Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada

Office of Energy Research and Development
Bureau de recherche et de développement énergétiques

1989 Guide to the Activities of the Panel on Energy Research and Development of the Government of Canada

Canada

1989 GUIDE TO THE ACTIVITIES OF THE PANEL ON ENERGY RESEARCH AND DEVELOPMENT OF THE GOVERNMENT OF CANADA

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Part 1: Overview

The Federal Energy Research and Development Program

The Federal Energy R&D Program is an interdepartmental program coordinated by the Panel on Energy Research and Development (PERD), on which are represented participating departments and agencies. Each of these has expertise and capability through its own R&D program, which enables it to participate effectively in related energy R&D projects sponsored by PERD. These projects are performed in cooperation with the provinces, private sector, academia and other nations, as appropriate. The R&D Program is consistent with the federal government's Decision Framework for Science and Technology. In this context, the overall objective of the program is:

> To provide the science and technology for a diversified, economically and environmentally sustainable energy economy.

PERD was established in 1974. It 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 national and international situation. Thus, over time, its focus has evolved from concerns regarding energy security and supply to the present issues of environmentally sustainable energy technologies.

PERD is responsible for reviewing and coordinating the Program and monitoring its products. This is managed through a system of interdepartmental committees which incorporate private sector recommendations, and the Office of Energy Research and Development (OERD), within EMR, which acts as the Secretariat to the Panel and coordinates the distribution of Panel funds to the R&D programs.

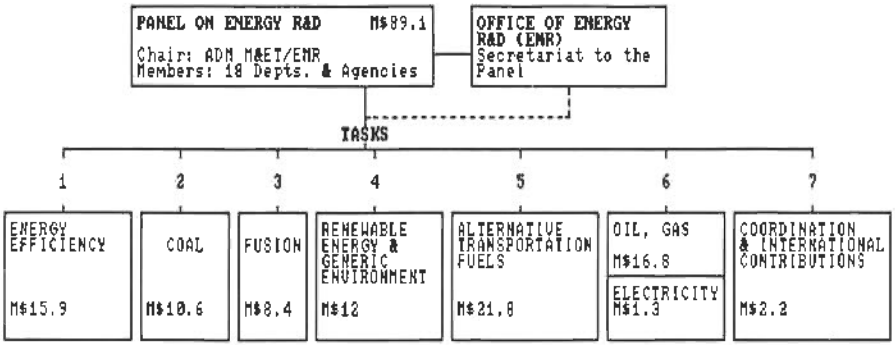
Within a continuous five-year planning framework, the Panel recommends a package of work, with appropriate resource allocation, annually to the Minister of Energy, Mines and Resources (EMR), who then makes recommendations to Treasury Board. After approval, resources are placed in the budgets of the participating departments and agencies to manage the delivery of their parts of the program.

These resources augment existing budgets of the participating departments in order to accelerate and coordinate their response to federal energy policy objectives within their largely non-energy policy mandates. These departments manage their R&D programs and contract out about 70 per cent of PERD resources through Supply and Services Canada (SSC).

About once every three years, the Panel recommends the priorities of a new five-year plan which the Minister of EMR presents to Cabinet for consideration. Upon approval, the Program continues for another cycle.

The Program is divided into seven TASKS, comprised of energy R&D managed through federal departments and agencies. In October 1988, Cabinet approved four years (1989 to 1993) of funding for Federal Energy R&D, with PERD's annual budget set at about $89 million. The breakdown by Task follows.

The Federal Energy Research and Development Program



N.B. These figures represent an average per year over the forthcoming four years.

The expected benefits of the Federal Energy R&D Program are reflected in industrial activity and the development of scientific and technical capability:

(a) The "technical services" and technology assessment work provide the information necessary to develop codes, standards, regulations, the capability to measure compliance, and the technical contributions which lay the framework for industrial activity in supply, substitution and efficient use of energy.

(b) The work with the private sector has direct commercial significance since it is generally proposed and cost-shared by them. It is a very effective technology transfer mechanism which receives even greater leverage through Canada's international collaboration with other countries via the International Energy Agency (IEA).

