

Research and development on energy efficiency technologies more than doubled in 2018

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Energy-related areas of technology include fossil fuels, renewable energy sources, nuclear fission and fusion, electric power, hydrogen and fuel cells, energy efficiency, and other energy-related technologies.

Fossil fuel technologies continued to account for the largest area of energy-related in-house research and development (R&D) spending in 2018, at almost two-fifths (\$665 million) of the total. However, this area's dominance has fallen from 2014, when it accounted for almost two-thirds of all energy-related in-house R&D expenditures. The change reflects contractions in the oil and gas extraction sector arising from price shocks during the period.

In-house R&D spending on electric power and energy efficiency technologies rises

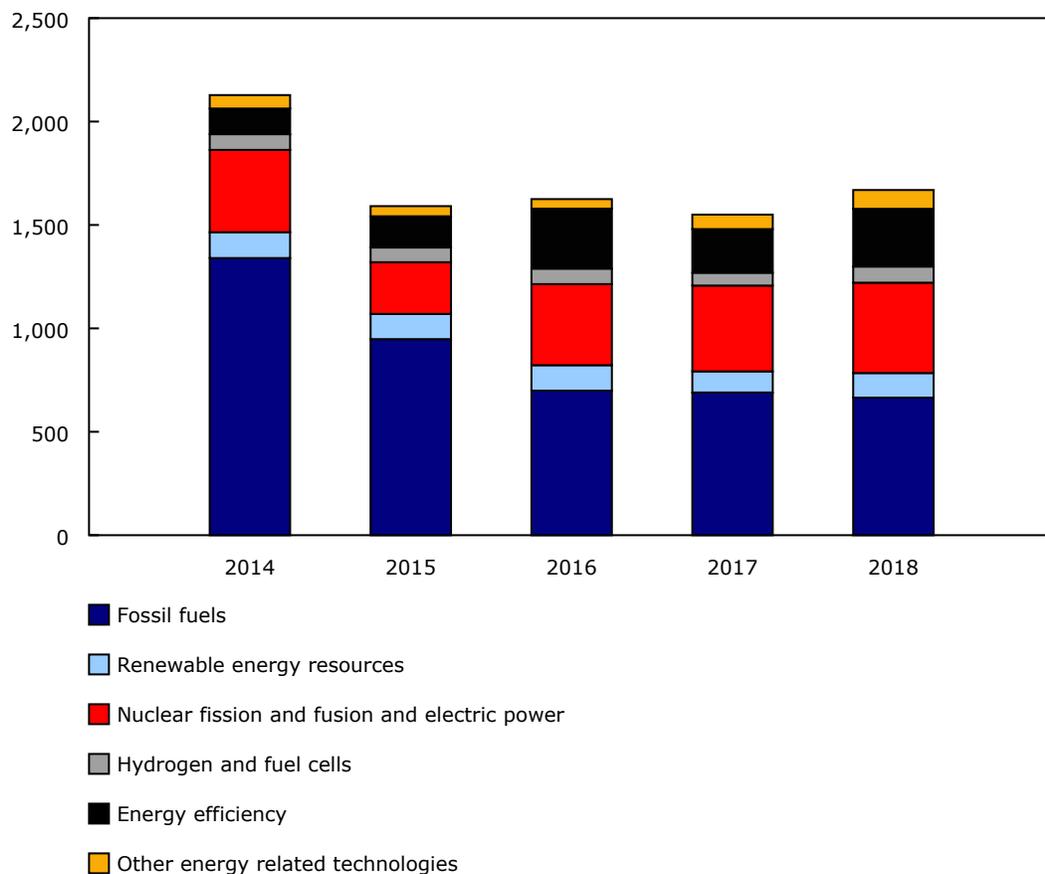
While R&D on fossil fuels declined from 2014 to 2018, in-house R&D on electric power and energy efficiency technologies both more than doubled. R&D spending related to electric power technologies increased from \$79 million to \$168 million over the five-year period, while spending on energy efficiency increased from \$124 million to \$279 million, making it the second largest area of R&D on energy-related technologies in 2018.

