

## 2021 Annual Survey of Research and Development in Canadian Industry

**CONFIDENTIAL once completed.**

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This information is collected under the authority of the *Statistics Act*, Revised Statutes of Canada, 1985, Chapter S-19.  
**COMPLETION OF THIS QUESTIONNAIRE IS A LEGAL REQUIREMENT UNDER THIS ACT.**

### Introduction

#### Survey purpose

This survey collects information on scientific activities of Canadian businesses. The research and development expenditures and personnel information is used by federal, provincial and territorial governments and agencies, academics, trade associations and international organizations for statistical analyses and policy purposes. These data also contribute to national totals of research and development activities. The payments and receipts information is used by these agencies to monitor knowledge flows across international borders and between Canadian businesses.

Your information may also be used by Statistics Canada for other statistical and research purposes.

#### Security of emails and faxes

Statistics Canada advises you that there could be a risk of disclosure during facsimile or email. However, upon receipt, Statistics Canada will provide the guaranteed level of protection afforded all information collected under the authority of the *Statistics Act*.

**Note:** Our online questionnaires are secure, there is no risk of data interception when responding to Statistics Canada online surveys.

#### Confidentiality

The *Statistics Act* protects the confidentiality of information collected by Statistics Canada.

#### Data-sharing agreements

To reduce respondent burden, Statistics Canada has entered into data-sharing agreements with provincial and territorial statistical agencies and other government organizations, which have agreed to keep the data confidential and use them only for statistical purposes.

Information on confidentiality, data-sharing agreements and record linkages can be found on the last page of this questionnaire.

**Please return the questionnaire within 21 days.**

**Please mail the completed questionnaire in the enclosed envelope or fax it to Statistics Canada at 1-888-883-7999.**

If you are unable to complete within 21 days **OR** if you need help, call us at **1-877-949-9492** or **TTY 1-800-363-7629**.

Statistics Canada  
Operations and Integration Division  
150 Tunney's Pasture Driveway  
Ottawa, Ontario K1A 0T6

**Visit our website, [www.statcan.gc.ca](http://www.statcan.gc.ca)**

## Reporting instructions

- Please print in ink.
- Report dollar amounts in **thousands of Canadian dollars**.
- **Exclude** sales tax.
- Percentages should be rounded to whole numbers.
- Do not report dollars in decimals. Round all values to the nearest whole number.
- When precise figures are not available, provide your best estimates.
- If this business **performs in-house R&D** and **outsources R&D**, complete **all** questions.
- If this business **performs in-house R&D** and **does not outsource R&D**, complete questions 1-5, 8-21.
- If this business **outsources R&D** and **does not perform in-house R&D**, complete questions 1-3, 5-7, 12 & 16-21.
- If this business **does not perform in-house R&D** and **does not outsource R&D**, complete questions 1-3, 5, 12, 16, 17 & 19-21
- Consult the reporting guide at [www.statcan.gc.ca/guides-e](http://www.statcan.gc.ca/guides-e) for further information.

## Business or organization and contact information

1. **Verify or provide** the business or organization's **legal and operating name** and correct where needed.

**Note:** Legal name modifications should only be done to correct a spelling error or typo.

Legal name

Operating name (if applicable)

2. **Verify or provide the contact information** of the designated business or organization **contact person** for this questionnaire and correct where needed.

**Note:** The designated contact person is the person who should receive this questionnaire. The designated contact person may not always be the one who actually completes the questionnaire.

First name

Last name

Title

Preferred language of communication

English

French

Mailing address (number and street)

City

Province, territory or state

Postal code or ZIP code

Example: A9A 9A9 or 12345 1234

Country

Email address

Example: user@example.gov.ca

Telephone number (including area code)

Example: 123-123-1234

Extension number  
(if applicable)

Fax number (including area code)

Example: 123-123-1234

3. **Verify or provide the current operational status** of the business or organization identified by the legal and operating name above.

B00323

1  Operational → **Go to question 4**

2  Not currently operational

e.g., temporarily or permanently closed, change of ownership

Why is this business or organization not currently operational?

B00309

2  Seasonal operations → **Go to question 3a**

3  Ceased operations → **Go to question 3b**

4  Sold operations → **Go to question 3c**

5  Amalgamated with other businesses or organizations → **Go to question 3d**

6  Temporarily inactive but will re-open → **Go to question 3e**

7  No longer operating due to other reasons → **Go to question 3f**

### 3a. Seasonal operations

When did this business or organization close for the season?

Date B00217  
YYYY MM DD

When does this business or organization expect to resume operations?

Date B00218  
YYYY MM DD → **Go to question 4**

### 3b. Ceased operations

When did this business or organization cease operations?

Date B00211  
YYYY MM DD

Why did this business or organization cease operations?

B00311

1  Bankruptcy

2  Liquidation

3  Dissolution

4  Other  
Specify the other reasons why the operations ceased

B00312

→ **Go to question 4**

3c. Sold operations

When was this business or organization sold?

YYYY MM DD  
B00212

What is the legal name of the buyer?

B00406

→ Go to question 4

3d. Amalgamated with other businesses or organizations

When did this business or organization amalgamate?

YYYY MM DD  
B00213

What is the legal name of the resulting or continuing business or organization?

B00407

What are the legal names of the other amalgamated businesses or organizations?

B00408

→ Go to question 4

3e. Temporarily inactive but will re-open

When did this business or organization become temporarily inactive?

YYYY MM DD  
B00214

When does this business or organization expect to resume operations?

YYYY MM DD  
B00215

Why is this business or organization temporarily inactive?

B00313

→ Go to question 4

3f. No longer operating due to other reasons

When did this business or organization cease operations?

YYYY MM DD  
B00216

Why did this business or organization cease operations?

B00314

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4. **Verify or provide the current main activity** of the business or organization identified by the legal and operating name.

**Note:** The described activity was assigned using the North American Industry Classification System (NAICS).

B05002

1  This is the current main activity → **Go to next section**

2  This **is not** the current main activity  
Provide a **brief but precise description** of this business or organization's **main activity**  
e.g., breakfast cereal manufacturing, shoe store, software development

B05003

5. Was this business or organization's main activity ever classified as:

B05111

1  Yes

2  No → **Go to next section**

6. When did the main activity change?

Date B00219

YYYY	MM	DD
<input type="text"/>	<input type="text"/>	<input type="text"/>

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## Business characteristics

### Reporting period

1. What is the end date of this business's fiscal year? .....

	YYYY	MM	DD
B00206	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Note:** For this survey, **this business's** fiscal year end date should fall **on or before March 31, 2022**.

Here are **some examples** of fiscal periods that **fall within the targeted dates**:

- May 1, 2020 to **April 30, 2021**
- July 1, 2020 to **June 30, 2021**
- October 1, 2020 to **September 30, 2021**
- January 1, 2021 to **December 31, 2021**
- February 1, 2021 to **January 31, 2022**
- April 1, 2021 to **March 31, 2022**

\*THIS FISCAL YEAR WILL BE REFERRED TO AS **2021** THROUGHOUT THE QUESTIONNAIRE

### Business status

2. What is this business's GST number (9-digit business number)? .....

B00419	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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### Before you begin

#### **Differences between Scientific Research and Experimental Development (SR&ED) tax incentive program and this survey**

**Include** the following expenditures in this survey:

- capital **R&D** expenditures
- **R&D** expenditures in the social sciences and humanities
- payments for **R&D** performed by other organizations outside Canada.

#### **For this survey**

##### **'In-house R&D'** refers to

Expenditures **within Canada** for **R&D** performed **within this business** by:

- employees (permanent, temporary or casual)
- self-employed individuals or contractors who are **working on-site** on this business's **R&D** projects.