(c) The work on emerging technologies, such as nuclear fusion and biotechnology, is expected to produce direct energy benefits in the longer term. Furthermore, this work is expected to generate spin-off benefits in many other areas as the technologies are explored.

For information concerning OERD and PERD, contact:

B. Cook, Director General
Office of Energy Research and Development
Energy, Mines and Resources Canada
580 Booth Street
Ottawa, Ontario K1A 0E4
(613) 995-8860

Part 2 outlines PERD Tasks and Programs. General inquiries concerning Task activities should be directed to the OERD general contacts indicated. For more specific Program information, contacts at the lead departments and agencies are listed. Part 3 is a key to abbreviations and acronyms used in this Guide.

The Contracting Process

The private sector can access federal resources in several ways:

(1) through successful bidding on proposed projects and activities in response to calls for proposals from the federal government, generally by way of Requests for Proposals (RFPs), which are advertised at various times in the monthly R&D Bulletin published by Supply and Services Canada (SSC); such RFPs usually have specific timetables for submissions and require particular expertise and experience;

(2) through cost-shared energy technology development programs such as DRECT and IERD, which receive and address proposals directly (see Part 2, Task 1); and

(3) through unsolicited proposals, initiated by a proposer at any time and for which contracts may be let by SSC for energy R&D undertaken for specific client departments and agencies.

Persons interested in obtaining further information about the SSC contracting policies and procedures are invited to contact:

Don Coxon
Director, Science Branch
Science and Professional Services Directorate
Supply and Services Canada
Ottawa, Ontario
K1A 0S5
(819) 956-1788

Individuals and firms should request registration with the appropriate SSC managers for the various energy R&D areas. They should indicate their areas of interest, capabilities and experience, and ensure that their names are placed on the mailing lists for specific energy R&D areas. The appropriate person in the relevant program should also be contacted for suggestions and proposals for private sector R&D.

Funding in many programs and subprograms is allocated one or more years in advance to allow for effective management. In many cases contracts will therefore have already been let for a significant fraction of the resources available for the current fiscal year. Details of available funds may be obtained from appropriate staff in OERD or from the program manager.

Energy R&D proposals are required to meet the objectives shown in this Guide and must be sponsored or supported by one or more Canadian government departments.

Part 2: Outline of PERD Programs

Task 1 ENERGY EFFICIENCY

General Contact: P.B. Lumb, EMR/OERD (613) 996-6531
H.S. Mohamed, EMR/OERD (613) 995-5782

Principal Objective:

To promote the continuing development of a Canadian technology base for the efficient use of energy in all sectors of the economy.

Program	Technical Areas of Interest	Lead Departments and Agencies
1.1	Industrial Energy R&D (IERD) Program	
	. A cost-shared program with industry for the development of systems, services, products and process technology which can be used to increase the efficiency of energy use in all sectors of the economy.	D. Skinner EMR: EEB (613) 996-2480
1.2	Industry	
	. R&D on heat transfer and fluid flow and the development of computer programs for heat transfer equipment design and operation provided through the Heat Transfer and Fluid Flow Service (HTFS) to the process industries.	G. Wolgemuth AECL: HTFS (Chalk River) (613) 589-2707
	. Development and Demonstration of Resource and Energy Conservation Technology (DRECT): a cost shared program with industry for the recovery, in all sectors, of energy and other resources from waste.	G. Hill EC (613) 997-3405
	. National Incinerator Testing and Evaluation Program (NITEP): development of equipment designs and standards for municipal waste incineration with heat recovery.	A. Finkelstein EC (613) 995-1110
	. Process efficiency improvements in energy intensive industries, e.g., the pulp and paper industry.	G. Hill EC (613) 997-3405

