

Survey of Advanced Technology, 2014

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Adoption of advanced technology

More than 6 in 10 enterprises in industries covered by the 2014 Survey of Advanced Technology used at least one technology identified as 'advanced.'

The utilities sector had the highest rate of adoption of advanced technology, with three in four enterprises adopting at least one advanced technology.

Although slightly more than 60% of small enterprises (those with 10 to 99 employees) adopted at least one advanced technology, this share was over 90% for large enterprises (those with 250 and more employees).

Note to readers

The Survey of Advanced Technology is an occasional survey that collects essential information on the extent to which Canadian enterprises use advanced technologies. Just under 12,000 enterprises were selected from a survey population of 85,000 enterprises in 87 industry groupings. The sample was stratified by enterprise employment size.

An **advanced technology** is one that performs a new function or significantly improves an existing function performed by a more commonly used technology. For the purposes of this survey, 41 advanced technologies were selected and divided into four distinct technology groups:

1. *Advanced logistics (advanced material handling, supply chain and logistics),*
2. *Advanced business intelligence,*
3. *Advanced design and fabrication (advanced design, information control, processing and fabrication),*
4. *Advanced green technology.*

For more information, please see the Daily release entitled "[Survey of Advanced Technology: objectives and obstacles to the adoption of advanced technology in Canada](#)," released today.

The adoption of advanced technology is identified as one of the key components of innovation and technological development, leading to benefits including cost reduction, the expansion of product and service lines, and productivity gains.

While previous surveys on advanced technology adoption focused on the manufacturing sector alone, the 2014 Survey of Advanced Technology covered seven additional key sectors within the Canadian economy.



Table 1
Advanced technology adoption rates by surveyed industry, 2014

	% adoption rate ¹
All surveyed industries	63.1
Utilities	74.9
Manufacturing	69.9
Wholesale trade	66.2
Professional, scientific and technical services	65.9
Retail trade	59.5
Mining, quarrying, and oil and gas extraction	56.1
Transportation and warehousing	53.2
Forestry and logging	33.3

1. Industries using at least one advanced technology.
Source(s): Survey of Advanced Technology (4223).

Advanced logistics technologies are the most widely adopted

Among the four advanced technology groups, advanced logistics technologies were the most widely adopted, with more than 40% of all surveyed enterprises adopting at least one.

Table 2
Advanced technology adoption by technology group, all surveyed industries, 2014

	% adoption rate
Advanced logistics technologies	43.3
Advanced design and fabrication technologies	38.4
Advanced business intelligence technologies	29.2
Advanced green technologies	9.9

Source(s): CANSIM table 358-0455.

Advanced green technologies were adopted by the smallest share of enterprises covered by the survey, at just under 10%.

Overall, 37.9% of enterprises surveyed adopted a technology from at least two of the advanced technology groups.

Advanced logistics technologies

With the globalization of production and trade, Canadian enterprises now compete along the global supply chain. Therefore, adopting advanced logistic technologies may be understood as an element of innovation and economic growth.

This technology group includes material handling and supply chain-related advanced technologies that aim to facilitate the planning, implementation, and flow of goods and services from their point of origin to their final destination.

Enterprises in the wholesale trade sector (50.8%) reported the highest rate of adoption of advanced logistics technologies, followed closely by the utilities (50.7%) and retail trade (48.6%) sectors.

Automated products and parts identification technology, which includes bar and quick response (QR) coding, was the most widely used from this technology group, with more than one in five enterprises adopting this type of technology. Among sectors, retail trade (34.3%) most often adopted this technology.

Advanced business intelligence technologies

Advanced business intelligence technologies are used to collect, process, validate and analyze data to support decision making within enterprises. Such technologies include visually-based software designed to help managers make appropriate decisions based on complex data.

Enterprises in the utilities sector (50.9%) had the highest rate of adoption of advanced business intelligence technology, followed by the professional, scientific and technical services (39.6%) and wholesale trade (29.0%) sectors.

The most widely adopted advanced business intelligence technology was 'software as a service (SaaS),' reported by 15.0% of all surveyed enterprises. In general, SaaS consists of a separately located data centre that hosts an enterprise's software and associated data; examples include cloud-based storage, corporate email systems and customer relationship managers. Enterprises within the utilities sector (31.3%) had the highest SaaS adoption rate.

