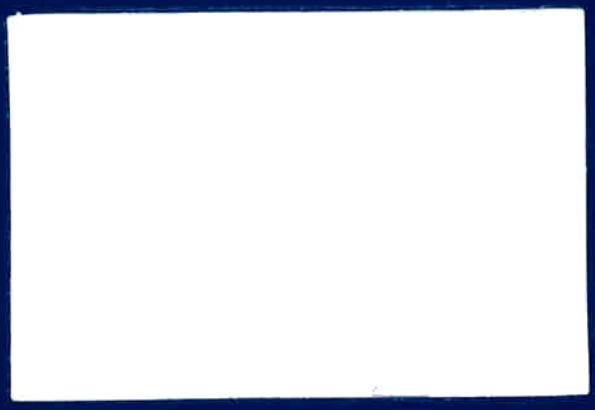
Energy, Mines and Resources Canada
Office of Energy Research and Development

Énergie, Mines et Ressources Canada
Bureau de recherche et de développement énergétiques



Canada

EVALUATIONS OF ENERGY R&D PROGRAMS MANAGED BY DEPARTMENTS OF THE GOVERNMENT OF CANADA

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CONTENTS

OVERVIEW

Energy R&D projects are developed in concert with A-base projects and are subject to the same rigorous review. It is the policy of the interdepartmental Panel on Energy Research and Development (PERD), in keeping with respect for Ministers' prerogatives, that departments monitor and arrange for evaluations of the rationale and effectiveness of the energy R&D for which their Ministers are accountable to Parliament. Such evaluations follow the requirements of the Office of the Comptroller-General. Internal Audit Groups evaluate management and efficiency in delivering programs. Annual line-management project reviews involve consultation with other government departments and the private sector for relevance and peer review for technical merit and performance. Annual department-wide evaluations of research priorities take account of advice to Ministers from review committees of the private and academic sectors and provincial governments. Energy R&D is assessed as a component of each department's Annual Science and Technology Plan (ASTP). It is also summarised in EMR's ASTP to demonstrate EMR's policy leadership and the Panel's coordination role.

Energy R&D programs are also reviewed using "deliverables" as a technical audit tool. Deliverables provide a basis from which the Panel and its coordination structure can assess progress and achievements to be reported when seeking renewal of program approval. Committees have been using them as a checklist to enable more rigorous project review. Departments and industry, who use information from these energy R&D programs, have appreciated the value of deliverables as providing in short-form a sufficient technical overview for them to pursue information transfer and participate in program development. Managing departments have begun using the deliverables as an internal management and review mechanism. The Office of Energy R&D is using this progress report to identify completions to be elaborated further in the next report on benefits from the Program. Many modifications have been made to deliverables of the energy R&D Program to make their delivery more realistic, their content more specific and their review in committees easier. These modifications with the summary of progress are described in the "1987 Progress Report on Deliverables of the Energy Research and Development Program Administered by the Interdepartmental Panel on Energy R&D, OERD 87-04". The revised deliverables will also be listed in the next "Energy R&D 5-Year Plan of the Government of Canada" to be completed after program approval in 1988.

In 1983, the Auditor General, in his review of PERD, suggested that more use be made of outside experts in the process of reviewing and assessing the effectiveness of energy R&D Tasks and Programs. As a consequence, OERD was asked to collect information from departments on their use of such outside experts in this area. The Office also started using outside experts to provide a peer review of the activities on the basis of one Task per annum.

In November 1987, after discussion with Central Agencies on evaluations of the energy R&D Program, the Chairman of the Panel requested from each Member of departments managing energy R&D to update the 1983 review mechanism list.

This updated document covers a wide range of internal and external managerial and technical evaluations to which energy R&D is subjected, directly and indirectly, some involving external Advisory Committees reporting directly to Ministers. The document lists over 130 committees, advisory boards and other review mechanisms of which at least 100 have external input such as from industry, industry associations, other departments, academia and/or provincial governments.

HOW TO USE THE DOCUMENT

The first section of the document describes in a general fashion PERD review and consultation mechanisms in each Task, along with tables listing the participating departments for each Program. The second section enumerates the departmental evaluations in alphabetical order.

A reader may find a specific program by refering to the Task tables in the first section of this document. Departments participating in the particular program are cross-referenced in these tables to the second section of this document.

Acronyms found in this document are explained at the end.

EVALUATION MECHANISMS OF THE PANEL ON ENERGY R&D

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INTRODUCTION

The first level of review and evaluation for the energy R&D program is recognized to be at the senior committee level ("the Panel") of the interdepartmental **Panel** on Energy R&D whose responsibility is to provide overall direction for energy R&D of the Government of Canada. The Panel is comprised of senior representatives of science and technology branches of participating departments and agencies together with representatives of central agencies (Finance, Science and Technology, and Treasury Board). It is chaired by the Assistant Deputy Minister, Mineral and Energy Technology, Energy, Mines and Resources.

The Panel recommends to the Minister of EMR, a package of R&D with appropriate resource allocations to participating departments. After approval from the Government and Treasury Board, resources are placed in the Main Estimates of the participating departments who are responsible for their part of the Program.

The Panel has a central policy and planning role which requires it to identify new opportunities, terminate completed programs and assess strategy and priorities in the light of changing energy policy objectives and changes in the Canadian and international situation. It is also responsible for reviewing and coordinating the Program and recommending allocation of resources within the Program.

An ongoing technical audit process has been initiated, using "deliverables" to provide a basis for the Panel and its hierachy of coordinating committees to assess progress and to report achievements when seeking program renewal. The latest status of "deliverables" is available as the "1987 Progress Report of Deliverables of the Energy Research and Development Program Administered by the Interdepartmental Panel on Energy R&D, OERD 87-04". Deliverables are also listed in the Panel's "5-Year Plan", to be revised after program approval in 1988.

In response to recommendations of the Auditor General in his report of 1983, periodic evaluations of major technical areas are also now contracted-out. These technical areas correspond to six of the seven Tasks into which the Panel has organized the Program.

TASK 1: ENERGY CONSERVATION

The energy conservation task is organized in four sectoral programs (Industry, Agrifood, Buildings and Transportation) and two trans-sectoral programs (Industrial Energy R&D and Energy Systems). The work is managed by nine departments and agencies of the Government of Canada with the majority contracted out to the private sector.

Consultation takes place formally in extramural and intramural modes (Table 1). Each program is coordinated by an interdepartmental program committee of the Panel, made up of members of the participating departments and OERD, in which extensive consultation takes place. Each department has an external review committee made up of private sector, university and other representatives which review the conservation R&D as part of the department's overall R&D program. In addition informal consultation takes place regularly between the government scientists and program managers and their counterparts in the provinces, universities and the private sector.

Many energy R&D projects are closely planned and, in many cases, co-funded with industry, with the base budgets of several departments, and with support programs such as the Unsolicited Proposals Program (UPP) of Supply and Services Canada.

International consultation takes place through the Working Party on Energy End Use Technology of the IEA and the Executive Committees of the Implementing Agreements in which Canada is involved and informally through contacts by scientists at seminars, conferences and workshops.

Participation by OERD in the CEA, NSERC and ACERRF ensures that government work is complementary and that duplication is minimized.

Furthermore, the Panel has conducted in 1986 a major contracted-out review of Task 1 activities as part of the periodic evaluations recommended by the Auditor General.

Policy advice to the Task is provided through the Office of Energy Research and Development, EMR with input from the participating departments. Coordination of the overall Conservation R&D Task is the responsibility of OERD.