##### **'Outsourced R&D'** refers to

Payments made **within or outside Canada** to other businesses, organizations or individuals to fund **R&D** performance:

- grants
- fellowships
- contracts.

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## In-house research and development (R&D) expenditures

3. In 2021, 2022 and 2023, did this business have or does it plan to have expenditures for **R&D performed in-house** within Canada?

**Exclude** payments for outsourced (contracted out or granted) **R&D**, which should be reported in question 6.

<sup>1</sup>  Yes

<sup>2</sup>  No → Go to question 5

4. In 2021, 2022 and 2023, what are this business's actual and planned expenditures for **R&D performed in-house** within Canada?

Please report all amounts in **thousands** of Canadian dollars.

Report '0' for no R&D expenditures.

	Made in 2021	Planned in 2022	Planned in 2023
	CAN\$ '000	CAN\$ '000	CAN\$ '000
<b>Current in-house R&amp;D expenditures within Canada</b>			
a. Wages, salaries of permanent, temporary and casual <b>R&amp;D</b> employees <b>Include</b> fringe benefits . . . . .	E45077_sr1 \$ [ ] ,000		
b. Services to support <b>R&amp;D</b> <b>Include</b> services of self-employed individuals or contractors who are working on-site on this business's <b>R&amp;D</b> projects. <b>Exclude</b> contracted out or granted expenditures to other organizations to perform <b>R&amp;D</b> (report in question 6) . . . . .	E45077_sr2 \$ [ ] ,000		
c. <b>R&amp;D</b> materials . . . . .	E45077_sr3 \$ [ ] ,000		
d. All other current <b>R&amp;D</b> costs <b>Include</b> overhead costs . . . . .	E45077_sr4 \$ [ ] ,000		
<b>Total current in-house R&amp;D expenditures within Canada</b>	E45050 \$ [ ] ,000	E45079 \$ [ ] ,000	E45082 \$ [ ] ,000
<b>Capital in-house R&amp;D expenditures within Canada</b>			
e. Software <b>Exclude</b> capital depreciation . . . . .	E45078_sr1 \$ [ ] ,000		
f. Land <b>Exclude</b> capital depreciation . . . . .	E45078_sr2 \$ [ ] ,000		
g. Buildings and structures <b>Exclude</b> capital depreciation . . . . .	E45078_sr3 \$ [ ] ,000		
h. Equipment, machinery and all other capital <b>Exclude</b> capital depreciation . . . . .	E45078_sr4 \$ [ ] ,000		
<b>2021 - Total capital in-house R&amp;D expenditures within Canada</b>	E45060 \$ [ ] ,000	E45081 \$ [ ] ,000	E45083 \$ [ ] ,000
<b>2021 - Total in-house R&amp;D expenditures within Canada</b>	E45070 \$ [ ] ,000		

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### Outsourced (contracted out or granted) R&D expenditures

5. In 2021, did this business have **outsourced** (contracted out or granted) **R&D expenditures** within Canada or outside Canada?

- Include:**
- funding or grants provided to other organizations to perform **R&D**.
  - contracted out expenditures for **R&D**

**Exclude** services of self-employed individuals or contractors who are working on-site on this business's **R&D** projects, which should have been reported earlier as part of in-house **R&D** expenditures in question 4.

B05152\_tp 1  Yes

2  No → **Go to question 7**

6. In 2021, what were this business's **outsourced** (contracted out or granted) **R&D expenditures** within Canada or outside Canada?

Please report all amounts in **thousands** of Canadian dollars.  
Report '0' for no R&D expenditures.

	Within Canada CAN\$ '000	Outside Canada CAN\$ '000
a. Parent, affiliated and subsidiary companies .....	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
b. Other companies .....	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
c. Private non-profit organizations .....	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
d. Industrial research institutes or associations .....	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
e. Hospitals .....	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
f. Universities .....	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
g. Federal government departments and agencies .....	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
h. Provincial or territorial government departments, ministries and agencies .....	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
i. Provincial or territorial research organizations .....	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
j. Other organizations e.g., individuals, non-university educational institutions, foreign governments .....	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
<b>2021 - Total outsourced (contracted out or granted) R&amp;D expenditures</b>	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000

7. In 2022 and 2023, what are this business's **planned outsourced** (contracted out or granted) **R&D expenditures** within Canada or outside Canada?

Please report all amounts in **thousands** of Canadian dollars.  
Report '0' for no R&D expenditures.

	Within Canada CAN\$ '000	Outside Canada CAN\$ '000
<b>2022 - Total outsourced (contracted out or granted) R&amp;D expenditures</b>	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
<b>2023 - Total outsourced (contracted out or granted) R&amp;D expenditures</b>	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000





## Geographic distribution of in-house R&D expenditures within Canada in 2021

8. In 2021, how were this business's total expenditures for R&D performed in-house distributed by province or territory?

**Exclude:**

- payments for outsourced (contracted out or granted) R&D, which should be reported in question 6
- capital depreciation.

Please report all amounts in **thousands** of Canadian dollars.

**Current in-house  
R&D expenditures**

**Capital in-house  
R&D expenditures**

	CAN\$ '000	CAN\$ '000
a. Newfoundland and Labrador	E45077_g1 \$ <input type="text"/> ,000	E45078_g1 \$ <input type="text"/> ,000
b. Prince Edward Island	E45077_g2 \$ <input type="text"/> ,000	E45078_g2 \$ <input type="text"/> ,000
c. Nova Scotia	E45077_g3 \$ <input type="text"/> ,000	E45078_g3 \$ <input type="text"/> ,000
d. New Brunswick	E45077_g4 \$ <input type="text"/> ,000	E45078_g4 \$ <input type="text"/> ,000
e. Quebec	E45077_g5 \$ <input type="text"/> ,000	E45078_g5 \$ <input type="text"/> ,000
f. Ontario	E45077_g6 \$ <input type="text"/> ,000	E45078_g6 \$ <input type="text"/> ,000
g. Manitoba	E45077_g7 \$ <input type="text"/> ,000	E45078_g7 \$ <input type="text"/> ,000
h. Saskatchewan	E45077_g8 \$ <input type="text"/> ,000	E45078_g8 \$ <input type="text"/> ,000
i. Alberta	E45077_g9 \$ <input type="text"/> ,000	E45078_g9 \$ <input type="text"/> ,000
j. British Columbia	E45077_g10 \$ <input type="text"/> ,000	E45078_g10 \$ <input type="text"/> ,000
k. Yukon	E45077_g11 \$ <input type="text"/> ,000	E45078_g11 \$ <input type="text"/> ,000
l. Northwest Territories	E45077_g12 \$ <input type="text"/> ,000	E45078_g12 \$ <input type="text"/> ,000
m. Nunavut	E45077_g13 \$ <input type="text"/> ,000	E45078_g13 \$ <input type="text"/> ,000
<b>2021 - Total current and capital in-house R&amp;D expenditures</b>	E45100 \$ <input type="text"/> ,000	E45110 \$ <input type="text"/> ,000

▲  
**Should equal  
total current  
in-house R&D  
expenditures  
from question 4**

▲  
**Should equal  
total capital  
in-house R&D  
expenditures  
from question 4**

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**Sources of funds for in-house R&D expenditures in 2021**

9. In 2021, what were the sources of funds for this business's total expenditures for R&D performed in-house?

**Include** Canadian and foreign sources.

**Exclude:** • payments for outsourced (contracted out or granted) R&D, which should be reported in question 6  
• capital depreciation.

Please report all amounts in **thousands** of Canadian dollars.