Advanced design and fabrication technologies

Advanced design and fabrication technologies comprise 24 advanced technologies that focus primarily on prototyping goods and improving production methods. Most of the technologies included in this group are commonly known as advanced manufacturing technologies.

Among sectors, manufacturing recorded the highest rate of adoption of advanced design and fabrication technologies, with nearly 6 in 10 manufacturing enterprises using at least one such technology. Manufacturing most commonly adopted virtual product development or modelling software (computer-aided design, computer-aided engineering, computer-aided manufacturing, etc.) from this technology group.

Table 3
Top 10 advanced design, information control, processing and fabrication technologies adopted by manufacturing enterprises, 2014

	% adoption rate
Virtual product development or modelling software	36.8
Intercompany computer networks, including Extranet and electronic data interchange	25.9
Enterprise resource planning	20.8
4 to 9 axis computer numerically controlled machinery	19.8
Wireless communications for production	17.5
Computer-integrated manufacturing	14.9
Manufacturing resource planning	13.3
Automated systems for inspection	10.9
Lasers used in materials processing	9.6
Software integration of quality results with planning and control software	9.2

Source(s): CANSIM table [358-0404](#).

Advanced green technologies

Advanced green technologies are processes, devices or applications designed to mitigate the effects of human activity on the environment and to promote the sustainability of ecosystems.

The utilities sector reported the highest overall rate of adoption of advanced green technologies, with a quarter of all enterprises within this sector reporting the adoption of at least one advanced green technology.

Mining, quarrying, and oil and gas extraction (16.1%), manufacturing (15.2%) and transportation and warehousing (14.8%) all reported similar advanced green technology adoption rates.

The most widely adopted advanced green technologies were processes, devices or applications related to the effective and efficient management of waste. Waste technologies include reduce, reuse, and recycle technologies, waste-to-energy technologies, waste-reduction technologies, hazardous-waste management and solid-waste management. In 2014, these types of advanced green technologies were adopted by 5.6% of all enterprises in Canada.

Large enterprises adopt more advanced technology

The use of multiple advanced technologies in Canada is highly concentrated among large enterprises. Specifically, 90.6% (**correction**) of large enterprises reported using three or more advanced technologies, a higher rate than that of medium-sized enterprises (76.4%) (**correction**) and small enterprises (56.4%) (**correction**).

The variety of advanced technologies adopted by large enterprises was more diversified among the four main advanced technology groups. For instance, 57.1% of large enterprises adopted an advanced technology from at least three different advanced technology groups, compared with 31.8% of medium-sized enterprises and 14.5% of small enterprises.

Investment in advanced technologies

Almost 30% of all enterprises invested in at least one advanced technology from 2012 to 2014. Overall, 17.6% of enterprises reported investing in an advanced logistics technology, the highest level of investment among the four main advanced technology groups. By contrast, 4% of enterprises reported investing in an advanced green technology.

Capital expenditures in advanced technology were financed most frequently by 'internal sources' (87.1%), followed by banking institutions (26.0%), provincial governments (7.5%) and the federal government (5.8%).

Employment size influenced an enterprise's decision to invest in advanced technology. More than 6 in 10 large enterprises (those with 250 and more employees) invested in at least one advanced technology, while fewer than 3 in 10 small enterprises (those with 10 to 99 employees) did so. Small enterprises that invested in advanced technologies identified banking institutions as their main source of financing three times more often than did large enterprises.

Enterprises that did not use or plan to use advanced technology reported different reasons for not making capital expenditures compared with enterprises that used or planned to use advanced technology. Almost 7 in 10 enterprises that did not use or plan to use advanced technologies most commonly reported that these technologies were not applicable to their activities. On the other hand, one-third of enterprises that used or planned to use advanced technologies primarily reported the high cost of advanced technologies as the primary reason for not investing in them.

Available in CANSIM: tables [358-0400](#) to [358-0405](#), [358-0409](#), [358-0411](#), [358-0412](#), [358-0448](#) and [358-0455](#).

Definitions, data sources and methods: survey number [4223](#).

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).