Table 1. Energy Conservation R&D Evaluation Modes

Program 1.1	Industrial Energy Conservation R&D (IERD)
	- Interdepartmental Advisory Committee composed of representatives from: DRIE, EC (p.44), EMR/ECB (p.39), EMR/OERD, NRC (p.51), TC (p.55);
Program 1.2	Industry
	- Interdepartmental Program Committee composed of representatives from: AECL (p.27), EC (p.44), EMR/CANMET (p.33), EMR/OERD, EMR/ECB (p.39), NRC (p.51);
Program 1.3	Agrifood and Fisheries
	- Informal meetings between AC (p.26) and F&O (p.46), and OERD.
Program 1.4	Building
	- Interdepartmental Program Committee composed of representatives from: CMHC (p.32), EMR/CANMET (p.33), EMR/ECB (p.39), EMR/OERD, HWC (p.49), NRC (p.51), PWC (p.53);
Program 1.5	Transportation
	- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/TEB (p.44), EMR/OERD, NRC (p.51), TC (p.55);
Program 1.7	Energy Systems
	- variety of review mechanisms existing within EMR/CANMET (p.33).

TASK 2: FOSSIL FUELS AND GENERIC ENVIRONMENT

The fossil fuels and generic environment task is comprised of six Programs. The first four cover technologies relating to oil sands/heavy oil recovery, upgrading and processing, and coal supply and utilization including environmental R&D activities related to each. The fifth Program deals with environmental issues which relate to more than one technology area, and the sixth centralizes, for administrative purposes, contributions of funds to the energy R&D activities of the International Energy Agency (IEA).

Many energy R&D projects are closely planned and, in many cases, co-funded with industry, with the base budgets of several departments, and with support programs such as the Unsolicited Proposals Program (UPP) of Supply and Services Canada.

Program managers within Task 2 seek input from a variety of sources when formulating or modifying Program plans (table 2). In particular, the system of Program Committee's allows intra and interdepartmental input to CANMET's energy R&D activities in the oil sands, heavy oil and coal programs and to EC's energy R&D activities dealing with environmental considerations. In addition, the research program of CANMET is annually presented to and approved by the Minister's National Advisory Council to CANMET (MNACC). A further indirect source of consulation to energy R&D programs is CANMET's participation on the Coal Coordination Committee of the Interprovincial Advisory Committee on Energy.

The Environment Committee reviews its oil sands and heavy oil subprogram with the Canadian Petroleum Association. The majority of the environmental projects are conducted in cooperation with, or cost-shared with, the oil industry and provincial agencies.

In addition, government/industry workshops are held to review and assess results and to discuss future directions.

The Panel has conducted a major contracted-out review of Task 2 activities in 1984 as part of the periodic evaluations.

Policy advice is provided to the Task by the Petroleum Resource Branch of the Energy Commodities Sector, EMR and by the Coal Division of the Mineral Policy Sector, EMR. Overall coordination is provided by the Office of Energy R&D, EMR.

Table 2. Fossil Fuels and Generic Environment R&D Evaluation Modes

Program 2.1 Oil Sands/Heavy Oil

- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/CANMET (p.33), EMR/TEB (p.44), EMR/OERD, HWC (p.49), NRC (p.51);

Program 2.2 Coal Supply

- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/CANMET (p.33), EMR/GSC (p.40), EMR/Coal Policy (p.36), EMR/OERD, NRC (p.51), TC (p.55);

Program 2.3 Coal Combustion

- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/CANMET (p.33), EMR/Coal Policy (p.36), EMR/OERD, NRC (p.51);

Program 2.4 Environment

- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/CANMET (p.33), EMR/Coal Policy (p.36), EMR/OEA, EMR/OERD, F&O (p.46), HWC (p.49), NRC (p.51);

Program 2.5 Generic Environment

- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/OEA, EMR/OERD, F&O (p.46), INA (p.50);

Table 2. Fossil Fuels and Generic Environment R&D Evaluation Modes (cont'd)

Program 2.6 International Energy Agency

- A major activity of the IEA involves reviews of national R&D programs. These reviews are intended to assess the character and effectiveness of national energy R&D efforts in the context of each nation's energy and resource situation. Furthermore, in-depth "thematic" review visits to participating countries are also done to provide an overview of a specific activity, such as the Canadian synthetic liquid fuels activities which were examined in 1985, and the Canadian R&D activity in buildings energy conservation R&D being conducted in 1988.

- Although there is no formal evaluation mechanism, Canadian participation in collaborative R&D projects under the auspices of the International Energy Agency are extensively monitored and coordinated. The nature of these Canadian commitments with other countries requires careful planning before and during participation. Also, by definition, collaborative R&D projects induce players to expect results from each other. Thus Canadian activities are more or less audited continously.

- The Office of Energy R&D provides the focus for coordinating and monitoring Canada's involvement.

- Canadian participation in collaborative energy R&D under the IEA has been reviewed in ("Assessment of Benefits from Canadian Participation in Collaborative Energy Research and Development under the International Energy Agency, 1974-1985": OERD 87-05).

TASK 3: FUSION

The fusion energy task comprises two main programs, magnetic confinement experiments conducted at the Tokamak de Varennes, and the Canadian Fusion Fuels Technology Project (CFFTP). International collaboration is an important component of the whole Task.

The National Fusion Program (NFP) is managed by AECL following transfer of R&D management from the National Research Council (NRC) during 1987/87. In order to provide strategic guidance in this activity, a Strategic Advisory Committee has been constituted and ad-hoc groups are assembled to gain the input from departments of the Government of Canada, from the provinces and the fusion community. International cooperation represents a further dimension of the NFP. The Program stresses international collaboration with the aim of forging links with the major world programs in order to acquire information, promote technology transfer into Canada, foster commercial opportunities, and increase the Program's relevance and leverage.

Canada is active in several International Energy Agency (IEA) fusion coordinating committees and implementing agreements, and participates in the TEXTOR joint experiment and the BEATRIX materials exchange through this agency. The NFP also takes part in the Economic Summit process of the Western heads-of-state, since fusion is one of the areas identified in the "technology, growth and employment" thrust initiated at the Versailles summit of 1982. Bilateral fusion agreements for collaborative activities between Canada and Japan, and Canada and the EEC are in operation; a Canada-US agreement is under study.

The NFP also maintains a watching brief on other potential projects which meet the overall objectives. No other routes to fusion energy are currently pursued although some support is provided to inertial confinement technology through NSERC programs.

Policy advice and overall coordination are provided through the Office of Energy Research and Development, EMR.

Table 3. Fusion R&D Evaluation Modes

Program 3.4 Fusion - Review and evaluation mechanisms of Atomic Energy of Canada Limited (AECL) (p.27); - Several International Energy Agency (IEA) fusion coordinating committees and implementing agreements.

TASK 4: RENEWABLE ENERGY

The renewable energy task encompasses the technology for harnessing Canada's large, dispersed, renewable energy sources. There are eight programs, divided for administrative purposes into the two groups of bioenergy and solar. Solar embraces active and passive solar, wind, hydraulics, geothermal and photovoltaics. The main manager is the Renewable Energy Branch of EMR.

Many energy R&D projects are closely planned and, in many cases, co-funded with industry, with the base budgets of several departments, and with support programs such as the Unsolicited Proposals Program (UPP) of Supply and Services Canada.

A number of committees have been struck to guide the Task and promote cooperation and coordination among participating departments (EMR, EC and AC).

Private sector input is received formally through steering committees, one each for the Bioenergy (NACB) and Solar (NEST) Programs of EMR/REB. Each committee has a private sector chairman, many members from industry and academia, provincial government representation, government program managers and at least one OERD representative.

Interdepartmental coordination is facilitated by a committee structure, again one each for the Bioenergy Program and the Solar and other Programs. Members are the R&D program managers from participating departments. These committees determine, review and recommend the appropriateness of ongoing and planned R&D activities as well as recommend/adjust funding levels between departments within the overall budget. In particular, Panel funds are used to pursue the R&D objectives of the National Conservation and Alternative Energy Initiative (NCAEI) (now the Energy Efficiency and Diversity Initiative: EED) of the Renewable Energy Branch, EMR.

In EMR/REB, (for the solar et. al. work), there are Technical Advisory Committees TAC (one for each technology), chaired by and principally comprised of private industry or university representatives who provide technical advice and program direction and also review and recommend proposals. Their input is received and integrated into the proposals submitted by EMR/REB to the interdepartmental solar committee via the program managers. An OERD officer is an "observing member" on these technical advisory committees. They also report to the above mentioned "solar" steering committee.