**Report '0' for no R&D expenditures.**

	From within Canada	From outside Canada
	CAN\$ '000	CAN\$ '000
a. Funds from this business		
<b>Include</b> interest payments, other income and funding or tax credits from tax incentives. . . . .	E64047 \$ [ ] ,000	E63037 \$ [ ] ,000
b. Funds from parent, affiliated and subsidiary companies . . . . .	E65337 \$ [ ] ,000	E63044 \$ [ ] ,000
c. Federal government grants or funding		
<b>Include</b> R&D grants or funding or R&D portion only of other grants or funding . . . . .	E64048 \$ [ ] ,000	
d. Federal government contracts		
<b>Include</b> R&D contracts or R&D portion only of other contracts . . . . .	E65049 \$ [ ] ,000	

**R&D contract work for companies**

**Business 1**

	From within Canada	From outside Canada
	CAN\$ '000	CAN\$ '000
e. <b>GST</b> number (9-digit business number (BN) or charitable registration number)		
B71014_nc1 [ ]	E65048_nc1 \$ [ ] ,000	E63038_nc1 \$ [ ] ,000
Legal name B71014_nc2 [ ]		

**Business 2**

f. <b>GST</b> number (9-digit business number (BN) or charitable registration number)		
B71014_nc3 [ ]	E65048_nc2 \$ [ ] ,000	E63038_nc2 \$ [ ] ,000
Legal name B71014_nc4 [ ]		

**Business 3**

g. <b>GST</b> number (9-digit business number (BN) or charitable registration number)		
B71014_nc5 [ ]	E65048_nc3 \$ [ ] ,000	E63038_nc3 \$ [ ] ,000
Legal name B71014_nc6 [ ]		

**Business 4**

h. <b>GST</b> number (9-digit business number (BN) or charitable registration number)		
B71014_nc7 [ ]	E65048_nc4 \$ [ ] ,000	E63038_nc4 \$ [ ] ,000
Legal name B71014_nc8 [ ]		

i. Other contracts not listed above	E65048_nc5 \$ [ ] ,000	E63038_nc5 \$ [ ] ,000
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## Geographic distribution of provincial or territorial government grants or funding and provincial or territorial government contracts

Include R&D grants/contracts or R&D portion only of other grants/contracts.

Provincial or territorial  
government grants  
or funding

Provincial or territorial  
government contracts

	CAN\$ '000	CAN\$ '000
	E64049_g1	E65051_g1
j. Newfoundland and Labrador .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g2	E65051_g2
k. Prince Edward Island .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g3	E65051_g3
l. Nova Scotia .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g4	E65051_g4
m. New Brunswick .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g5	E65051_g5
n. Quebec .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g6	E65051_g6
o. Ontario .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g7	E65051_g7
p. Manitoba .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g8	E65051_g8
q. Saskatchewan .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g9	E65051_g9
r. Alberta .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g10	E65051_g10
s. British Columbia .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g11	E65051_g11
t. Yukon .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g12	E65051_g12
u. Northwest Territories .....	\$ [ ] ,000	\$ [ ] ,000
	E64049_g13	E65051_g13
v. Nunavut .....	\$ [ ] ,000	\$ [ ] ,000

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## R&D contract work for private non-profit organizations

From within Canada

From outside Canada

CAN\$ '000

CAN\$ '000

### Organization 1

- w. **GST** number (9-digit business number (BN) or charitable registration number)

B71013\_nc1

E65052\_nc1

\$  ,000

E63039\_nc1

\$  ,000

Organization name

B71013\_nc2

### Organization 2

- x. **GST** number (9-digit business number (BN) or charitable registration number)

B71013\_nc3

E65052\_nc2

\$  ,000

E63039\_nc2

\$  ,000

Organization name

B71013\_nc4

### Organization 3

- y. **GST** number (9-digit business number (BN) or charitable registration number)

B71013\_nc5

E65052\_nc3

\$  ,000

E63039\_nc3

\$  ,000

Organization name

B71013\_nc6

- z. Other sources  
e.g., universities, foreign governments, individuals

E64051

\$  ,000

E63041

\$  ,000

**2021 - Total in-house R&D expenditures by sources of funds by origin (sum of questions a. to z.)**

E60310

\$  ,000

E60320

\$  ,000

**2021 - Total in-house R&D expenditures (Canadian and foreign sources) (should equal total in-house R&D expenditures from question 4)**

E60330

\$  ,000

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**Fields of research and development for in-house R&D expenditures within Canada in 2021**

10. In 2021, how were this business's total expenditures for R&D performed in-house within Canada distributed by field(s) of research and development?

- Exclude:**
- payments for outsourced (contracted out or granted) R&D, which should be reported in question 6
  - capital depreciation.

Please report all amounts in **thousands** of Canadian dollars.

**Report '0' for no R&D expenditures.**

**Natural and formal sciences**

**Exclude** computer sciences, information technology and bioinformatics (to be reported at lines s. and t.).

**CAN\$ '000**

a. Mathematics .....	\$	<input type="text"/>	,000
		E45092_y1	
b. Physical sciences .....	\$	<input type="text"/>	,000
		E45092_y2	
c. Chemical sciences .....	\$	<input type="text"/>	,000
		E45092_y3	
d. Earth and related environmental sciences .....	\$	<input type="text"/>	,000
		E45092_y4	
e. Biological sciences .....	\$	<input type="text"/>	,000
		E45092_y5	
f. Other natural sciences .....	\$	<input type="text"/>	,000
		E45092_y6	
<b>Total natural and formal sciences</b>	\$	<input type="text"/>	,000
		E45085	

**Engineering and technology**

**Exclude** software engineering and technology (to be reported at line r.).

**CAN\$ '000**

g. Civil engineering .....	\$	<input type="text"/>	,000
		E45093_y1	
h. Electrical engineering, electronic engineering and communications technology .....	\$	<input type="text"/>	,000
		E45093_y2	
i. Mechanical engineering .....	\$	<input type="text"/>	,000
		E45093_y3	
j. Chemical engineering .....	\$	<input type="text"/>	,000
		E45093_y4	
k. Materials engineering .....	\$	<input type="text"/>	,000
		E45093_y5	
l. Medical engineering .....	\$	<input type="text"/>	,000
		E45093_y6	
m. Environmental engineering .....	\$	<input type="text"/>	,000
		E45093_y7	
n. Environmental biotechnology .....	\$	<input type="text"/>	,000
		E45093_y8	
o. Industrial biotechnology .....	\$	<input type="text"/>	,000
		E45093_y9	
p. Nanotechnology .....	\$	<input type="text"/>	,000
		E45093_y10	
q. Other engineering and technologies .....	\$	<input type="text"/>	,000
		E45093_y11	
<b>Total engineering and technology</b>	\$	<input type="text"/>	,000
		E45086	

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**Software-related sciences and technology**

CAN\$ '000

r. Software engineering and technology .....	\$	<input type="text"/>	,000
s. Computer sciences .....	\$	<input type="text"/>	,000
t. Information technology and bioinformatics .....	\$	<input type="text"/>	,000
<b>Total software-related sciences and technology</b>	\$	<input type="text"/>	,000

**Medical and health sciences**

u. Basic medicine .....	\$	<input type="text"/>	,000
v. Clinical medicine .....	\$	<input type="text"/>	,000
w. Health sciences .....	\$	<input type="text"/>	,000
x. Medical biotechnology .....	\$	<input type="text"/>	,000
y. Other medical sciences .....	\$	<input type="text"/>	,000
<b>Total medical and health sciences</b>	\$	<input type="text"/>	,000

**Agricultural sciences**

z. Agriculture, forestry and fisheries sciences .....	\$	<input type="text"/>	,000
aa. Animal and dairy sciences .....	\$	<input type="text"/>	,000
ab. Veterinary sciences .....	\$	<input type="text"/>	,000
ac. Agricultural biotechnology .....	\$	<input type="text"/>	,000
ad. Other agricultural sciences .....	\$	<input type="text"/>	,000
<b>Total agricultural sciences</b>	\$	<input type="text"/>	,000

**Social sciences and humanities**

ae. Psychology .....	\$	<input type="text"/>	,000
af. Educational sciences .....	\$	<input type="text"/>	,000
ag. Economics and business .....	\$	<input type="text"/>	,000
ah. Other social sciences .....	\$	<input type="text"/>	,000
ai. Humanities .....	\$	<input type="text"/>	,000
<b>Total social sciences and humanities</b>	\$	<input type="text"/>	,000

**2021 - Total in-house R&D expenditures within Canada by field of research and development (should equal total in-house R&D expenditures from question 4) (sum of questions a. to ai.)**

\$	<input type="text"/>	,000
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## Nature of R&D for in-house R&D expenditures within Canada in 2021

11. In 2021, how were this business's **total expenditures** for R&D performed in-house within Canada distributed by nature of R&D?

**Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.

**Applied research** is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective.

**Experimental development** is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.

(OECD. Frascati Manual: Proposed Standard for Surveys on Research and Experimental Development, 2015)

### Percentage of total in-house R&D expenditures

a. Basic research .....	E45091_y1	<input type="text"/>	<input type="text"/>	<input type="text"/>	%
b. Applied research .....	E45091_y2	<input type="text"/>	<input type="text"/>	<input type="text"/>	%
c. Experimental development .....	E45091_y3	<input type="text"/>	<input type="text"/>	<input type="text"/>	%
<b>Total percentage</b>	E45140	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	%

## Results of R&D expenditures from 2019 to 2021

12. During the three (3) years 2019, 2020 and 2021, did this business's **total expenditures** for R&D performed in-house and outsourced (contracted out or granted) within Canada or outside Canada lead to new or significant improvements in the following?

		Yes	No
a. Goods	B10033	1	2
<b>Include</b> goods developed through new knowledge from research discoveries. ....		<input type="radio"/>	<input type="radio"/>
b. Services	B10034	1	2
<b>Include</b> on-going knowledge transfer to physicians, first responders, patients and the general public. ....		<input type="radio"/>	<input type="radio"/>
c. Methods of manufacturing or producing goods and services .....	B10035	1	2
d. Logistics, delivery or distribution methods for this business's inputs, goods or services. ....	B10036	1	2
e. Supporting activities for this business's processes, such as maintenance systems or operations for purchasing, accounting or computing. ....	B10037	1	2

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## In-house R&D personnel in 2021

13. In 2021, how many in-house R&D personnel within Canada did this business have in the following R&D occupations?

Please report in full-time equivalents (FTE).

Include on-site consultants and contractors in line e.

If this business is unable to provide a gender breakdown of FTEs, please leave the associated fields empty and report only the totals.

### 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 personnel, it is necessary to estimate the full-time equivalent of these persons working only part-time in R&D.

Full-time equivalent (FTE) = Number of persons who work solely on R&D projects + the time of persons working only part of their time on R&D.

Example calculation: If out of four scientists engaged in R&D work, one works solely on R&D projects and the remaining three devote only one quarter of their working time to R&D, then:  $FTE = 1 + 1/4 + 1/4 + 1/4 = 1.75$  scientists.

### Researchers and research managers

	Male (FTEs)	Female (FTEs)	Another gender (FTEs)	Total (FTEs)
a. Scientists, social scientists, engineers and researchers Include software developers and programmers. ....	B20045_o1_y1	B20045_o2_y1	B20045_o3_y1	B20045_y1
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	B20045_o1_y2	B20045_o2_y2	B20045_o3_y2	B20045_y2
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
b. Senior research managers .....				
	B20045_o1_y3	B20045_o2_y3	B20045_o3_y3	B20045_y3
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Total researchers and research managers</b>				

### R&D technical, administrative and support staff

c. Technicians, technologists and research assistants Include software technicians. ....	B20045_o1_y4	B20045_o2_y4	B20045_o3_y4	B20045_y4
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	B20045_o1_y5	B20045_o2_y5	B20045_o3_y5	B20045_y5
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
d. Other R&D technical, administrative and support staff .....				
	B20045_o1_y6	B20045_o2_y6	B20045_o3_y6	B20045_y6
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Total R&amp;D technical, administrative and support staff</b>				

### Other R&D occupations

e. On-site R&D consultants and contractors .....	B20045_o1_y7	B20045_o2_y7	B20045_o3_y7	B20045_y7
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Total in-house R&amp;D personnel within Canada (sum of questions a. to e.)</b>	B20040_o1	B20040_o2	B20040_o3	B20040
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

### Percentage of software-related activities

B20046

14. Of this business's total in-house R&D personnel reported above, what percentage performed software-related activities? .....

%



15. In 2021, how were the total in-house R&D personnel distributed by province or territory?

Please report in full-time equivalents (FTE).

	Number of researchers and research managers	Number of R&D technical, administrative and support staff	Number of on-site R&D consultants and contractors
a. Newfoundland and Labrador	B20047_g1	B20048_g1	B20049_g1
b. Prince Edward Island	B20047_g2	B20048_g2	B20049_g2
c. Nova Scotia	B20047_g3	B20048_g3	B20049_g3
d. New Brunswick	B20047_g4	B20048_g4	B20049_g4
e. Quebec	B20047_g5	B20048_g5	B20049_g5
f. Ontario	B20047_g6	B20048_g6	B20049_g6
g. Manitoba	B20047_g7	B20048_g7	B20049_g7
h. Saskatchewan	B20047_g8	B20048_g8	B20049_g8
i. Alberta	B20047_g9	B20048_g9	B20049_g9
j. British Columbia	B20047_g10	B20048_g10	B20049_g10
k. Yukon	B20047_g11	B20048_g11	B20049_g11
l. Northwest Territories	B20047_g12	B20048_g12	B20049_g12
m. Nunavut	B20047_g13	B20048_g13	B20049_g13
<b>Total in-house R&amp;D personnel within Canada</b>	B20050	B20060	B20070
	▲ Should equal total researchers and research managers from question 13	▲ Should equal total R&D technical, administrative and support staff from question 13	▲ Should equal total on-site consultants and contractors from question 13

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**Technology and technical assistance payments in 2021**

16. In 2021, how much did this business pay to other organizations for technology and technical assistance?  
 Please report all amounts in thousands of Canadian dollars.  
 Report '1' for payments made between \$1 and \$999.

