Science, Innovation and Electronic Information Division

Confidential when completed

Research and Development in Canadian Industry, 2002

Industrial Non-profit Organizations

Reporting organization name and address

Si vous préférez ce questionnaire en français veuillez cocher ☐

Please correct any mistakes in name or address

Note: This form has been designed for use by industrial research institutes, industrial associations and similar organizations performing or funding R&D on behalf of Canadian industry.

INFORMATION FOR RESPONDENTS

Survey objective

This survey collects data which are essential to assure the availability of pertinent statistical information to monitor science and technology related activities in Canada and to support the development of science and technology policy. Your data will be used for instance, to plan and evaluate research and development (R&D) incentive programs, to provide indicators on the state of industrial innovation, and to complete national totals for scientific R&D expenditures and personnel. The results of this survey will be published in **"Industrial Research and Development"** (Cat. No. 88-202-XIB) and **"Science Statistics"** (Cat. No. 88-001-XIB).

Authority

This survey is conducted under the authority of the Statistics Act, Revised Statutes of Canada, 1985, Chapter S19.

Legal requirement

Organizations are required to provide this information.

Confidentiality

Statistics Canada is prohibited from publishing any statistics which would divulge information relating to any identifiable organization without the previous written consent of that organization. The data reported on this questionnaire will be treated in strict confidence, used for statistical purposes and published in aggregated form only.

Federal-Provincial Agreement

In order to avoid duplication of enquiry, to reduce the cost of data collection and to provide consistent statistics, an agreement has been made with the Institut de la Statistique du Québec, under Section 11 of the Statistics Act, Statutes of Canada, where data on organizations located or having R&D activities in Québec will be transmitted to the Institut de la Statistique du Québec. The Statistics Act of Québec includes the same provisions for confidentiality and penalties for disclosure of information as the Canada Statistics Act.

Reporting period

This questionnaire should be completed for the **fiscal year ending in 2002.**

Reporting procedure

If the organization is basically devoted to R&D then consider the entire budget, including administration, and exclude only clearly distinguished non-R&D activities. Examples of such non-R&D activities might be the collection and dissemination of market and other economic information to members, the organization of conferences and training courses, grants to support trade fairs, or the operation of laboratories used only for testing and quality control. If R&D is only a minor part of the activities of this organization, then report only those expenditures and personnel associated with the R&D activity.

Please return the completed questionnaire within 30 days of receipt.

If you are unable to do so, please inform us of the expected completion date. If you receive more than one copy of this survey questionnaire for the same organization, please complete one and attach and return the duplicate(s). If you require assistance in the completion of this questionnaire or have any questions regarding the survey please address all enquiries to:

Science and Innovation Surveys Section
Science, Innovation and Electronic Information Division
Statistics Canada
Ottawa, Ontario
K1A 0T6
Telephone (613) 951-9662 (call collect)
FAX (613) 951-9920

R&D Definition

Research and development is systematic investigation carried out in the natural and engineering sciences by means of experiment or analysis to achieve a scientific or technological advance.

Research is original investigation undertaken on a systematic basis to gain new knowledge.

Development is the application of research findings or other scientific knowledge for the creation of new or significantly improved products or processes. If successful, development will usually result in devices or processes which represent an improvement in the "state of the art" and are likely to be patentable.

R&D as used in this survey, should be considered to be "Scientific Research and Experimental Development" as defined in Section 37 Regulation 2900 of the Income Tax Regulations.

Note: Although the definition of "Scientific Research and Experimental Development" is considered to be the same as R&D, certain expenditures for scientific research cannot be claimed for income tax purposes (e.g. land and buildings). All expenditures attributable to R&D are to be included in this survey.