A bioenergy interdepartmental technical review committee reviews and selects proposals based on guidelines from private sector steering committees, expert workshops, economic advisors and other consultations.

A major external review of Task 4 was conducted in 1982 and one is scheduled for 1988-89, in keeping with of the periodic external evaluation process of the Panel, recommended by the Auditor General.

Policy advice on the new liquid fuel, ethanol, originates with the Energy Strategy Branch (EMR/ESB) of the Energy Policy Sector, the Transportation Energy Branch (EMR/TEB) of the Energy Commodities Sector and the Renewable Energy Branch (EMR/REB) of the Energy Programs sector. Coordination with the overall Energy R&D Program is the responsibility of the Office at Energy R&D, EMR.

Table 4. Renewable Energy R&D Evaluation Modes

Program 4.1	Hydraulics; 4.2 Active Solar; 4.3 Passive Solar; 4.4 Photovoltaics; 4.6 Wind; 4.7 Geothermal
-	One interdepartmental (NEST) Committee composed of representatives from: AC (p.26), EC (p.44), EMR/REB (p.42);
-	National Technical Advisory Committees (TAC) EMR/REB (p.42).
-	National (NEST) Steering Committee (EMR/REB).
Program 4.5	Bioenergy
-	Interdepartmental Bioenergy Committee composed of representatives from: AC (p.26), CFS (p.30), EC (p.44), EMR/TEB (p.44), EMR/REB (p.42);
-	National Advisory Committee on Bioenergy (see EMR/REB p.42).

TASK 5: NEW LIQUID FUELS

The new liquid fuels task is aimed essentially at transportation fuels. Technologies that convert Canada's unconventional feedstocks are studied in R&D programs covering the direct liquefaction of coal or mixtures of coal with bitumen, heavy oils and residues; the indirect liquefaction (by gasification) of coal; the upgrading of synthetic crudes and the conversion of natural gas to liquid fuels. The Task also addresses new transportation fuels, studying the use and regulations for fuels such as propane, natural gas, methanol and, as well, studies hydrogen and the electrochemical technologies including batteries and fuel cells. There is also a Program on the environmental impacts of new liquid fuels production and use. The principal participants in the Task are EMR and TC, with work also done by EC, AC, DND and HWC.

Many energy R&D projects are closely planned and, in many cases, co-funded with industry, with the base budgets of several departments, and with support programs such as the Unsolicited Proposals Program (UPP) of Supply and Services Canada.

Task 5 is coordinated, planned and reviewed through various interdepartmental committees. All major projects are overseen by steering committees with members from provinces, industry and government of Canada. In addition, the research program of CANMET is annually presented to and approved by the Minister's National Advisory Council to CANMET (MNACC). The advice of the Canadian General Standards Board (CGSB), Canadian Gas Association (CGA), the Propane Gas Association of Canada and of the Canadian Oxygenated Fuels Association is sought and considered in the planning of research activities dealing with automobile fuels.

Research results are presented at international conferences, Canadian seminars and regularly published in specialized journals or government publications. EMR is a co-sponsor with the U.S. Department of Energy of the annual Windsor Workshop on Alternative Fuels. All programs hold at least one technical workshop or seminar a year in addition to committee meetings.

The last in-depth review of Task 5 was conducted internally in 1984, as part of the periodic evaluations recommended by the Auditor General.

Policy advice on New Liquid Fuels originates with the Transportation Energy Branch of the Energy Commodities Sector, EMR, with input also from Transport Canada. Coordination with the overall energy R&D program is the responsibility of the Office of Energy R&D, EMR.

Table 5. New Liquid Fuels R&D Evaluation Modes

Program 5.1 Direct Liquefaction and 5.2 Gasification

- Interdepartmental Steering Committee composed of representatives from: DRIE, EC (p.44), EMR/Coal Policy (p.36), EMR/CANMET (p.33), EMR/TEB (p.44);

Program 5.3 Biological Processes

- Reviewed under Program 4.5 Bioenergy (Program 5.3 will not exist starting fiscal year 1988-89).

Program 5.4 Fuel Processing

- Interdepartmental Steering Committee composed of representatives from: DRIE, EC (p.44), EMR/CANMET (p.33), EMR/TEB (p.44), EMR/REB (p.42), NRC (p.51);

Program 5.5 Fuel Use

- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/TEB (p.44), MOSST, DND (p.51), NRC (p.51), TC (p.55);

Program 5.6 Hydrogen and Electrochemistry

- Interdepartmental Steering Committee composed of representatives from: DRIE, EMR/CANMET (p.33), EMR/REB (p.42), DND (p.51), NRC (p.51), MOSST, TC (p.55);

Program 5.7 Environment

- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/CANMET (p.33), EMR/REB (p.42), EMR/OEA, HWC (p.49), TC (p.55);

TASK 6: OIL, GAS, ELECTRICITY

The oil, gas and electrical R&D task is comprised of seven programs covering petroleum geoscience, permafrost and gas hydrates; marine engineering; offshore geotechnics; materials for offshore structures and pipelines; environmental impacts and forecasting for frontier hydrocarbon developments; transportation of oil and gas; and electrical R&D. The Task is managed by seven departments to meet responsibilities of the Government of Canada, in cooperation and consultation with industries and provinces, in key sectors for industrial and economic growth.

Task 6 is coordinated, planned and reviewed through seven program committees with representation from eight government departments (viz. COGLA, EC, EMR, F&O, INA, NRC, PWC, TC), industry and, in some cases, technical experts from provincial departments. Additional extensive consultation is achieved through contracted reviews external to government, and committees such as the Minister's National Advisory Council to CANMET (MNACC) that are advisory to Ministers of managing departments. All programs hold at least one technical open workshop or seminar a year in addition to committee meetings. A Task bibliography is published and updated regularly.

Although oil and gas R&D is not aimed solely to respond to the needs of industry, the close involvement of the petroleum industry is encouraged through representation of the Canadian Petroleum Association (CPA) on program committees and by dialogue with industry research managers at workshops and in project planning and implementation. Benefits of this collaboration can include relevant and anticipatory program planning; sharing of hardware, data, and field support; improved understanding between developer and regulator; and consequently, a reduction in the time required to make decisions with confidence that considerations of human safety, and environment, and the costs to the developer are respected. In the same vein, relevant output and future direction of the Task is used and reviewed by committees of the Canadian Standards Association, in developing codes and standards for offshore oil and gas development.

Many PERD oil and gas R&D projects are closely planned and, in many cases, co-funded with industry, with the base budgets of several departments, and with targetted programs. The latter have included the Environmental Studies Research Funds (ESRF) coordinated by the Canada Oil and Gas Lands Administration, the Frontier Geoscience Program (FGP) of the Geological Survey of Canada, the Northern Oil and Gas Action Program (NOGAP) coordinated by Indian and Northern Affairs Canada, and the Unsolicited Proposals Program (UPP) of Supply and Services Canada. PERD research managers have membership on committees governing these programs. The scheduling, performance and success of PERD oil and gas R&D projects are influenced by the availability of these other funds.

In 1985, the Panel contracted for a major review of Task 6, as part of the periodic evaluations recommended by the Auditor General.

Policy advice to the Task is provided by the Petroleum Resources Branch of the Energy Commodities Sector, EMR. Overall coordination is provided by the Office of Energy R&D, EMR.

Table 6. Oil, Gas and Electricity R&D Evaluation Modes

Program 6.1 Geoscientific R&D

- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/COGLA (p.35), EMR/GSC (p.40), NRC (p.51), plus industry and provincial government members.

Program 6.2 Marine Engineering

- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/GSC (p.40), EMR/COGLA (p.35), F&O (p.46), INA (p.50), NRC (p.51), PWC (p.53), TC (p.55), plus industry members; and
- External Steering Committee (see EMR/COGLA in p.35).