	. Improved energy efficiency of municipal services with present emphasis on sewage treatment (dewatering, process control).	G. Speirs EC: WTC (Burlington) (416) 637-4745
	. Industrial process electro-technology (e.g., plasma arc technology) with emphasis on mineral processing.	J. Skeaff EMR: CANMET (613) 995-4246
	. Energy efficiency improvements in industrial minerals processing: cement, base metals, clay products.	F. Campbell EMR: CANMET (613) 996-5619
	. Efficiency of energy use through improved industrial combustion equipment.	A.C.S. Hayden EMR: CANMET (613) 996-3186
1.3	Agriculture and Food	
	. Energy efficiency in sustainable agricultural systems: zero and minimum tillage, fertilizers, fruit and vegetable storage and packaging, crop and animal husbandry, equipment performance, pesticide and fungicide use and alternatives, use of plant wastes, meat processing efficiency and food retailing.	P. Marriage AC (613) 995-7084
	. Fish harvesting and processing: vessel and gear fuel efficiency and operating systems improvements.	A. Duthie F&O (613) 990-0157
1.4	Buildings	
	. Residential heating systems (oil, gas and wood) - development, design, testing and standards, performance of degraded fuel oil.	A.C.S. Hayden EMR: CANMET (613) 996-3186
	. Residential buildings, chimneys, fireplaces and wood stoves - safety, efficiency.	J. White CMHC (613) 748-2309
	. Residential indoor air quality: survey protocols, guidelines, soil gases, drying of walls, ventilation, moisture transfer within structures.	J. White CMHC (613) 748-2309
	. Residential indoor air quality - R2000 homes.	M. Riley EMR (613) 995-2133
	. Commercial buildings heating and cooling: aquifer and ice storage, district energy systems.	E. Morofsky PWC (613) 998-3885

. Indoor air quality: health and comfort guidelines, testing protocols, health effects, surveys, toxicity testing, personal monitors.	R. Tobin PWC (613) 995-1503
. Commercial buildings: computerized design and analysis of building energy systems (BESA).	D. Seth PWC (613) 998-4560
. Commercial buildings: durable buildings.	M.S. Cheung PWC (613) 998-9238
. Commercial buildings lighting systems: visual performance, daylighting.	I. Pasini PWC (613) 998-1131
. Commercial buildings: energy management systems, intelligent buildings.	J. Ford PWC (613) 998-1120
. Commercial buildings: indoor air quality measurement, standards, guidelines, export systems, control strategies, performance verification.	R. Davidge PWC (613) 998-3786

1.5 Transportation

. Road fuel demand evaluation model. Heavy duty engine emissions testing and control technology evaluation. New light duty vehicles technology evaluation. Canadian motor vehicle fleet fuel demand analysis.	P. Reilly-Roe EMR (613) 996-6001
. Cold weather fuel economy - fuel consumption mathematical model. Nexus micro-vehicle.	M. Brenckmann TC (613) 998-1817
. Fuel economy in trucks and buses: energy optimization model, cryogenic refrigeration, modified combustion cycle, friction-reducing technologies, incrementally variable transmission, rolling resistance, bus suspension systems, bus HVAC system.	M. Brenckmann TC (613) 998-1817
. Transport systems: urban and freeway traffic control systems - AI software, optimum dispatching in multi-model systems, expert systems, tug/barge systems.	M. Brenckmann TC (613) 998-1817
. Air mode: turboprop engine design and testing, engine nacelle design, composite materials for aircraft structure, air traffic operations control systems.	M. Brenckmann TC (613) 998-1817

1.7 Energy Systems

. Industrial heat pumps: steam generating, non-azeotropic fluid mixtures, fossil fuel fired systems, ground source systems, ice slurry systems, waste heat recovery, chemical heat pumps, alternative refrigerants to chlorofluorohydrocarbons.	M. Wiggin EMR: CANMET (613) 996-8870
. District heating systems: ice slurry systems, hot water heat meters, additives to reduce fluid friction losses, thermal storage systems.	M. Wiggin EMR: CANMET (613) 996-8870

Task 2 COAL

General Contact: L.R. Muir, EMR/OERD (613) 995-5299
J.-M. Lamothe, EMR/OERD (613) 995-9454

Principal Objective:

To provide scientific and technological advances contributing to the safe, efficient and environmentally acceptable exploitation and use of Canadian coals.