CERTIFICATION

Name of person who completed this report *(please print):*		Business address:		
Official position:	Date:	Postal code:	Telephone No. ( ) –	Extension
Email address:	GST No. (BN No.)	Fax No. –		

Statistics Canada Statistique Canada

Canada

GENERAL DATA (questions 1 and 2)

1. a) ORGANIZATION'S FISCAL YEAR ENDING IN 2002 ▶ **FROM** 531 [2 0 |] [ ] [ ] (year / month / day) **TO** 532 [2 0 0 2] [ ] [ ] (year / month / day)

b) In the fiscal year ending in 2002, did your organization engage in R&D alliances with other organizations or firms? . . . . . **534** Yes ☐ or No ☐

2. TOTAL EXPENDITURES OF THIS ORGANIZATION IN 2002 (in thousands of Cdn $) ▶

DATA ON R&D PERFORMED (questions 3 to 6)

3. PERSONNEL OF THIS ORGANIZATION ENGAGED IN R&D (FULL-TIME EQUIVALENT*) (use rounded numbers only)

		Professionals								Supporting Staff*		**Total R&D personnel**
		Scientists and engineers				Senior R&D administrators				Technicians and technologists	Other	
		Bachelors	Masters	Doctorates	**Total**	Bachelors	Masters	Doctorates	**Total**			
a) In 2002		**082**	**083**	**084**		**085**	**086**	**087**		**088**	**089**	******
For 2002, please indicate % of males and females	**% M**											
	% F											
b) Planned for 2003												

* *See "Instruction Guide".*

** Divide wages and salaries for 2002 (Question 4(b) by total R&D personnel.
If the average R&D wages and salaries do not seem reasonable, please review the data.

▶ Average wages and salaries *(in thousands of Cdn $)*

4. EXPENDITURES FOR R&D PERFORMED WITHIN THIS ORGANIZATION IN CANADA (in thousands of Cdn $)

	CURRENT EXPENDITURES			**CAPITAL EXPENDITURES**				**Total**
	Wages and salaries*	Other current costs**	**Total current**	Land	Building	Equipment and Other	**Total capital**	
	(In thousands of Cdn $)							
a) Made in 2001	**001**	**002**		**009**	**010**	**011**		
b) Made in 2002	**003**	**004**		**012**	**013**	**014**		
c) Planned for 2003	**005**	**006**		**015**	**016**	**017**		
d) Forecast for 2004	**007**	**008**		**018**	**019**	**020**		

e) If applicable, please estimate the percentage of total R&D expenditures (reported above for 2002) attributable to software development*** . . . . . **308** %

f) If applicable, please estimate the percentage of total R&D expenditures (reported above for 2002) attributable to biotechnology*** . . . . . **309** %

g) If applicable, please estimate the percentage of total R&D expenditures (reported above for 2002) attributable to prevention, treatment and reuse of pollutants and wastes, and reduction of material and energy use . . . . . **314** %

h) Are there important potential environmental benefits related to the R&D reported for 2002 (apart from any R&D reported in question 4 g)?*** . . . . . **535** Yes ☐ or No ☐

i) If applicable, please estimate the percentage of total R&D expenditures (reported above for 2002) attributable to advanced materials*** . . . . . **537** %

* *Include fringe benefits of persons engaged in R&D.*

** *Include contracts for services required to carry out R&D (e.g. contracts awarded for drilling needed for heavy oil R&D). Exclude contracts for R&D work itself which should be reported in question 8.* ***Exclude capital depreciation.***

*** *See "Instruction Guide".*

5. REGIONAL INFORMATION ON R&D IN 2002 (Expenditures should be reported in thousands of Cdn $)

Region where R&D was performed	Number of R & D Establishment (count*)	R&D expenditures		R&D personnel	
		Current	Capital	Professionnals	Supporting Staff
		($000)		**(Full-time equivalent)**	
Specify province:					
Specify province:					
Specify province:					
Total ***(Equal to 2002 expenditures and personnel reported in Question 4 b) and 3 a)***					

* *Please complete Question 7, for each establishment identified above.*

6. SOURCES OF FUNDS FOR R&D PERFORMED WITHIN THIS ORGANIZATION IN 2002 (in thousands of Cdn $)

	Canadian sources	Non-Canadian sources
a) This organization (i.e. interest and other income)	021	022
(i) Please indicate % of a) which were provided by venture capital firms	%	%

b) Member companies *(annual fees, sustaining grants)*

Name of companies *(Please print full legal name and attach additional sheet if necessary)*		
325	335	345
326	336	346
327	337	347
328	338	348
329	339	349
330	340	350
331	341	351
332	342	352
333	343	353
334	344	354
Sub-total (b)	023	024

c) Companies (R&D contract work)