Program 6.3 Offshore Geotechnics

- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/COGLA (p.35), EMR/GSC (p.40), F&O (p.46), INA (p.50), NRC (p.51), plus industry and provincial members; and
- Other evaluation mechanisms from participating departments such as EMR Marine Geoscience Coordinating Committee.

Program 6.5 Materials

- Interdepartmental Steering Committee composed of representatives from: EMR/CANMET (p.33), EMR/COGLA (p.35), EMR/ECS, F&O (p.46), INA (p.50), NRC (p.51), PWC (p.53), TC (p.55); and
- External Steering Committee (see EMR/COGLA in p.35).

Table 6. Oil, Gas and Electricity R&D Evaluation Modes (cont'd)

Program 6.6 Transportation of Oil and Gas

- Interdepartmental Steering Committee composed of representatives from: CIDA, DRIE, EC (p.44), EMR/CANMET (p.33), EMR/COGLA (p.35), F&O (p.46), INA (p.50), NRC (p.51), TC (p.55), plus industry members; and
- All of Transport Canada's R&D activity is reviewed by industry committees advisory to the Minister, (p.55).

Program 6.7 Environment

- Interdepartmental Steering Committee composed of representatives from: EC (p.44), EMR/COGLA (p.35), EMR/OEA, F&O (p.46), INA (p.50), TC (p.55), plus industry members; and
- Other evaluation mechanisms from participating departments such as the EC Canadian Atlantic Storms program (CASP) Steering Committee (see p.44).

Program 6.8 Electrical R&D

- Interdepartmental Steering Committee composed of representatives from: DRIE, EC (p.44), EMR/ECS, NRC (p.51); and
- Canadian Electrical Association (CEA) R&D Program Committees and CEA Engineering and Operating Division Committees involving all utilities and the engineering and manufacturing communities.

TASK 7: COORDINATION

This task supports the overall coordination of the energy R&D program of the Government of Canada. The Office of Energy R&D consults with sectors responsible for the development of energy policy. Interdepartmental consultation is provided through the Panel on Energy R&D and its committee structure. International consultation is achieved through OERD representation on bilateral (e.g. Canada-U.S. MOU on Energy R&D) and multilateral (e.g. IEA Committee on Research and Development) committees. OERD represents the Government of Canada on the management committee for the Alberta-Canada Energy Resources Research Fund. OERD staff also consult directly with industrial, academic and provincial organizations.

DEPARTMENTAL EVALUATION MECHANISMS

DEPARTMENTAL EVALUATION MECHANISMS

The following Table 7 describes the mechanisms used by each participating department and sector to evaluate energy R&D either directly or indirectly. When indirect evaluations of energy R&D programs occur, they can take the forms of various mechanisms within departments and sectors. The following table attempts to describe this complexity of the evaluation process, however, due to the necessarily evolutionary nature of the subject the table should not be considered complete or static. Furthermore, departments and sectors have a wider role than energy R&D alone and thus many nonrelated evaluation mechanisms are not described.