Program	Technical Areas of Interest	Lead Departments and Agencies
2.1	Coal Technologies	
	. Resources and reserve assessment - development and testing of predictive computer models for assessing coal quality; resource analysis and characterization and trace elements in Canadian coals.	G. Smith EMR: GSC-ISPG (Calgary) (403) 284-0390 or G. Cameron EMR: GSC (613) 995-4182
	. Coal mining - mine environment monitoring and control of coal dust explosions; methane build-up in silos; underground coal mining, geotechnical engineering; improved productivity in open-pit mines through application of computerized central control.	D.B. Stewart EMR: CANMET (Devon) (403) 987-8238 or B.W. Konda EMR: CANMET (613) 995-4295
	. Preparation and transport - mobile dewatering and fine coal preparation plants; high-sulphur coal preparation (including magnetic separation); coal slurry transport; fine coal processing; process control; transport of coal.	H.A. Hamza EMR: CANMET (Devon) (403) 987-8217 (Transport: M. Brenckmann TC (613) 998-1817)

. Coal combustion performance characterization of low-grade coal; flame characteristics; fluidized bed combustion (FBC) of coal and other carbonaceous materials including pitch and coke; coal liquid mixtures; development of burners; industrial combustion applications; low NO_x control technologies; metallurgical coal technology development; gasification of coal.	D.A. Reeve EMR: CANMET (613) 996-6001 or D. Fung EMR: CANMET (613) 995-4295

2.2 Environment

. Coal mining and combustion - environmental protection criteria for mining and preparation facilities; slurry transportation; waste management practices and other environmental studies on flue-gas desulphurization, FBC and other advanced combusion technology applications.	W. Richardson EC (613) 994-5166 or S. Roussel EC (613) 953-5380

Task 3 FUSION

General Contact: P.B. Lumb, EMR/OERD (613) 996-6531
H.S. Mohamed, EMR/OERD (613) 995-5782

Principal Objective:

To develop a Canadian technological base for fusion power by participating in the cooperative international effort by supporting the development of specialized services.

Program	Technical Areas of Interest	Lead Departments and Agencies
	Nuclear Fusion	
	. Magnetic confinement - R&D activities at the Tokamak de Varennes experimental facility, jointly supported with IREQ (Hydro-Québec).	D. Jackson AECL (Chalk River) (613) 584-3175
	. Fusion materials/engineering through the Canadian Fusion Fuel Technology Project (CFFTP) - technology for the supply and handling of tritium for use as a fuel in experimental fusion reactors, jointly supported with Ontario Hydro.	D. Jackson AECL (Chalk River) (613) 584-3175
	. International participation and cooperation in projects and agreements covering R&D activities with the IEA and through bilateral collaborative activities with the U.S., Europe and Japan in areas such as plasma wall interaction radiation damage in materials used in fusion development and fuelling systems.	D. Jackson AECL (Chalk River) (613) 584-3175
	. Participation in the International Thermonuclear (fusion) Experimental Reactor (ITER), a joint project of EC, USA, USSR and Japan.	D. Jackson AECL (Chalk River) (613) 584-3175

Part 2: Outline of PERD Programs

Task 4 RENEWABLE ENERGY AND GENERIC ENVIRONMENT

General Contact: S.L. Bolcso, EMR/OERD (613) 995-2670
J.F. Legg, EMR/OERD (613) 995-0968

Principal Objective:

To encourage the development of science and technology to exploit biomass, solar, wind and other renewable energy resources and to investigate broad-scale environmental issues associated with energy developments.

Program	Technical Areas of Interest	Lead Departments and Agencies
4.1	Hydraulics	
	. To promote and develop methods and guidelines for exploiting low-head/small-scale hydro technologies; development of turbines, packaged units for remote communities; methodologies for site selection.	T. Tung EMR: TB (613) 996-6119
	. Examination of potential in Canada for ocean (salinity and temperature gradients, convective currents) and tidal flows; support for equipment development, innovative civil and hydraulic design and construction; computer models.	
4.2	Active Solar	
	. To support basic research in advanced concepts, technology improvements (materials, freeze protection methods, advanced controls, heat transfer, pumps/fluid flows, corrosion and system characterization); near-term product development via cost reductions and reliability/performance improvements; industry support services through standards development, technology research and service centres.	D. McClenahan EMR: TB (613) 996-6078
4.3	Passive Solar	
	. To support basic research; design tool development; product development (super windows, integrated mechanical/thermal storage systems), improved performance and cost.	S. Pnevmaticos EMR: TB (613) 995-6126

4.4 Photovoltaics

- Provide support for system/component development; system performance and evaluation/modeling; establishment of test facilities; fundamental research in thin film devices and amorphous silicon.