Name of companies *(Please print full legal name and attach additional sheet if necessary)*		
355	365	375
356	366	376
357	367	377
358	368	378
359	369	379
360	370	380
361	371	381
362	372	382
363	373	383
364	374	384
Sub-total (c)	028	029

d) Canadian Federal Government through:
(i) R&D grants and the R&D portion only of any other grants

Industry Canada: (specify)	166	
National Research Council: Industrial Research Assistance Program	163	
Atlantic Canada Opportunities Agency		
Canada Economic Development (Québec Regions)		
Western Economic Diversification Office		
Other grant programs: *(specify)*		
(specify)		
Sub-total (d i)	027	

(ii) **R&D contracts** and the R&D **portion only** of any other contracts

Contracting departments *(Payments are often made through Public Works and Government Services Canada for other departments; please specify contracting department)*		
Sub-total (d ii)	026	

e) Provincial governments (i.e. grants and contracts. Attach additional sheet if necessary).

Specify province		
Sub-total (e)	291	

f) Others (eg: Universities) (Specify)	387	387
Sub-totals (a to f)		

Total (equal to the 2002 expenditures of Question (4 b) . . . . . .

NATURE OF R&D ACTIVITIES - 2002 (question 7)

Please complete for each R&D establishment (previously identified in question 5). If you have more than one R&D establishment, please photocopy this section and complete for each R&D establishment.

7. R&D Establishment No. ☐ (for example: 1, 2, 3, etc).

Name of R&D establishment:

Address of R&D establishment:

Street | City

Province | Postal code

Contact:

Name | Position title | ( ) Telephone no.

1. What were the current (non-capital) R&D Expenditures of this R&D establishment in 2002? (the total amounts reported for all R&D establishments should equal the total of cells 003 and 004 in question 4)	(in thousands of Cdn $)
2. How many scientists and engineers (full-time equivalent) were employed in this R&D establishment in 2002? (the total amounts reported for all R&D establishments should equal the total of cells 082 to 084 in question 3)	(Full time equivalence)

3 Please estimate, in terms of the percentage of the current R&D expenditures, the approximate distribution of your R&D effort in 2002:

A. Basic research (no specific practical application in view)	%
B. Applied research (with a specific practical application in view)	%
C. New * product development	%
D. Existing * product improvement	%
E. New * process development	%
F. Existing * process improvement	%
G. New * technical services development	%
H. Existing * technical services improvement	**100%**

* *Please consider new to mean totally or essentially new/unknown to the personnel of your R&D establishment. The product, process or service may exist elsewhere in the world but your R&D is not aided by this fact since your personnel do not have access to the information necessary to avoid any of the normal risks of development. Existing would mean that your staff would be improving a product/process/service about which they have the basic information - the product/process/service need not already be provided by your company.*

DATA ON PAYMENTS FOR R&D (questions 8 and 9)

8. PAYMENTS FOR R&D PERFORMED BY OTHER ORGANIZATIONS (in thousands of Cdn $)

a) Made in 2001	038
b) Made in 2002	039
c) Planned for 2003	040
d) Forecast for 2004	041

9. RECIPIENTS OF PAYMENTS FOR R&D PERFORMED IN 2002 BY OTHER ORGANIZATIONS (in thousands of Cdn $)

	In Canada	Outside Canada
a) Companies		
b) Universities		
c) Other		
Sub-totals (a to c)		

Total (equal to figure entered in 8 (b)) ☐

DATA ON OTHER PAYMENTS MADE OR RECEIVED FOR TECHNOLOGY (question 10)

10. PAYMENTS MADE OR RECEIVED IN 2002 BY THIS ORGANIZATION FOR PATENTS (SALE/PURCHASE, LICENSING), KNOW-HOW (UNPATENTED), INVENTIONS, TRADEMARKS (INCLUDING FRANCHISING), PATTERNS, DESIGN, AND R&D TECHNICAL ASSISTANCE (in thousands of Cdn $)

	In Canada	Outside Canada
a) Payments	102	104
b) **Receipts**	106	108

DATA ON ENERGY R&D (question 11)

11. IN 2002, DID THIS REPORTING UNIT PERFORM OR FUND ANY **ENERGY R&D**?

☐ **Yes** ▶ **Please complete the enclosed "Energy R&D expenditures by area of technology" (green) questionnaire.**