Table 7 Departmental Evaluations of Energy R&D

Evaluation Mechanism	Membership	Role
Agriculture Canada		
1. Canadian Agricultural Research Council (CARC)	25 members from provinces and government of Canada, universities, agribusiness producers and consumers.	- Advise all players on agricultural research. - Reports to Canadian Agricultural Services Coordinating Committee.
2. Canada Committee on Agricultural Engineering Services (CCAES)	Sub-Committee of CARC - Experts from provinces, university, industry and government of Canada.	- Produced in 1983, a major energy study "Strategy for Energy Research, Development & Demonstration in the Agriculture & Food System" providing energy R&D priorities. Ongoing advice on priorities and coordination of federal/provincial/industry efforts.
3. Industry Relations Advisory Board to the Research Branch	Senior Branch Staff (DG) and industry representatives.	- Develops RFP's. - Reviews and selects proposals. - Recommends to Branch management annually on program implementation.
4. Advisory Boards to Research Branch establishments	Industry, university and provincial representatives.	- Reviews establishment programs. - Recommends priorities, particularly on a regional basis.
5. Internal Audit and Evaluation Branch	Inhouse staff.	- Periodic scheduled program audits and evaluations.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Agriculture Canada (cont'd)		
6. Specific industry linkages.	Various industry associations or representatives, e.g. greenhouse grower organizations may be asked to review R&D on greenhouses as appropriate.	- Review R&D programs/ projects. - Recommend R&D.
7. Research Scientists.	Energy specialists.	- Preparation of reviews of R&D results covering a specific technological area to a) widely disseminate information; b) initiate technology transfer; c) obtain comment.
Atomic Energy of Canada Limited		
1. Board of Directors	3 federal Deputy Ministers, Chairman of NSERC, 11 private sector members.	- Review all AECL R&D annually.
2. National Fusion Program Strategic Advisory Committee	AECL, Universities and representatives of Canadian Fusion Fuels Technology Project. (CFFTP) and Centre Canadien de fusion magnétique (CCFM) programs.	- Reviews long-term strategy of the National Fusion Program. - Suggests future alternatives and additions within the constraints of the program. - Reviews the results and advise on its relevance to international programs.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Atomic Energy of Canada Limited (cont'd)		- Identify areas of expertise developed in the program suitable for business and industrial development and advise on strategies to promote such involvement. - This Committee is a re-oriented successor to the NRC Advisory Committee on Fusion Related Research.
3. Interdepartmental/ Intergovernmental Consulting Groups	Federal departments such as EMR, NRC, MOSST, External Affairs and AECB which form the core; Other federal departments added as indicated by the issue, e.g. NSERC concerning fusion funding in universities, DRIE for business development. Provincial representatives when appropriate	- Groups are set up to address well-defined issues and are disbanded when their usefulness has ended. - Advice on the issue at hand. Groups have been set up to - coordinate actions on ITER (International Thermonuclear Experimental Reactor), on the ALTECH project, and to advise NSERCC on grants to university fusion researchers.
4. Canadian Fusion Fuels Technology Project (CFFTP) Advisory Committee	Representatives of Centre canadien de fusion magnétique (CCFM) and AECL, federal departments, universities, and representatives of U.S., Japan and European Fusion Program.	- Reviews past progress, present status and future plans. - Forms recommendations and issues reports for the Steering Committee. - This committee is required by the current CFFTP agreement.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Atomic Energy of Canada Limited (cont'd)		
5. Centre canadien de fusion magnétique (CCFM) Technical Advisory Committee	AECL and CFFTP representatives, universities and U.S. representatives.	- Reviews the project and reports to the CCFM Board of Directors. - This committee is required by the current CCFM (Tokamak) agreement.
6. Heat Transfer and Fluid Flow Service (HTFS),	Member companies, from Canada and foreign countries Canadian and U.K. govts.	- Formally review and approve the work program and operating procedures for HTFS.
6a. HTFS Technical Meetings, Research Symposium and Fouling Forum.	Member companies, from Canada and foreign countries Canadian and U.K. govts.	- Enable members to learn about and discuss, in detail, the HTFS work program. - Held a few days prior to the Sponsors Panel Meetings.
6b. HTFS Review Panel Meetings	Project coordinator, elected people from the member companies, universities and consultants	- Discuss and advise in detail on the work undertaken in seven or more technical areas. - Advise HTFS on the ongoing and future programs. - Ensure that the information and design methods meet the needs of the industrial sector. - Represent the interests of HTFS members.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Canadian Forestry Service (AC)		
1. CFS ENFOR Technical Committee	Representatives at the scientist or program manager level of all CFS establishments participating in the ENFOR Program; chaired by CFS-HQ. Also scientific authorities for bioenergy R&D contracts.	- Review and recommend on research proposals; provides the program, and conducts periodic evaluations of the program or of specific parts of it.
2. CFS Committee of Research Establishments (CORE)	Research Program director from each CFS regional establsihment, Directors of National Institutes, and, from HQ Forest Science Directorate, Director of Research, Director of Forest Insect and Disease Survey and and Technical Services, and the DG, who chairs the committee.	- Coordinates CFS research and technology policies and programs (including bioenergy), - Reviews research and technology policies, issues, programs and planning to develop concerted approaches to exploiting opportunities and resolving problems; - Also reviews and proposes revision of planning, implementation and evaluation procedures for research and technology activities. Reports to CFS Senior Management Committee.
3. Forest Research Advisory Council of Canada (FRACC)	Representatives of provincial governments (5), industry (5), and universities (3), as well as Canadian Pulp and Paper Association (1) and CFS (1).	- Provides a national focus for forestry research coordination, identifies broad competing research needs and priorities and reviews research activities to obtain a balanced response to national and regional needs. Reports to the Associate Deputy Minister, CFS.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Canadian Forestry Services (cont'd)		
4. Regional Forest Research Advisory Committees	Includes a broad range of forest sector agencies.	- Functions are similar to those of FRACC but at the regional or provincial level.
5. CFS Project Review Process	Panels, appointed by the establishment concerned in consultation with HQ, include typically 4 members-2 CFS scientists from other establishments, 1 outside expert, and 1 HQ scientific coordinator who chairs the panel - all with expertise in the relevant field.	- Individual research projects at all CFS regional establishments and institutes are reviewed on a 3-year cycle by peer review panels; - Reviews emphasize the quality of science involved, but also look at project objectives, progress, resources, and relationship to overall national program objectives. Bioenergy projects are included in this process on a regular basis.
6. EMR Bioenergy R&D Advisory Committee	Representatives from all sectors involved in bioenergy.	- Reviews and advises on R and D activities of EMR's Bioenergy Division; relates to CFS bioenergy program only indirectly, but CFS Strategic Plan for Bioenergy Research 1987-92 was submitted to the Committee for comment, and a CFS representative has attended all meetings to date.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Canadian Forestry Services (cont'd)		
7. IEA Committees		- Canada's involvement in the IEA Bioenergy R&D Agreement is managed and reviewed through a series of technical committees, on which CFS or EMR is represented, and by an Executive Committee in which CFS and EMR both participate, and which is currently (1988 and 1989) chaired by the Canadian representative (CFS).
Canada Mortgage and Housing Corporation		
1. National Housing Research Committee	Fed. and prov. govts, industry associations and other interested users of housing research.	- Discuss and recommend sector research plan. - Sets research priorities. - Assigns representives to Advisory Committees on related projects.
2. Advisory Committees and Working Groups (e.g. Indoor Air Quality Working Group)	Fed. and prov. govts., industry associations, manufacturers, universities.	- Committee for each technical area. - Help define needed research. - Monitor progress of the project. - Comment on and/or evaluate final reports. - Help define most appropriate communication methods.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Canada Mortgage and Housing Corporation (cont'd)		
3. Forums	Fed. and prov. govts, industry associations and other interested	- Make inputs as to research needs and communication strategies.
4. Internal Program Evaluation	Division Program Evaluation	- Reviews and evaluates all CMHC programs on a cyclical basis to determine whether they are meeting their objectives.
Energy, Mines and Resources/CANMET		
1. The Minister's National Advisory Council to CANMET (MNACC): -one main committee -6 subcommittees (e.g. coal, oil & gas)	Chaired by Industry; 12 to 18 members from industry,2 from universities, and 2 from provincial research organizations.	- Review entire CANMET program on an annual basis through a number of sub-committees. - Make recommendations: e.g. create a field oriented coal preparation technology service to enable the implementation of process modifications and to assist in operator training.
2. SubCommittees of the Inter-departmental Panel on Energy R&D.	Government of Canada and industry representatives.	- Establish R&D Programs for Panel funding, review new and existing projects.
3. Committee on Atlantic Coal	Government of Canada, provinces, utilities, Cape Breton Development Corporation	- Priorize R&D requirements of Atlantic coal producers and users. - Propose R&D studies for cost-sharing with EMR/CANMET.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
EMR/CANMET (cont'd)		
4. Coal Coordination Committee of the Interprovincial Advisory Committee on Energy.	Government of Canada, provinces and utilities.	- Coordinates provincial coal R&D. - Further indirect source of consultation to energy R&D programs.
5. Review of 50/50 Program	Contractor	- Due for Spring 88. - Will determine and assess the impact and use made of the technology developed as a result of private sectors participation. - Will make recommendations with respect to future directions for the program.
6. CANMET Internal Program Evaluation	Program Evaluation Group of EMR.	- Reviews and evaluates all CANMET energy programs on a cyclical basis to determine whether they are meeting their objectives. - The energy program of CANMET is scheduled for evaluation (1988-89), including a brief pre-evaluation assessment.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
EMR/Canada Oil and Gas Lands Administration (COGLA)		
1. Management Board and Program Study Committees (4) for the Environmental Studies Research Funds.	Government of Canada, oil industry, provincial governments, (Nfld and NS), public.	- Provide advice to the Minister of EMR, the Minister of INA, the Canada-N.S. Offshore Petroleum Board, and the Canada Newfoundland Offshore Petroleum Board.
2. 6.2 Program Committee	F&O, DOE, PWC, NRC, Oil Industry, COGLA.	- Advise on the design and conduct of the Marine Engineering Program.
3. Frontier Lands Safety Advisory Committee	Oil industry, govt. of Canada, CNOPB, CNSOPB.	- Advise COGLA on Safety related matters.
4. Canada Standards Association Working Groups on offshore installations	Govt. of Canada, oil industry, consultants, universities	- Advise CSA on the nature and content of standards for offshore structures.
5. Canada General Standards Board Working committee on exposure suits.	Govt. of Canada, oil industry clothing industry	- Provide advise to CGSB on development of standards.
6. Three program evaluation workshops held in 1986.	Govt. of Canada, provincial govts., oil industry, consultants, universities.	- Evaluate and advise on the appropriateness of the Marine Engineering Program and to recommend changes to other programs. (Significant changes to the program were made as a result of this).