In-house spending also rose on other energy-related R&D (up 40% to \$91 million) from 2014 to 2018. Not all non-fossil fuel technologies reported increases, as spending on renewable energy and nuclear fission and fusion edged down.



Chart 1
Energy-related in-house research and development (R&D) expenditures by area of technology, 2014 to 2018

R&D spending (millions of dollars)



Source(s): Table 27-10-0347-01.

Not surprising given the importance of R&D related to fossil fuel technologies, the oil and gas extraction industry reported the highest in-house energy-related R&D spending by industry (\$486 million), all of which was spent on fossil fuels technologies.

R&D by electric power generation companies (\$314 million) followed and was focussed primarily on nuclear fission and fusion (\$194 million) and electric power (\$93 million).

Service industries as a whole accounted for \$453 million of energy-related R&D, led by research and development in physical, engineering and life sciences (\$145 million) and architectural, engineering and related services (\$131 million). In-house spending by businesses in service industries was distributed across every type of energy-related R&D, with energy efficiency accounting for the largest share (\$134 million).

Outsourced energy-related R&D is concentrated on fossil fuels technologies

In addition to performing energy-related R&D, businesses also outsourced R&D. Outsourced R&D was concentrated on fossil fuels technologies, which accounted for \$136 million out of the total outsourced energy R&D (\$205 million) in 2018.

Sustainable Development Goals

On January 1, 2016, the world officially began implementation of the [2030 Agenda for Sustainable Development](#)—the United Nations' transformative plan of action that addresses urgent global challenges over the next 15 years. The plan is based on 17 specific sustainable development goals.

Data on energy-related research and development expenditures by area of technology are an example of how Statistics Canada supports the reporting on the Global Goals for Sustainable Development. This release will be used in helping to measure the following goal:



Note to readers

Energy-related technologies

Energy-related technologies include fossil fuels, renewable energy sources, nuclear fission and fusion, electric power, hydrogen and fuel cells, energy efficiency and other energy-related technologies.

Data collection

The Energy Research and Development Expenditures by Area of Technology survey data are collected as part of the Annual Survey of Research and Development in Canadian Industry.

Random Tabular Adjustment

The Annual Survey of Research and Development in Canadian Industry and the associated Energy Research and Development Expenditures by Area of Technology survey, 2018, are the first annual surveys at Statistics Canada to use the Random Tabular Adjustment (RTA) technique, which aims to increase the amount of data made available to users, while protecting the confidentiality of respondents.

Statistics Canada typically uses suppression techniques to protect sensitive statistical information. These techniques involve suppressing data points that can directly or indirectly reveal information about a respondent. This can often lead to the suppression of a large number of data points and significantly reduce the amount of available data.

Using RTA, Statistics Canada can identify sensitive estimates and randomly adjust their value rather than suppress them. The size of the adjustment is calculated to protect respondent confidentiality. After adjusting the value, the agency assigns a quality measure (A, B, C, D, or E) to the estimate to indicate the degree of confidence that users can have in its accuracy. Quality measures account for uncertainty related to sampling, non-response and RTA, when applied.

For more information on RTA, please refer to the blog article, "[Random Tabular Adjustment is here!](#)," available as part of the StatCan Blog.

Available tables: table [27-10-0347-01](#).

Definitions, data sources and methods: survey number [4205](#).

The new interactive dashboard, "[Characteristics of research and development in Canadian industry](#)" ([71-607-X](#)), is now available.

For more information, or to enquire about the concepts, methods or data quality of this release, contact us (toll-free 1-800-263-1136; 514-283-8300; STATCAN.infostats-infostats.STATCAN@canada.ca) or Media Relations (613-951-4636; STATCAN.mediahotline-ligneinfomedias.STATCAN@canada.ca).