L. Vézina
EMR: TB
(613) 995-6079

4.5 Bioenergy

Substitution of biomass, including peat, for nonrenewable fuels and chemicals and conversion technology development for biomass to solid, liquid or gaseous fuels or chemicals with enhanced heating value, applicability, cleanliness, storage or transportability:

R.D. Hayes
EMR: TB
(613) 996-6227

- Preparation of feedstocks - materials handling, moisture content reduction (including mechanical dewatering), size modification, removal of non-biomass physical contaminants, development of feed mechanisms for biomass conversion process equipment.

- Support for development of small to medium scale biomass gasification systems, gas upgrading, waste disposal or other peripherals to gasification systems.

- Monitoring and development of process technologies for the anaerobic digestion of waste streams from the agrifood, municipal and general industry sectors.

- Development of novel biomass pretreatment, hydrolysis and fermentation techniques and associated control systems for the production of alcohol fuels and chemicals.

- Development of liquefaction processes to convert biomass into substitutes for petroleum-derived chemicals and fuels.

- Development of improved and/or retrofit direct combustion systems in municipal solid waste, residential wood burning appliances and industry applications. Environmental quality of emissions are also addressed.

- Development of techniques for harvesting and utilizing peat.

. Development work in biomass production, principally in productivity improvement (silviculture), environmental impacts and economic assessments as well as cooperation and participation in R&D activities of the IEA Bioenergy Agreement.	J. Richardson AC: CFS (819) 997-1107 (IEA: G. Page AC: CFS (819) 997-1107)

4.6 Wind

. Basic research for the development or improvement of computer models, simulation techniques, etc., for wind energy conversion systems (WECS).	M. Carpentier EMR: TB (613) 996-6120
. Technology development of equipment and systems to improve costs, performance, reliability and durability to meet Canadian and international markets.	
. Wind/diesel systems development and improvement, control systems, short-term storage systems, simulation techniques.	
. Technology testing and monitoring; support of test facilities (i.e., Atlantic Wind Test Site - AWTS).	
. Wind farm/arrays - to develop more efficient array controls; understanding of interactions between units and the grid.	

4.7 Geothermal

. Focussed efforts on work in geothermal energy extraction systems and support for technology/engineering development.	J. Cole EMR: TB (613) 996-9909

4.8 Generic Environment

Covers various generic environmental issues; not necessarily restricted to fossil fuel combustion.	P. Chénard EMR: OEA (613) 995-2833
. CO_2 advisory programs provide information and advice on the probable impacts of fossil fuels consumption on Canadian climate.	
. CO_2 flux and oceanic CO_2 measurement and transport - develop techniques for measurement and collect data to better understand the CO_2 fluxes between the atmosphere and the biosphere.	
. Develop methods to detect and confirm impending climate changes caused by energy related radiatively active gases (RAGS).	

Task 5 ALTERNATIVE TRANSPORTATION FUELS

General Contact: L. Vancea, EMR/OERD (613) 995-6145
J. Legg, EMR/OERD (613) 995-0968

Principal Objective:

To establish the technical and regulatory base for a transition to alternative transportation fuels in the next century, through the use of coal, bitumen, heavy oils, natural gas, biomass and electricity.