☐ **No** ▶ **Please complete certification on page 2 and return questionnaires.**

INSTRUCTION GUIDE

Generally speaking, industrial R&D is intended to result in an invention which may subsequently become a technological innovation. An essential requirement is that the outcome of the work is uncertain, i.e., that the attainment of a given technical objective cannot be known in advance on the basis of current knowledge or experience. Hence much of the work done by scientists and engineers is not R&D since they are primarily engaged in "routine" production, engineering, quality control testing. Although they apply scientific or engineering principles their work is not directed towards the discovery of new knowledge or the development of new products and processes. However, work elements which are not considered R&D by themselves but which directly support R&D projects, should be included with R&D in these cases. Examples of such work elements are design and engineering, shop work, computer programming, and secretarial work.

R&D Alliance – Agreement where two or more firms or organizations engage in a joint R&D project.

Full-Time Equivalent (FTE) – R&D may be carried out by persons who work solely on R&D projects or by persons who devote only part of their time to R&D, and the balance to other activities such as testing, quality control and production engineering. To arrive at the total effort devoted to R&D in terms of manpower, it is necessary to estimate the full-time equivalent of these persons working only part-time in R&D.

FTE = Number of persons who work solely on R&D projects + the estimate of time of persons working only part of their time on R&D.

Example calculation: If out of five scientists engaged in R&D work, one works solely on R&D projects and the remaining four devote only one quarter of their working time to R&D, then: FTE = 1 + 1/4 + 1/4 + 1/4 + 1/4= 2 scientists.

Supporting Staff

Technicians and technologists – Technically trained personnel who assists scientists and engineers in R&D, e.g. chemical technicians, draftspersons. They may be certified by either provincial educational authorities or by provincial or national scientific or engineering associations.

Others – Personnel directly engaged in the R&D program, e.g. machinists and electricians in construction of prototypes, or clerks, typists, accountants and storekeepers engaged in the administration or clerical support of R&D units.

Software Development – Software refers to the encoded instructions executed by electronic devices including computers for performing operations and functions. See **Revenue Canada's Information Circular 97-1** "Administrative Guidelines for Software Development".

Biotechnology – Biotechnology is defined as "The application of S&T to living organisms as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services." Eg. DNA genomics, pharmaco-genetics gene probes, DNA sequencing/synthesis/amplification, genetic engineering. Protein/peptide sequencing/synthesis, lipid/protein engineering, proteomics, hormones and growth factors, cell receptors/signalling/pheromones. Cell & tissue culture, tissue engineering, hybridisation, cellular fusion, vaccine/immune stimulants, embryo manipulation, bioreactors, fermentation, bioprocessing, bioleaching, bio-pulping, bio-bleaching, biodesulphurization, bioremediation, and biofiltration, gene therapy, viral vectors, bioinformatics.

Environmental Protection – Environmental protection is defined as the field of work devoted to the reduction or elimination of pollutants and wastes (including prevention, treatment and reuse of pollutants and wastes, and reduction of material and energy use). Expenditures made in order to improve employee health and workplace safety are excluded.

Environmental benefits – Environmental benefits include potential energy savings and the reduction in raw materials use or waste generation either from increased efficiency, recycling or closed-loop systems. They can also include design changes resulting in products that are less damaging to the environment in their use or disposal.

R&D in advanced materials – R&D in advanced materials is defined as the systematic investigation carried out in the natural and engineering sciences by means of experiment or analysis in order to gain new knowledge and create new or significantly improved products or processes which use advanced materials such as metals (including superalloys or high purity metals), ceramics and carbon (including optoelectronics such as optical fibres and carbon and graphite products) and polymers (including high performance reinforced plastics and other high performance polymers).

COMMENTS

Reasons for Major Changes in Reported Expenditures and Personnel – *In order to eliminate the necessity to verify discrepancies between this report and your last return (2001) please explain any significant changes which might be misconstrued as an error in reporting.*

The results of this survey will be published in "Industrial Research and Development" (Cat. No. 88-202-XIB) and "Science Statistics" (Cat. No. 88-001-XIB).
http://www.statcan.ca/english/IPS/Data/88-202-XIB.htm
http://www.statcan.ca/english/IPS/Data/88-001-XIB.htm

THANK YOU FOR YOUR CO-OPERATION