**Payments made to parent, affiliated or subsidiary companies**

**Payments made within Canada**  
CAN\$ '000

**Payments made outside Canada**  
CAN\$ '000

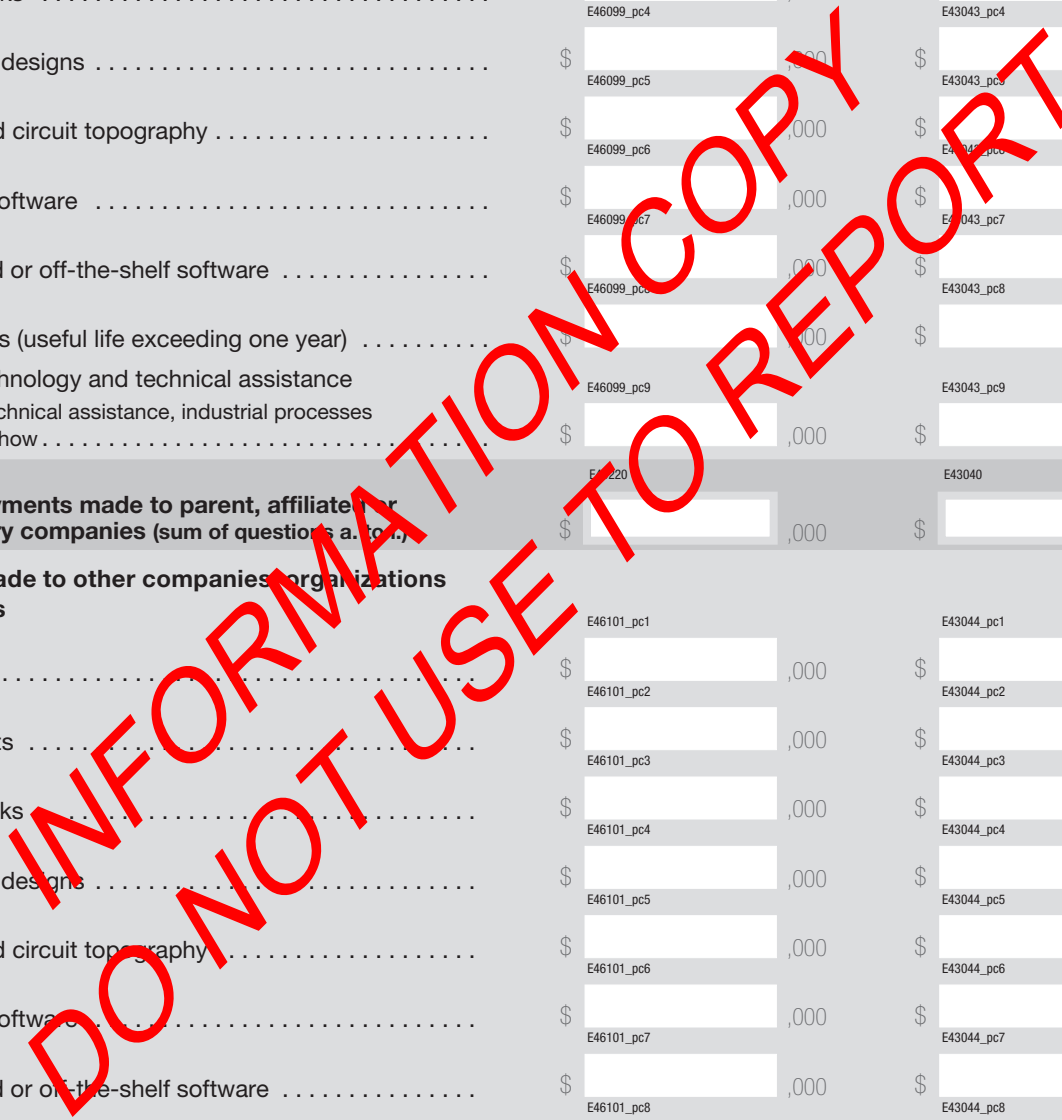
	E46099_pc1	E46099_pc2	E46099_pc3	E46099_pc4	E46099_pc5	E46099_pc6	E46099_pc7	E46099_pc8	E46099_pc9	E46220	E43043_pc1	E43043_pc2	E43043_pc3	E43043_pc4	E43043_pc5	E43043_pc6	E43043_pc7	E43043_pc8	E43043_pc9	E43040	
a. Patents	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	
b. Copyrights																					
c. Trademarks																					
d. Industrial designs																					
e. Integrated circuit topography																					
f. Original software																					
g. Packaged or off-the-shelf software																					
h. Databases (useful life exceeding one year)																					
i. Other technology and technical assistance Include technical assistance, industrial processes and know-how																					
<b>Total payments made to parent, affiliated or subsidiary companies (sum of questions a. to i.)</b>																					

**Payments made to other companies, organizations or individuals**

	E46101_pc1	E46101_pc2	E46101_pc3	E46101_pc4	E46101_pc5	E46101_pc6	E46101_pc7	E46101_pc8	E46101_pc9	E46230	E43044_pc1	E43044_pc2	E43044_pc3	E43044_pc4	E43044_pc5	E43044_pc6	E43044_pc7	E43044_pc8	E43044_pc9	E43050	
j. Patents	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	
k. Copyrights																					
l. Trademarks																					
m. Industrial designs																					
n. Integrated circuit topography																					
o. Original software																					
p. Packaged or off-the-shelf software																					
q. Databases (useful life exceeding one year)																					
r. Other technology and technical assistance Include technical assistance, industrial processes and know-how																					
<b>Total payments made to other companies, organizations or individuals (sum of questions j. to r.)</b>																					

**Total payments made to other organizations for technology and technical assistance (sum of questions a. to r.)**

E46260	E43060
\$	\$



17. In 2021, how much did this business receive from other organizations for technology and technical assistance?

Please report all amounts in thousands of Canadian dollars.  
Report '1' for payments received between \$1 and \$999.

	Payments received from within Canada	Payments received from outside Canada
	CAN\$ '000	CAN\$ '000
<b>Payments received from parent, affiliated or subsidiary companies</b>		
a. Patents	E46102_pc1 \$ <input type="text"/> ,000	E63042_pc1 \$ <input type="text"/> ,000
b. Copyrights	E46102_pc2 \$ <input type="text"/> ,000	E63042_pc2 \$ <input type="text"/> ,000
c. Trademarks	E46102_pc3 \$ <input type="text"/> ,000	E63042_pc3 \$ <input type="text"/> ,000
d. Industrial designs	E46102_pc4 \$ <input type="text"/> ,000	E63042_pc4 \$ <input type="text"/> ,000
e. Integrated circuit topography	E46102_pc5 \$ <input type="text"/> ,000	E63042_pc5 \$ <input type="text"/> ,000
f. Original software	E46102_pc6 \$ <input type="text"/> ,000	E63042_pc6 \$ <input type="text"/> ,000
g. Packaged or off-the-shelf software	E46102_pc7 \$ <input type="text"/> ,000	E63042_pc7 \$ <input type="text"/> ,000
h. Databases (useful life exceeding one year)	E46102_pc8 \$ <input type="text"/> ,000	E63042_pc8 \$ <input type="text"/> ,000
i. Other technology and technical assistance Include technical assistance, industrial processes and know-how	E46102_pc9 \$ <input type="text"/> ,000	E63042_pc9 \$ <input type="text"/> ,000
<b>Total payments received from parent, affiliated or subsidiary companies (sum of questions a. to i.)</b>	E46240 \$ <input type="text"/> ,000	E63030 \$ <input type="text"/> ,000
<b>Payments received from other companies, organizations or individuals</b>		
j. Patents	E46103_pc1 \$ <input type="text"/> ,000	E63043_pc1 \$ <input type="text"/> ,000
k. Copyrights	E46103_pc2 \$ <input type="text"/> ,000	E63043_pc2 \$ <input type="text"/> ,000
l. Trademarks	E46103_pc3 \$ <input type="text"/> ,000	E63043_pc3 \$ <input type="text"/> ,000
m. Industrial designs	E46103_pc4 \$ <input type="text"/> ,000	E63043_pc4 \$ <input type="text"/> ,000
n. Integrated circuit topography	E46103_pc5 \$ <input type="text"/> ,000	E63043_pc5 \$ <input type="text"/> ,000
o. Original software	E46103_pc6 \$ <input type="text"/> ,000	E63043_pc6 \$ <input type="text"/> ,000
p. Packaged or off-the-shelf software	E46103_pc7 \$ <input type="text"/> ,000	E63043_pc7 \$ <input type="text"/> ,000
q. Databases (useful life exceeding one year)	E46103_pc8 \$ <input type="text"/> ,000	E63043_pc8 \$ <input type="text"/> ,000
r. Other technology and technical assistance Include technical assistance, industrial processes and know-how	E46103_pc9 \$ <input type="text"/> ,000	E63043_pc9 \$ <input type="text"/> ,000
<b>Total payments received from other companies, organizations or individuals (sum of questions j. to r.)</b>	E46250 \$ <input type="text"/> ,000	E63040 \$ <input type="text"/> ,000
<b>Total payments received from other organizations for technology and technical assistance (sum of questions a. to r.)</b>	E46270 \$ <input type="text"/> ,000	E63050 \$ <input type="text"/> ,000

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**ENERGY-RELATED R&D BY AREA OF TECHNOLOGY**

18. In 2021, did this business's **total in-house and outsourced** (contracted out or granted) **R&D expenditures include energy-related R&D** in the following categories?