Program	Technical Areas of Interest	Lead Departments and Agencies
5.1	Hydrocarbons Enhancement	
	Bitumen and heavy oil upgrading, coprocessing of coal and bitumen, conversion of natural gas to liquid fuels:	
	. Coprocessing technology of coals with bitumen, heavy oils and residuals undertaken by CANMET as an extention of its hydrocracking process now being demonstrated in Petro-Canada's Montreal refinery.	J.M. Denis EMR: CANMET (613) 996-4926
	. Energy Conversion Program, a 50/50 cost-shared contracting out program dealing with coal liquefaction, combustion, gasification and bitumen recovery and upgrading.	C. Fairbridge EMR: CANMET (613) 992-7322
	. Development and demonstration of technologies for converting dry sewage sludge to liquid fuels.	H. Campbell EC: WIC (Burlington) (416) 336-4717
	. Upgrading bitumen/heavy oil residues - asphaltene conversion for viscosity reduction; catalytic pitch pyrolysis; catalytic hydrocracking and hydrotreating.	J.M. Denis EMR: CANMET (613) 996-4926
	. Process optimization at the 1 bbl/day scale of the CANMET hydrocracking process and R&D support for the 5000 bbl/day demonstration plant at Petro-Canada's Pointe-aux-Trembles refinery.	

. Welding process development including procedures for Canadian mill and field fabrication of thick-walled pressure vessels and for overlaying or cladding with protective alloy coatings; narrow gap, electron beam, electro-slag and laser welding processes.	J.T. McGrath EMR: CANMET (613) 992-3916
. Production of conventional and broad-specification fuels from conventional, heavy and synthetic crudes and processing of coal-derived liquids.	M. Wilson EMR: CANMET (613) 995-2379
. Conversion of natural gas to liquid fuels and catalyst development for the production of hydrocarbon fuels.	G. Jean EMR: CANMET (613) 995-4502

5.3 Bitumen and Oil Recovery

Technologies for bitumen and oil recovery and environmental aspects of these technologies:

. Mining and separation processes; in situ production techniques; oil/water emulsion breaking and treatment of effluent water.	C. Fairbridge EMR: CANMET (613) 992-7322
. Enhanced oil recovery.	
. Cooperative projects with AOSTRA on bitumen and heavy oil recovery.	
. Underground Test Facility.	

5.5 Fuel Use

. Substitution of new liquid fuels for conventional fuels in vehicular and stationary end-uses and technical support for regulations and specifications; includes research on handling and storage of propane, alcohols and natural gas for vehicles.	B.A. James EMR: TB (613) 996-5965
. Alternative Fuels Assistance Program.	

5.6 Hydrogen and Energy Storage

. Production, delivery, storage and use of hydrogen; electrochemistry associated with hydrogen systems, fuel cells and storage devices including batteries.	F. Németh EMR: TB (613) 996-8729

5.7 Environment

. Technologies to monitor and minimize environmental impacts of activities in the alternative fuels area.	J.D. McTaggart-Cowan EMR: OEA (613) 995-2833
. Oil sands/heavy oil - hydrogeological aspects of recovery operations; oil sands tailings and water treatment; treatment of water and sludge from in situ operations; abatement of acid gas emissions.	W. Richardson EC (613) 994-5166
. Toxicity studies and chemical identification of oil sands products; worker exposure to chemical hazards in the oil sands/heavy oil industry.	G. Wood HWC (613) 957-1503

Task 6 OIL, GAS AND ELECTRICITY

General Contact: L.R. Muir, EMR/OERD (613) 995-5299
J.M. Lamothe, EMR/OERD (613) 995-9454

Principal Objectives:

To ensure that the Government of Canada has, in cooperation with industry, the technical knowledge to discharge its responsibilities relating to the supply of light-medium crude oil and natural gas, principally from the frontiers.

To participate with utilities in developing electrical technologies.

Program	Technical Areas of Interest	Lead Departments and Agencies
6.1	Geoscientific R&D	
	Petroleum geoscience - models of petroleum generation, movement and accumulation; basin evolution, maturation, stability, seismic structure, geochemistry, and reservoir conditions.	R.P. Riddihough EMR: GSC (613) 995-4482
	. Permafrost and gas hydrates - natural gas hydrates, distribution, volume, hazard and control; permafrost development, identification, classification and behaviour.	R.P. Riddihough EMR: GSC (613) 995-4482 (Hydrates: A. Judge EMR: GSC (613) 996-9323)
6.2	Marine Engineering	
	. Environmental design criteria for marine structures - waves, ocean currents, ice, climatologies.	G. Youngblut EMR/INAC: COGLA (613) 993-1320
	. Safety technology for marine structures - emergency equipment, diving and sea-rescue techniques.	
	. Marine structures engineering - models of engineering processes.	
	. Ice-structure interaction.	