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
EMR/Mineral Policy Sector, Coal Division		
1. Committee on Atlantic Coal (Existing)	Prov. govts; utilities; EMR Coal Division & CANMET; Cape Breton Development Corporation; NRC.	- Coordinates coal R&D in the Atlantic Region. - Direct Task Force on Coal Beneficiation chaired by Nova Scotia, and to the Atlantic Coal-Liquid Mixtures Working Group.
2. Coal Utilizaton Program 1980-86 (Management/Steering Committees for Specific Coal Projects:)		
2a- Chatham Circulating Fluidized Bed. (Existing)	Management Committee: N.B. Electric Power; N.B. Dept. of Natural Resources and Energy; N.B. Dept. of Commerce and Industry. Technical Committee: CANMET chairperson; N.B. Dept. of Environment; University of N.B.; RPC; CEA; N.S. Power; EMR Coal Division.	- Management Committee advises on overall program and policy; oversaw construction of the demonstration facility. - Technical Committee oversees ongoing operations of the facility.
2b- Point Tupper N.S. Fluidized Bed Material Testing Study (Completed).	N.S. Power; EMR Coal Division & CANMET.	- Manages testing program.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
EMR/MPS, Coal Division (cont'd)		
2c- Coal-Water Preparation & Combustion Steering Committee (Existing)	CBDC; N.B. Electric Power; N.S. Power; AB Carbogel; EMR Coal Division & CANMET.	- Manages project.
2d- Coal-Water Preparation & Combusion Technical Committee (Existing)	NRC; N.B. Res. & Productivity Council; Nfld. Hydro; Hydro Qué.; Ont. Hydro; CBDC; N.B. Electric Power; N.S. Power; AB Carbogel; EMR Coal Division & CANMET; Atlantic Coal Liquid Mixtures Working Group.	- Provides technical advice to Steering Committee.
2e- Coal-Water Fuel Chatham and Charlottetown Test Steering Committees.	Maritime Electric; N.B. Power; N.S. Power; CBDC; EMR Coal Division and CANMET.	- Develop demonstration program objectives; oversee demonstrations.
2f- CEA, Flue Gas Emissions Control Advisory Panel. (Existing)	Eight member utilities from Canadian Electrical Association; EMR-Coal Division & CANMET; Environment Canada.	- Advises CEA Generation R&D Committee on RFP's pertaining to emissions control technologies.
2g- Beneficiation of high sulphur Atlantic coals. (Completed)	SNC; Committee on Atlantic coal; N.S. Dept. of Mines & Energy; N.S. Power; N.B. Power; Atlantic Coal Institute; University of N.B.; CBDC.	- Provides information to federal, N.S., N.B. governments on the beneficiation potential of Maritime coals.
2h- Coal Utilization Program Evaluation Steering Committee	EMR Coal Division; EMR Program Evaluation	- Oversees formal evaluation of complete program.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
EMR/MPS, Coal Division (cont'd)		
3. Scotia Synfuels (proposed)	EMR, Coal Division; Nova Scotia Department of Mines and Energy; ACOA; Petro-Canada; Synfuels Consortium.	- Evaluation of co-processing technology for Cape Breton coals.
4. Coal Opportunities Program Working Group. (proposed)	EMR Coal Division and CANMET; Coal Association of Canada; individual coal producers (eg. Smoky River Coal) coal-burning electric utilities (eg. Transalta); oil companies (eg. Esso Resources); Canadian Electrical Association; numerous provinces (B.C., Alberta, etc.); WDO; ACOA.	- Defines program objective, proposes specific projects for cost-sharing proposes provincial funding, considers funding from existing regional programs (eg. ACOA, WDO).
5. Canada-Nova Scotia Oil Substitution Agreement, not involved in Management Committee but involved in sub-committees on coal, liquefaction, gasification, coal-water fuel projects. (Existing)	Petro-Canada; CBDC; Atlantic Coal Institute; Nova Scotia Research Foundation; N.S. Power; N.S. government; Minas Basin Pulp & Power; Nova Scotia Resources Ltd.; EMR-Coal Division.	- Manages specific projects funded under the agreement.
6. International Energy Agency Agreement Low NO_x burner/ sorbent injection for SO_2 removal. (Existing)	Canada (Coal Division and CANMET); Denmark; Sweden; Dept. of National Defence; U.S. Environmental Protection Agency; Ontario Hydro; Environmental Energy and Research Corp.; Saskatchewan Power; Canadian Electrical Association; Environment Canada.	- Development of sorbent injection technology in Canada.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
EMR/Energy Conservation Branch (ECB)		
1. IERD Secretariat	Representatives of EMR/ECB	- Provide advise and industry input to the Program.
		- Assess the evolution and state of the art of the technology involved in each project.
		- Project screening and formation of technical committees of experts.
		- Make formal presentations of projects to the Interdepartmental Board (the IERD Advisory Board)
2. Technical Committee	Experts from various departments or groups inside government (eg. NRC, CANMET, EC)	- Provide specific expertise for the assessment of specific projects.
		- Assist the IERD Secretariat in making presentation to the IERD Advisory Board, as well as in the monitoring of the technical progress of the project.
	Experts from DRIE and/or EMR/Mineral Policy Sector.	- Provide commercial economic and marketing advice and input for each project.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
EMR/Energy Conservation Branch (ECB) (cont'd)		
3. Interdepartmental Board (IERD Advisory Board)	Representatives from DRIE, EC, EMR/ECB, EMR/OERD, NRC, TC.	- Review proposals - Vote on whether projects should be recommended for support and at what contribution level.
4. IERD Program Evaluation	EMR/Program Evaluation Group	- Review and evaluate the IERD Program on a cyclical basis to determine whether it is meeting objectives.
5. Internal Audit	EMR/Internal Audit	- Systematic, independant review and appraisal of the Department's operations.
EMR/Geological Survey of Canada		
1. Canadian Geoscience Council (CGC)	12 earth science societies. Members are in the mineral and petroleum exploration industries, prov. govts and universities.	- Reviews and advises on national geosciences activities carried out by EMR. eg. In 1984-85, two GSC activities reviewed by CGC, including Quaternary and Engineering Geology, which involved Energy R&D Panel-funded projects. Also in 1984-85, CGC committee evaluated geoscience programs.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
EMR/GSC (cont'd)		
2. Independent Industrial Advisory Committee on Geosciences	Petroleum, mineral exploration and other resource development industries.	- Advises EMR in carrying out responsibilities of Geosciences Sector.
3. National Geological Surveys Committee	Heads of Canadian and provincial geological surveys.	- Coordinates work of geological surveys across Canada. - Provides advice to govts. and other agencies or groups on earth sciences.
4. Independent Review Meetings	Provinces, industries, universities, other agencies from government of Canada.	- Discuss program, assess results. - Review past activities discuss future priorities.
5. Joint Industry-Govt. Working Group on Gas Hydrates.	Govt. of Canada, industry majors, CPA Frontier Division.	- Reviews gas hydrate R&D program and makes recommendations.
6. Ad hoc committees: on the joint Canada/France experiments at Caen, France.	Govt. of Canada, Carleton U., L'Ecole Polytechnique, France.	- Offer guidance & review of program/projects and evaluate, make recommendations for future work.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
EMR/GSC (cont'd)		
7. Committee for Needed Northern Research	Govt. of Canada, universities, northern resource industries	- Reviews and makes recommendations on northern R&D requirements.
8. Independent Review Committee for Coal	Coal industry, universities Canadian governments.	- Reviews and makes recommendations on coal resources program.
9. EMR Marine Geoscience Coordinating Committee	Representatives of different sectors of EMR.	- Consultation on Marine Geosciences.
10. GSC Program Evaluation.	Program Evaluation Group of EMR.	- Reviews and evaluates all GSC programs on a cyclical basis to determine whether they are meeting their objectives. - Last evaluation report dated January 1983 ("Bennet" report).
11. Petroleum Geoscience Research Committee. Permafrost and Gas Hydrates Geoscience Coordinating Committee Offshore Geotechnics Research Review Committee.	Petroleum industry, provincial government agencies, universities, Canadian government departments.	- Review, provide advice and direction to project managers in order to focus on the known and perceived needs of energy related geoscience research and optimize the use of limited resources.
12. Forums-sole sponsors and co-sponsored.	Federal and Provincial governments, industry, universities, public.	- Provide input as to research needs and inform public of activities performed in geoscience.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
EMR/Renewable Energy Branch (REB)		
1. National R&D Steering Committee (for technologies listed in 1a. below).	Govt. of Canada, industry, associations, universities and provincial govts.	- Provides advise and industry input to the program.
1a. Technical Advisory Committees TAC for:-hydraulics -active solar -passive solar -photovoltaics -wind -geothermal	Govt. of Canada, industry associations, universities and provincial govts.	- Provides technical advise to each program.
2. National Advisory Committee on Bioenergy (NACB)	Govt. of Canada, industry industry associations, universities and provincial governments.	- Provides advice and recommendation to the program on bioenergy.
3. Renewable Energy Working Party of the IEA.	Representatives of member countries.	- formal yearly review of R&D activities under-taken in relevant implementing agreements. - Coordinate international efforts in these areas.
4. IEA implementing agreement Annex/Task Committees.	Canadian and foreign govts and experts.	- Permits informal reviews and analysis of Canadian R&D Programs by foreign experts. - Coordinate international efforts in these areas.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
EMR/Transportation Energy Branch		
1. CNG Research Advisory Committee	Gas industry, vehicle industry, universities and government.	- Recommend research direction.
2. Diesel Fuels Emissions Project Advisory Committee	Oil and vehicle industries, fuel standards groups, government of Canada.	- Interpret results of research in its application to industry.
3. Alcohols Agreement of the IEA	Representatives of Member Countries.	- Biannual exchange of views on alcohol fuels and vehicle technology. Canada's Methanol in Large Engines (MILE) program is a major focus of the Agreement.
4. Propane Gas Association (PEAC), Technical Committee.	PEAC members, vehicle manufacturers federal and provincial governments.	- Recommends research topics; studies and uses R&D results; cooperation on cost-shared projects.
Environment Canada		
1. Canadian Environmental Advisory Council (CEAC)	Universities, industry (e.g. forest product companies), special interest groups (eg. World Wildlife Fund).	- Provides advice to Minister on Environmental issues. - Reviews Dept's activities. - External review in 1984, through the Royal Society of Canada, of the inter-departmental Long Range Transport of Air Pollutants (LRTAP) program.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Environment Canada (cont'd)		
2. Energy R&D Task 2 and Task 6 Environment Committees	Fed. govt., Canadian Petroleum Association.	- Review and approve study requirements and proposals. - Hold workshops to review R&D in program areas, evaluate results and set priorities.
3. Canadian Atlantic Storms Program (CASP) Committee.		- Reviews and approves study requirements and proposals related to CASP.
4. Informal linkages	Universities, companies, Canadian Petroleum Assoc., Petroleum Assoc for the Conservation of the Can. Env., provincial governments.	- Review studies, participate in joint programs.
5. Line Management Review	Varies according to program Department, OAG, university, industry, provincial agencies.	- Peer review of projects and programs. - Priority setting.
6. Internal Program Evaluation (in accordance with TB, OAG guidelines).	OAG, clients and partners dependent on program being reviewed.	- Evaluation of programs using outside consultants and departments evaluation staff.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
External Affairs		
1. Bilateral S&T Project Review Committee.	International consultation; chaired by External Affairs Officers.	- Energy R&D projects which are international in scope are reviewed annually.
Fisheries and Oceans		
1. National External Reviews		
1.1. Fisheries and Oceans Research Advisory Council (FORAC)	Independent consultants, universities, fishermen, packing/processing industry, Arctic Petroleum Operators Assoc., Can. Wildlife Assoc.	- Advises F&O Minister on all matters relating to fisheries research and marine sciences, the scope and adequacy of F&O science policies and programs, and the coordination of R&D programs in fisheries and marine science. - Undertook complete review of total science program in 1982 and since has been reviewing specific aspects. (eg. arctic activities).
1.2. Interdepartmental Committee on Oceans	All departments with ocean programs plus departments requiring services from such programs.	- Ensure coordination of federal policies and programs involving oceans.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Fisheries and Oceans (cont'd)		
1.3.Ministers' National Marine Council	In process of being created.	- Inform and advice on ocean issues, programs and policies.
2. National Management		
2.1.PERD committees	Federal departments and industry representatives	- Review DFO projects in competition with other agency proposals and support only the most worthy. - External reviewers often impose required modifications, milestones, etc.
2.2.Department wide evaluation	Office of the ADM, DFO/Science	- Undertakes evaluation of research priorities, including PERD, and documents on accountability accord for the coming year on each of the major science elements; physics and chemistry, biological sciences and hydrography.
2.3.Project submission reviews	Office of the ADM, DFO/Science	- Reviews all project submissions and develops a national strategy on which should be supported and with what priority.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Fisheries and Oceans (cont'd)		
3. Project Management 3.1. Steering Committee 3.2. Management Committee 3.3. Scientific Committee 3.4. Planning workshops	Representatives from fed. and prov. govts., universities and the private sector.	- Many DFO PERD projects are coordinated directly through a steering committee. - For e.g. - the Canadian Atlantic Storms Program (CASP) was developed through planning workshops, steering and management committees and scientific committees.
4. Line Management Reviews 4.1. Program Review Committee	Vary, depending upon the Program being reviewed. e.g. Review committee for DFO/Science in 1982 included: Fed. govt. universities (Can. & US), oil exploration, industry, fishing industry.	- Peer reviews and evaluates entire program.
4.2. Line Management	Line management, industry representatives and manages and fellow scientists within government and universities.	- Reviews proposals as to its technical merit and its relevance to both energy R&D and DFO objectives. - During project formulation DFO consults closely with outside representatives. - These are not cursory reviews.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Fisheries and Oceans (cont'd)		
4.3. Internal Program Evaluation (in accordance with TB and OAG guidelines).	Office within F&O which utilizes external reviewers on contract, e.g. for physical oceanography - Peat, Marwick & Partners; Dr. C. Garrett, Dalhousie University; Dr. C. Wunsch, MIT; Dr. H. Bryden, Woods Hole.	- Evaluates all departmental programs over 5 year period.
5. Workshops	- Participation from fed. departments, university community and the private sector.	- Review progress and identify future requirements.
Health and Welfare		
1. Annual Review Committees Environmental Health Directorate	Director-General, 3 Directors within Directorate, Special Advisor, and two external reviewers from industry, environmental groups, public or another government department or agency, e.g. Environment Canada (vary from year to year).	- Examine past achievements & and progress, approve projects for coming year for all programs within Directorate, including the energy program.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Health & Welfare (cont'd)		
2. Federal-Provincial Advisory Committee on Environmental and Occupational Health.	Federal and provincial govt. representatives: one from each Ministry of Health, and (usually) one or two from another provincial ministry, eg. Labour or Environment; Canadian Centre for Occupation Health and Safety (CCOHS); representatives from Environmental Health Directorate and other Branches of HWC;	- Reviews and comments on some individual programs, including R&D on energy eg. oil sands research, health surveillance, indoor air quality in residences and office environments.
3. Ad hoc internal committee on energy.	- Program manager, Project coordinators, section heads of groups involved in research and guideline development.	- Reviews energy program, sets priorities.
Indian and Northern Affairs		
1. COGLA Advisory Board and Program Study Committees (9)	See EMR/COGLA entry.	