- |                               |                                      |
|-------------------------------|--------------------------------------|
| 1. Fossil fuels               | 5. Hydrogen and fuel cells           |
| 2. Renewable energy resources | 6. Energy efficiency                 |
| 3. Nuclear fission and fusion | 7. Other energy-related technologies |
| 4. Electric power             |                                      |

- Yes** → Please provide details below
- No** → Go to question 19

**2021 in-house energy-related R&D expenditures**

Energy-related **R&D** by area of technology (consult the reporting guide at [www.statcan.gc.ca/guides-e](http://www.statcan.gc.ca/guides-e) for further information and definitions)

A	B	C
Funds from this business	Funds from federal, provincial or territorial government(s)	All other Canadian sources of funds
CAN\$ '000		

**1. Fossil fuels**

a) Crude oils and natural gas exploration	E64052_e1_y1 \$ ,000	E64053_e1_y1 \$ ,000	E64054_e1_y1 \$ ,000
b) Crude oils and natural gas production and storage <b>Include</b> enhanced recovery natural gas production.	E64052_e1_y2 \$ ,000	E64053_e1_y2 \$ ,000	E64054_e1_y2 \$ ,000
c) Oil sands and heavy crude oil surface and sub-surface production and separation of bitumen, tailings management	E64052_e1_y3 \$ ,000	E64053_e1_y3 \$ ,000	E64054_e1_y3 \$ ,000
d) Refining, processing and upgrading of fossil fuels	E64052_e1_y4 \$ ,000	E64053_e1_y4 \$ ,000	E64054_e1_y4 \$ ,000
e) Coal production, separation and processing	E64052_e1_y5 \$ ,000	E64053_e1_y5 \$ ,000	E64054_e1_y5 \$ ,000
f) Transportation of fossil fuels	E64052_e1_y6 \$ ,000	E64053_e1_y6 \$ ,000	E64054_e1_y6 \$ ,000

**2. Renewable energy resources**

a) Solar photovoltaics (PV)	E64052_e2_y1 \$ ,000	E64053_e2_y1 \$ ,000	E64054_e2_y1 \$ ,000
b) Solar thermal-power and high-temperature applications	E64052_e2_y2 \$ ,000	E64053_e2_y2 \$ ,000	E64054_e2_y2 \$ ,000
c) Solar heating and cooling	E64052_e2_y3 \$ ,000	E64053_e2_y3 \$ ,000	E64054_e2_y3 \$ ,000
d) Wind energy	E64052_e2_y4 \$ ,000	E64053_e2_y4 \$ ,000	E64054_e2_y4 \$ ,000
e) Bio-energy – biomass production and transportation	E64052_e2_y5 \$ ,000	E64053_e2_y5 \$ ,000	E64054_e2_y5 \$ ,000
f) Bio-energy – biomass conversion to transportation fuel	E64052_e2_y6 \$ ,000	E64053_e2_y6 \$ ,000	E64054_e2_y6 \$ ,000
g) Bio-energy – biomass conversion to heat and electricity	E64052_e2_y7 \$ ,000	E64053_e2_y7 \$ ,000	E64054_e2_y7 \$ ,000
h) Other bio-energy	E64052_e2_y8 \$ ,000	E64053_e2_y8 \$ ,000	E64054_e2_y8 \$ ,000
i) Small hydro (less than 10 MW)	E64052_e2_y9 \$ ,000	E64053_e2_y9 \$ ,000	E64054_e2_y9 \$ ,000
j) Large hydro (greater than or equal to 10 MW)	E64052_e2_y10 \$ ,000	E64053_e2_y10 \$ ,000	E64054_e2_y10 \$ ,000
k) Other renewable energy <b>Include</b> ocean and geothermal.	E64052_e2_y11 \$ ,000	E64053_e2_y11 \$ ,000	E64054_e2_y11 \$ ,000

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2021 in-house energy-related R&D expenditures		2021 outsourced (contracted out or granted) energy-related R&D expenditures		
D All foreign sources of funds	Total in-house R&D (= A+B+C+D)	E Outsourced (contracted out or granted) within Canada	F Outsourced (contracted out or granted) outside Canada	Total outsourced R&D (= E+F)
CAN\$ '000		CAN\$ '000		
<b>1. Fossil fuels</b>				
E63045_e1_y1	E45097_e1_y1	E46104_e1_y1	E43045_e1_y1	E40430_e1_y1
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e1_y2	E45097_e1_y2	E46104_e1_y2	E43045_e1_y2	E40430_e1_y2
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e1_y3	E45097_e1_y3	E46104_e1_y3	E43045_e1_y3	E40430_e1_y3
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e1_y4	E45097_e1_y4	E46104_e1_y4	E43045_e1_y4	E40430_e1_y4
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e1_y5	E45097_e1_y5	E46104_e1_y5	E43045_e1_y5	E40430_e1_y5
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e1_y6	E45097_e1_y6	E46104_e1_y6	E43045_e1_y6	E40430_e1_y6
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
<b>2. Renewable energy resource</b>				
E63045_e2_y1	E45097_e2_y1	E46104_e2_y1	E43045_e2_y1	E40430_e2_y1
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e2_y2	E45097_e2_y2	E46104_e2_y2	E43045_e2_y2	E40430_e2_y2
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e2_y3	E45097_e2_y3	E46104_e2_y3	E43045_e2_y3	E40430_e2_y3
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e2_y4	E45097_e2_y4	E46104_e2_y4	E43045_e2_y4	E40430_e2_y4
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e2_y5	E45097_e2_y5	E46104_e2_y5	E43045_e2_y5	E40430_e2_y5
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e2_y6	E45097_e2_y6	E46104_e2_y6	E43045_e2_y6	E40430_e2_y6
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e2_y7	E45097_e2_y7	E46104_e2_y7	E43045_e2_y7	E40430_e2_y7
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e2_y8	E45097_e2_y8	E46104_e2_y8	E43045_e2_y8	E40430_e2_y8
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e2_y9	E45097_e2_y9	E46104_e2_y9	E43045_e2_y9	E40430_e2_y9
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e2_y10	E45097_e2_y10	E46104_e2_y10	E43045_e2_y10	E40430_e2_y10
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000
E63045_e2_y11	E45097_e2_y11	E46104_e2_y11	E43045_e2_y11	E40430_e2_y11
\$ ,000	\$ ,000	\$ ,000	\$ ,000	\$ ,000

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2021 in-house energy-related R&D expenditures

Energy-related R&D by area of technology  
(consult the reporting guide at  
www.statcan.gc.ca/guides-e  
for further information and definitions)

A  
Funds from this business

B  
Funds from federal,  
provincial or territorial  
government(s)