6.3 Offshore Geotechnics

- Integrated geological, geophysical, and geotechnical R&D conducted in cooperation with offshore operators to improve knowledge of seabed conditions for development and regulation; seismicity, ice-scouring, soil properties, subsea permafrost, sediment dynamics, geothermal characteristics, seabed stability, coastal processes, hazard identification.

S. Blasco
(Beaufort)
EMR: GSC-AGC
(902) 426-3932

D. Ross
(Atlantic)
EMR: GSC-AGC
(902) 426-3448

6.5 Materials

- Construction materials and fabrication, inspection and repair technologies for offshore hydrocarbon, exploration and production systems - steels and concrete; structural integrity monitoring; cost-shared industrial R&D on materials development and fabrication, inspection and repair technologies for offshore structures.

B. Faucher
EMR: CANMET
(613) 995-4295

6.6 Transportation of Oil and Gas

- Arctic navigation support systems, Atlantic and Arctic hydrography, improved navigation and positioning systems; transportation of hazardous energy commodities, Arctic class resource vessel performance, design and safety requirements.

M. Brenckmann
TC
(613) 998-1817

(Hydrography:
M. Casey
F&O: CHS
(613) 992-0017)

6.7 Environment

- Forecasting environmental conditions and understanding environmental processes in Canada's energy frontiers - weather, sea states, icebergs, currents, waves, radar, oil spills, waste treatment; environmental monitoring systems.

W. Richardson
EC: AES-EPS-ECS
(613) 994-5166

(Forecasting:
R. Stoddart
F&O: SCIENCE
(613) 990-0302)

6.8 Electrical R&D

- Support for the Canadian Electrical Association R&D Program, which covers generation, transmission, distribution, utilization and conservation.

M. Warnes
EMR: EEB
(613) 996-5193

M. Collins
NRC: DEE
(613) 993-2660

Part 3: Key to Abbreviations and Acronyms

AC	Agriculture Canada
AECL	Atomic Energy of Canada Ltd.
AES	Atmospheric Environmental Service (EC)
AGC	Atlantic Geoscience Centre - Bedford Institute of Oceanography (Dartmouth, EMR)
AOSTRA	Alberta Oil Sands Technology Research Authority
AWTS	Atlantic Wind Test Site
BDP	Bioenergy Development Program (EMR)
CANMET	Canada Centre for Mineral and Energy Technology (EMR)
CFFTP	Canadian Fusion Fuel Technology Project
CFS	Canadian Forestry Service
CHS	Canadian Hydrographic Service (F&O)
CMHC	Canada Mortgage and Housing Corporation
COGLA	Canada Oil and Gas Lands Administration (EMR/INAC)
DEE	Division of Electrical Engineering (NRC)
DRECT	Development and Demonstration of Resource and Energy Conservation Technology (EC)
EC	Environment Canada
ECS	Environmental Conservation Service (EC)
EEB	Electrical Energy Branch (EMR)
EMR	Energy, Mines and Resources Canada
EPS	Environmental Protection Service (EC)
ESRC	Engineering and Statistical Research Centre (AC)
F&O	Fisheries and Oceans
GSC	Geological Survey of Canada (EMR)
HWC	Health and Welfare Canada
IEA	International Energy Agency
IERD	Industrial Energy R&D Program (EMR)
INAC	Indian and Northern Affairs Canada
IREQ	Institut de recherche d'Hydro-Québec
ISPG	Institute of Sedimentary and Petroleum Geology (Calgary, EMR)
ITER	International Thermonuclear Experimental Reactor
NITEP	National Incinerator Testing and Evaluation Program
NRC	National Research Council
OEA	Office of Environmental Affairs, (EMR)
OERD	Office of Energy Research and Development (EMR)
PERD	Interdepartmental Panel on Energy Research and Development
PWC	Public Works Canada
SSC	Supply and Services Canada (also known as DSS)
TB	Technology Branch (EMR)
TC	Transport Canada
WTC	Wastewater Technology Centre (EC)