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
National Defence		
1. R&D Executive Committee	Chief R&D, Assoc Chief R&D, Chiefs of Defence Research Establishments	Scientific & Technical Authority
2. R&D Program Review Committee	Chief R&D, Assoc Chief R&D, Military Operations Chiefs	Military Requirements Authority
3. Materiel Management Committee	ADM (Materiel), Assoc ADM (Materiel) Materiel Group Chiefs	R&D Procurement Authority
4. Program Control Board	Vice-Chief of Defence Staff, All ADMs	Financial Management Authority
5. Defence Management Committee	Deputy Minister, Chief of Defence Staff, Vice Chief of Defence Staff, All ADMs, Commanders of Military Commands	Corporate Executive Authority
National Research Council		
1. Council of the NRC and subcommittees	21 senior members from industry, government and university, appointed by the Governor-in-Council.	- Provide overall guidance and direction to the policies and research programs of the National Research Council. - Assessment Committee reviews major program initiatives, and makes recommendations to the full Council for approval.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
NRC (cont'd)		
2. Laboratory Div. peer Review Committees	Chairman of a Review Committee usually a member of Council; experts in the discipline under review, and drawn from organizations outside the Program and on occasion outside the country.	- Each laboratory Division is examined within a five-year cycle. - Provide to Council a report on the quality and relevance of the research and the effectiveness of procedures. - Provide to Council a further report describing actions to implement the recommendations of the Review Committee. - Reports are published as public documents.
3. Program Evaluation Office	Performed by external contractor, with advice from advisory committee of wide technical experience (mostly non-government).	- Examines the rationale of an NRC program, its objectives, and its effectiveness. - Examines outputs, effects and benefits of the program, including client benefits. - Each program is evaluated within a five-year cycle and reports are submitted to the president.
4. Internal Audit	Internal	- Systematic, independent review and appraisal of all NRC operations. - Advise senior management on the efficiency, economy and effectiveness of internal management practices and control.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Public Works Canada		
1. Indoor Air Quality Canadian Advices (informal)	Fed. and prov. gvts, industry universities, prof. organizations representing building owners (BOMA), design engineers and architects (ASHRAE), testing and materials specialists (ASTM), air quality researchers (APCA).	- Active consultation and communication to provide advice and recommendations on the program and to transfer findings.
	Informal PWC representation to:	- Provide consultation and communication with professional organizations.
	- Canadian General Standards Board (CGSB) - Interdepartmental Committee on toxic chemicals (ICTC)	
	- International cooperation.	- Provides relationship with countries doing similar research.
	- Training Meeting N.-Scotia University.	- Transfer results and findings outside PWC. Also source of feedback on indoor quality program.
2. BESA interdepartmental steering committee	Senior management level of federal departments	- Reviews the progress and provides policy direction when needed.
2a. BESA User Review Committee	Fed. prov. gvts, utilities, prof. organizations, universities.	- Guides the development of BESA modules by providing advice and recommendations.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Public Works Canada (cont'd)		
2b. International Building Performance Simulation Association (IBPSA)	Canadian and foreign organizations.	- Coordinates software development on an international basis (informal).
2c. BESA Evaluation Report		- Examined past achievements, reviewed and evaluated entire BESA program.
3. International Council on Thermal Energy Storage (ICTES), quarterly Seasonal Thermal Energy Storage Bulletin.	Canadian and foreign energy storage researchers	- Coordinate research efforts, disseminates information, plans future specialty conferences such as ENERSTOCK.
3a. IEA Energy Storage Implementing Agreement and; IEA Solar heating and Cooling Program.	Canadian and foreign govts and experts	- Coordinate international efforts in these areas. - Permit informal reviews and analysis of Canadian R&D Programs by foreign experts.
3b. Building heating (cooling-seasonal storage-Evaluation Report (contracted).		- Will examine past achievements and evaluate building heating/cooling program.
4. Lighting-Visual performance project.	Representatives from NRC and PWC.	- Joint evaluation of results in this particular project.
5. Ice-Structure Interaction Interdepartmental Committee	Fed. departments: PWC, F&O, INA, TC, NRC, EC. Industry, Industry Associations.	- Reviews, evaluates and sets program and project priorities - Provides industry input.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Transport Canada		
1. Modal Advisory Boards on R&D (Operational Planning Process)	15 to 20 members each: serving in personal capacity (academics, experts) or in official capacity as officers of corporations & trade/professional associations	- Advise on R&D policies: needs and opportunities, program thrusts, etc. - Facilitate information exchange and technology transfer between industry and govt. and enhance co-operations. - The T.C. Energy R&D Operational Plan (as well as Status Reports of work previously performed) are circulated for review by the various Advisory Board members.
2. Seminars	Govt., industry.	- Provide industry comments on specific elements of the energy R&D program.
2a- Energy R&D Seminar (April 10, 1986).	- Speakers and participants represented a wide range of researchers from industry, academia and government.	- Seminar objective: To review key highlights and achievements of research from 1980-86 conducted uner the Transport Canada component of the federal Energy R&D program as input to future planning efforts. - Keynote speaker was prominent industry researcher. - Participants were asked to evaluate seminar to assist future similar efforts. - Majority of responses were supportive and encouraging.

