal government cannot be profitably approached through FS, and indeed resist this kind of treatment. Short-term evaluation and planning, short-term program "forecasting", and budgetary/financial considerations figure here.
15. FS can frequently be (and are) accommodated in other forms of long-range oriented efforts being conducted by departments. In these instances, accordingly, the nature of output must be recognized as being considerably different from that achieved

where FS activities are more highly compartmentalized in the federal government. Strategic planning is an example here.

16. FS and long-range planning are not synonymous; neither are they mutually exclusive. Precise definitions, while controversial, are being developed by the Secretariat. Both have a common characteristic in that they represent a way of systematically thinking ahead. FS is a prerequisite to effective long-range planning; the latter can generate highly useful feedback into the conduct of FS. Both FS and long-range planning are mutually reinforcing. In fact, this feature is essential to ensuring the usefulness of FS in the federal government.
17. FS can and should be integrated into the decision/planning process at senior management levels without being in a highly jargonized, technical form. The value of FS can be retained in this manner; resistance to adapting even technical specialized FS in this way will quickly undermine the credibility of FS as an important vehicle in long-range planning.
18. FS efforts in the federal government can be enhanced through interdepartmental consultation, with the Interdepartmental Committee on Futures Research (ICFR)

acting as a principal vehicle for this activity.

19. A permanent operation, such as the Secretariat for Futures Studies (SFS), is essential to keep the field moving in the federal government, especially where it both develops and catalyzes innovations in the field and ensures the continuous exploitation of the potential in the government for futures studies.
20. Ongoing self-evaluation is a vital process to ensure that best directions/opportunities in FS are explored, particularly since government can assume the initiative for translation of FS into policy decisions and plans.
21. Extra-governmental links in both the national and international environment are particularly important to the success of FS in particular policy areas. These links can run the full spectrum -- i.e. information acquisition, communication, consultation, co-ordination, contracting. There is no one source of FS expertise in the extra-governmental environment which can provide reliable advice of FS to all of the relevant futures groups in the federal government. This is due primarily to 1) the scope of the work of a particular extra-governmental futures entity (i.e. university, private institute) is not sufficiently comprehensive to cover the information needs of the federal government futures groups as a whole and/or 2) the

perceived reliability of the product or service of the extra-governmental futures entity is sufficiently unclear or questionable to deter excessive reliance on this work and to encourage recourse to alternative futures information and research from outside the government.