C  
All other Canadian  
sources of funds

CAN\$ '000

3. Nuclear fission and fusion

a) Nuclear materials exploration, mining and preparation, tailings management	E64052_e3_y1 \$ ,000	E64053_e3_y1 \$ ,000	E64054_e3_y1 \$ ,000
b) Nuclear reactors	E64052_e3_y2 \$ ,000	E64053_e3_y2 \$ ,000	E64054_e3_y2 \$ ,000
c) Other fission	E64052_e3_y3 \$ ,000	E64053_e3_y3 \$ ,000	E64054_e3_y3 \$ ,000
d) Fusion	E64052_e3_y4 \$ ,000	E64053_e3_y4 \$ ,000	E64054_e3_y4 \$ ,000

4. Electric power

a) Electric power generation in utility sector	E64052_e4_y1 \$ ,000	E64053_e4_y1 \$ ,000	E64054_e4_y1 \$ ,000
b) Electric power - combined heat and power in industry, buildings	E64052_e4_y2 \$ ,000	E64053_e4_y2 \$ ,000	E64054_e4_y2 \$ ,000
c) Electricity transmission, distribution and storage	E64052_e4_y3 \$ ,000	E64053_e4_y3 \$ ,000	E64054_e4_y3 \$ ,000

5. Hydrogen and fuel cells

a) Hydrogen production for process applications	E64052_e5_y1 \$ ,000	E64053_e5_y1 \$ ,000	E64054_e5_y1 \$ ,000
b) Hydrogen production for transportation applications	E64052_e5_y2 \$ ,000	E64053_e5_y2 \$ ,000	E64054_e5_y2 \$ ,000
c) Hydrogen transport and storage	E64052_e5_y3 \$ ,000	E64053_e5_y3 \$ ,000	E64054_e5_y3 \$ ,000
d) Other hydrogen	E64052_e5_y4 \$ ,000	E64053_e5_y4 \$ ,000	E64054_e5_y4 \$ ,000
e) Stationary fuel cells	E64052_e5_y5 \$ ,000	E64053_e5_y5 \$ ,000	E64054_e5_y5 \$ ,000
f) Mobile fuel cells	E64052_e5_y6 \$ ,000	E64053_e5_y6 \$ ,000	E64054_e5_y6 \$ ,000

6. Energy efficiency

a) Energy efficiency applications for industry	E64052_e6_y1 \$ ,000	E64053_e6_y1 \$ ,000	E64054_e6_y1 \$ ,000
b) Energy efficiency for residential, institutional and commercial sectors	E64052_e6_y2 \$ ,000	E64053_e6_y2 \$ ,000	E64054_e6_y2 \$ ,000
c) Energy efficiency for transportation	E64052_e6_y3 \$ ,000	E64053_e6_y3 \$ ,000	E64054_e6_y3 \$ ,000
d) Other energy efficiency	E64052_e6_y4 \$ ,000	E64053_e6_y4 \$ ,000	E64054_e6_y4 \$ ,000

7. Other energy-related technologies

a) Carbon capture, transport and storage related to fossil fuel production and processing	E64052_e7_y1 \$ ,000	E64053_e7_y1 \$ ,000	E64054_e7_y1 \$ ,000
b) Carbon capture, transport and storage related to electric power production	E64052_e7_y2 \$ ,000	E64053_e7_y2 \$ ,000	E64054_e7_y2 \$ ,000
c) Carbon capture, transport and storage related to industry in end-use sector	E64052_e7_y3 \$ ,000	E64053_e7_y3 \$ ,000	E64054_e7_y3 \$ ,000
d) Energy system analysis	E64052_e7_y4 \$ ,000	E64053_e7_y4 \$ ,000	E64054_e7_y4 \$ ,000
e) All other energy-related technologies	E64052_e7_y5 \$ ,000	E64053_e7_y5 \$ ,000	E64054_e7_y5 \$ ,000

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2021 in-house energy-related R&D expenditures		2021 outsourced (contracted out or granted) energy-related R&D expenditures		
D All foreign sources of funds	Total in-house R&D (= A+B+C+D)	E Outsourced (contracted out or granted) within Canada	F Outsourced (contracted out or granted) outside Canada	Total outsourced R&D (= E+F)
CAN\$ '000		CAN\$ '000		
<b>3. Nuclear fission and fusion</b>				
E63045_e3_y1 \$ ,000	E45097_e3_y1 \$ ,000	E46104_e3_y1 \$ ,000	E43045_e3_y1 \$ ,000	E40430_e3_y1 \$ ,000
E63045_e3_y2 \$ ,000	E45097_e3_y2 \$ ,000	E46104_e3_y2 \$ ,000	E43045_e3_y2 \$ ,000	E40430_e3_y2 \$ ,000
E63045_e3_y3 \$ ,000	E45097_e3_y3 \$ ,000	E46104_e3_y3 \$ ,000	E43045_e3_y3 \$ ,000	E40430_e3_y3 \$ ,000
E63045_e3_y4 \$ ,000	E45097_e3_y4 \$ ,000	E46104_e3_y4 \$ ,000	E43045_e3_y4 \$ ,000	E40430_e3_y4 \$ ,000
<b>4. Electric power</b>				
E63045_e4_y1 \$ ,000	E45097_e4_y1 \$ ,000	E46104_e4_y1 \$ ,000	E43045_e4_y1 \$ ,000	E40430_e4_y1 \$ ,000
E63045_e4_y2 \$ ,000	E45097_e4_y2 \$ ,000	E46104_e4_y2 \$ ,000	E43045_e4_y2 \$ ,000	E40430_e4_y2 \$ ,000
E63045_e4_y3 \$ ,000	E45097_e4_y3 \$ ,000	E46104_e4_y3 \$ ,000	E43045_e4_y3 \$ ,000	E40430_e4_y3 \$ ,000
<b>5. Hydrogen and fuel cells</b>				
E63045_e5_y1 \$ ,000	E45097_e5_y1 \$ ,000	E46104_e5_y1 \$ ,000	E43045_e5_y1 \$ ,000	E40430_e5_y1 \$ ,000
E63045_e5_y2 \$ ,000	E45097_e5_y2 \$ ,000	E46104_e5_y2 \$ ,000	E43045_e5_y2 \$ ,000	E40430_e5_y2 \$ ,000
E63045_e5_y3 \$ ,000	E45097_e5_y3 \$ ,000	E46104_e5_y3 \$ ,000	E43045_e5_y3 \$ ,000	E40430_e5_y3 \$ ,000
E63045_e5_y4 \$ ,000	E45097_e5_y4 \$ ,000	E46104_e5_y4 \$ ,000	E43045_e5_y4 \$ ,000	E40430_e5_y4 \$ ,000
E63045_e5_y5 \$ ,000	E45097_e5_y5 \$ ,000	E46104_e5_y5 \$ ,000	E43045_e5_y5 \$ ,000	E40430_e5_y5 \$ ,000
E63045_e5_y6 \$ ,000	E45097_e5_y6 \$ ,000	E46104_e5_y6 \$ ,000	E43045_e5_y6 \$ ,000	E40430_e5_y6 \$ ,000
<b>6. Energy efficiency</b>				
E63045_e6_y1 \$ ,000	E45097_e6_y1 \$ ,000	E46104_e6_y1 \$ ,000	E43045_e6_y1 \$ ,000	E40430_e6_y1 \$ ,000
E63045_e6_y2 \$ ,000	E45097_e6_y2 \$ ,000	E46104_e6_y2 \$ ,000	E43045_e6_y2 \$ ,000	E40430_e6_y2 \$ ,000
E63045_e6_y3 \$ ,000	E45097_e6_y3 \$ ,000	E46104_e6_y3 \$ ,000	E43045_e6_y3 \$ ,000	E40430_e6_y3 \$ ,000
E63045_e6_y4 \$ ,000	E45097_e6_y4 \$ ,000	E46104_e6_y4 \$ ,000	E43045_e6_y4 \$ ,000	E40430_e6_y4 \$ ,000
<b>7. Other energy-related technologies</b>				
E63045_e7_y1 \$ ,000	E45097_e7_y1 \$ ,000	E46104_e7_y1 \$ ,000	E43045_e7_y1 \$ ,000	E40430_e7_y1 \$ ,000
E63045_e7_y2 \$ ,000	E45097_e7_y2 \$ ,000	E46104_e7_y2 \$ ,000	E43045_e7_y2 \$ ,000	E40430_e7_y2 \$ ,000
E63045_e7_y3 \$ ,000	E45097_e7_y3 \$ ,000	E46104_e7_y3 \$ ,000	E43045_e7_y3 \$ ,000	E40430_e7_y3 \$ ,000
E63045_e7_y4 \$ ,000	E45097_e7_y4 \$ ,000	E46104_e7_y4 \$ ,000	E43045_e7_y4 \$ ,000	E40430_e7_y4 \$ ,000
E63045_e7_y5 \$ ,000	E45097_e7_y5 \$ ,000	E46104_e7_y5 \$ ,000	E43045_e7_y5 \$ ,000	E40430_e7_y5 \$ ,000