Table 7 Departmental Evaluations of Energy R&D (cont'd)

Evaluation Mechanism	Membership	Role
Transport Canada (cont'd)		
2b- Rail Freight Seminar (June 1986)	- Sessions chaired by Railway Advisory Board Working Group members. - Majority of representation from industry with over half of participants from other parts of Canada outside the seminar location as well as area of the United States.	- The seminar consisted of a two part program: -technical sessions held one day. - Review of Rail Freight Program (which supported energy related project work) via a meeting of the Rail Advisory Board.
2c- Environment Canada sponsored workshop (June 1986) on: Priorities for Research and Development of the Environmental and Health Implications of using alternative fuels	- Transport Canada participated in Co-ordination of Workshop which consisted of representation from industry, academic and government.	- Concentration of workshop was on establishing future priorities for research into the environmental and health implications of using alternative fuels supported by a review of existing efforts to date.

ABBREVIATIONS AND ACRONYMS USED IN THIS DOCUMENT

Abbreviations and Acronyms used in this Document

AC	Agriculture Canada
ACERRF	Alberta/Canada Energy Resources Research Fund
ACOA	Atlantic Canada Opportunities Agency
AECB	Atomic Energy Control Board
AECL	Atomic Energy of Canada Limited
APCA	Air Pollution Control Association
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASTM	American Society for Testing Materials
ASTP	Annual Science and Technology Plan
BESA	Building Energy Systems Analysis
BOMA	Building Owners and Managers Association
CARC	Canadian Agricultural Research Council
CASP	Canadian Atlantic Storms Program
CBDC	Cape Breton Development Corporation
CCAES	Canada Committee on Agricultural Engineering Services
CCFM	Centre Canadien de fusion magnétique
CCOHS	Canadian Centre for Occupational Health and Safety
CEA	Canadian Electrical Association
CEAC	Canadian Environmental Advisory Council
CFFTP	Canadian Fusion Fuels Technology Project
CFS	Canadian Forestry Services
CGA	Canadian Gas Association
CGC	Canadian Geoscience Council
CGSB	Canadian General Standards Board
CIDA	Canadian International Development Agency
CMHC	Canada Mortgage and Housing Corporation
CNG	Compressed Natural Gas
CNOPB	Canada-Newfoundland Offshore Petroleum Board
CNSOPB	Canada-Nova Scotia Offshore Petroleum Board
CORE	Committee of Research Establishments
CPA	Canadian Petroleum Association
CSA	Canada Standards Association
DFO	Department of Fisheries and Oceans
DND	Department of National Defence
DOE	Department of Environment (U.S.)
DRIE	Department of Regional and Industrial Expansion
EC	Environment Canada
EEC	European Economic Community
EED	Energy Efficiency and Diversity Initiative
EMR	Energy, Mines and Resources
EMR/CANMET	Canada Centre for Mineral and Energy Technology
EMR/COGLA	Canada Oil and Gas Lands Administration
EMR/Coal Policy	Mineral Policy Sector, Coal Division
EMR/ECB	Energy Conservation Branch
EMR/ECS	Energy Commodities Sector
EMR/EPS	Energy Policy Sector

Abbreviations and Acronyms used in this Document (cont'd)

EMR/ESB	Energy Strategy Branch
EMR/GSC	Geological Surveys of Canada
EMR/OEA	Office of Environmental Affairs
EMR/REB	Renewable Energy Branch
EMR/TEB	Transportation Energy Branch
ENFOR	Energy from Forests Program
ESRF	Environmental Studies Research Funds
F&O	Fisheries and Oceans
FGP	Frontier Geoscience Program
FORAC	Fisheries and Oceans Research Advisory Council
FRACC	Forest Research Advisory Council of Canada
HQ	Headquarters
HTFS	Heat Transfer and Fluid Flow Service
HWC	Health and Welfare Canada
IBPSA	International Building Performance Simulation Association
ICTC	Interdepartmental Committee on Toxic Chemicals
ICTES	International Council on Thermal Energy Storage
IEA	International Energy Agency
IERD	Industrial Energy Conservation R&D
INA	Indian and Northern Affairs
ITER	International Thermonuclear Experimental Reactor
LRTAP	Long Range Transport of Air Pollutants Program
MILE	Methanol in Large Engines Program
MIT	Massachussetts Institute of Technology
MNACC	Minister's National Advisory Council to CANMET
MOSST	Ministry of State for Science and Technology
MOU	Memorandum of Understanding
N.B.	New Brunswick
N.S.	Nova Scotia
NACB	National Advisory Committee on Bioenergy
NCAEI	National Conservation and Alternative Energy Initiative
ND	National Defence
NEST	New Energy Sources and Technologies
NFP	National Fusion Program
NOGAP	Northern Oil and Gas Action Program
NRC	National Research Council
NSERC	National Sciences and Energy Research Council
NSERC	Natural Sciences and Engineering Research Council of Canada
OAG	Auditor General, Office of the
OERD	Office of Energy R&D (EMR)
PERD	(Interdepartmental) Panel on Energy Research and Development
PWC	Public Works Canada
RFP	Request for Proposals
RPC	Research Productivity Council (New Brunswick)
TAC	Technical Advisory Committee
TB	Treasury Board
TC	Transport Canada
TEXTOR	Torus Experiment for Technology Oriented Research
UPP	Unsolicited Proposals Program
WDO	World Development Organization