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## Environmental and clean technology R&D expenditures in 2021

19. In 2021, what percentage of this business's **total expenditures** for **R&D performed in-house** within Canada was related to **research and development of environmental and clean technologies**?

**Environmental and clean technology product** is defined as any process, product, or service that reduces environmental impacts: through environmental protection activities that prevent, reduce or eliminate pollution or any other degradation of the environment, resource management activities that result in the more efficient use of natural resources, thus safeguarding against their depletion; or the use of goods that have been adapted to be significantly less energy or resource intensive than the industry standard.

**Report '0' for no environmental and clean technology R&D expenditures.**

If precise figures are not available, please provide your best estimate.

Percentage of  
environmental and  
clean technology  
R&D

E45238

%

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20. In 2021, in which of the following categories of **environmental and clean technology** did this business perform **R&D** activities?

Mark all that apply.

B05203\_y11

Air pollution management

**e.g.**, greenhouse gas control technologies or management services, physical or chemical treatment technologies, air pollution modeling and mapping services

B05203\_y9

Solid waste management

**e.g.**, collection of waste, recycling and organics, compaction-related technologies, landfill leachate collection and containment technologies

B05203\_y10

Wastewater management

**e.g.**, physical or chemical treatments of industrial wastewater, mine tailing handling and treatment, biological treatments of sewage

B05203\_y12

Protection and remediation of soil, groundwater and surface water

**e.g.**, in situ and ex situ biological, physical, chemical, thermal treatments, containment

B05203\_y13

Protection of biodiversity and habitat

B05203\_y14

Noise and vibration abatement

**Exclude R&D** related to workers' health and safety.

B05203\_y15

Protection against radiation

**Exclude R&D** related to workers' health and safety.

B05203\_y16

Heat and energy savings and management

**e.g.**, efficient equipment (advance insulation, high efficiency pumps or burner (Energy Star)), energy storage technologies (flywheels, fuel cells), lighting upgrades, smart grid services and associated technologies

B05203\_y17

Fuel efficient vehicles and transportation goods or technologies

**e.g.**, electric and hybrid vehicles, vehicles using alternative fuels, alternative fuel retrofits on existing vehicles, low-rolling resistance tires

B05203\_y18

Production of energy from renewable sources

**e.g.**, equipment, services, and technologies used to produce electricity or heat from renewable sources

B05203\_y20

Production of nuclear energy

**e.g.**, equipment, services, and technologies used to produce electricity or heat from nuclear energy

**Exclude the R&D** on feedstock used to produce energy such as uranium

B05203\_y90

Other environmental protection or resource management activities

Specify the other environmental protection or resource management activities

B05203\_y91

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## Changes or events

21. Indicate any changes or events that affected the reported values for this business or organization compared with the last reporting period.

Mark all that apply.

B00316\_r1

Outsourcing of **R&D** project(s)

B00316\_r2

Initiation of new **R&D** project(s)

B00316\_r3

Completion of existing **R&D** project(s)

B00316\_r4

Major change in funding of **R&D** project(s) (loss of funding)

B00316\_r5

Major change in funding of **R&D** project(s) (increase in funding)

B00316\_r6

Organizational change that affected **R&D** activities (expansion, reduction, restructuring)

B00316\_r7

Economic change that affected **R&D** activities

B00316\_r11

Lack of availability of qualified **R&D** personnel

B00302\_t15

Other changes or events — specify:

B00302\_t16

**OR**

B00316\_t17

No changes or events

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## General information

### Confidentiality

#### Your answers are confidential.

By law, Statistics Canada is prohibited from releasing any information it collects that could identify any person, business, or organization, unless consent has been given by the respondent, or as permitted by the *Statistics Act*. Statistics Canada will use the information from this survey for statistical purposes only.

### Data-sharing agreements

To reduce respondent burden, Statistics Canada has entered into data-sharing agreements with provincial and territorial statistical agencies and other government organizations, which have agreed to keep the data confidential and use them only for statistical purposes. Statistics Canada will only share data from this survey with those organizations that have demonstrated a requirement to use the data.

### Provincial and territorial statistical agencies

**Section 11** of the *Statistics Act* provides for the sharing of information with provincial and territorial statistical agencies that meet certain conditions. These agencies must have the legislative authority to collect the same information, on a mandatory basis, and the legislation must provide substantially the same provisions for confidentiality and penalties for disclosure of confidential information as the *Statistics Act*. Because these agencies have the legal authority to compel businesses to provide the same information, consent is not requested and businesses may not object to the sharing of the data.

For this survey, there are **Section 11** agreements with the provincial and territorial statistical agencies of Newfoundland and Labrador, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and the Yukon. The shared data will be limited to information on in-house research and development expenditures (Question 8) and in-house research and development personnel (Question 15) pertaining to business establishments located within the jurisdiction of the respective province or territory.

**Section 12** of the *Statistics Act* provides for the sharing of information with federal, provincial or territorial government organizations. Under **Section 12**, you

may refuse to share your information with any of these organizations by writing a letter of objection to the Chief Statistician and returning it with the completed questionnaire. Please specify the organizations with which you do not want to share your data.

For this survey, there are **Section 12** agreements with the statistical agencies of Prince Edward Island, the Northwest Territories and Nunavut. The shared data will be limited to information on in-house research and development expenditures (Question 8) and in-house research and development personnel (Question 15) pertaining to business establishments located within the jurisdiction of the respective province or territory.

### Innovation, Science and Economic Development Canada

For this survey, Statistics Canada will share survey data with Innovation, Science and Economic Development Canada. The shared data will be limited to information on research and development expenditures (Questions 4 to 12) and in-house research and development personnel (Questions 13 to 15).

### Natural Resources Canada

For respondents with expenditures on energy-related research and development in technology (fossil fuels, renewable energy resources, nuclear fission and fusion, electric power, hydrogen and fuel cells, energy efficiency, other energy-related technologies), Statistics Canada will also share survey data with the Office of Energy Research and Development (OERD) of Natural Resources Canada. The shared data will be limited to information on Energy Research and Development Expenditures by Area of Technology (Question 18).

You may refuse to share your information with this organization by writing a letter of objection to the Chief Statistician and returning it with the completed questionnaire.

### Record linkages

To enhance the data from this survey and to reduce the reporting burden, Statistics Canada may combine the acquired data with information from other surveys or from administrative sources.

**Thank you for completing this questionnaire.**

**Please retain a copy for your records.**

**Visit our website, [www.statcan.gc.ca](http://www.statcan.gc.ca)**