

Industrial Water Consumption, 1999

Abstract

The industrial sector represents 16% of total freshwater consumption. The amount used reflects population distribution to some degree, but the high values in some watersheds far from the largest cities reflects the occurrence of resource-processing, a heavy user of water. In most cases, these facilities (mainly in the forest industry) were specifically located so as to be close to large water supplies.

Other Industrial Users of Water

On this map, industrial water consumption is considered to be the water use known as "manufacturing" in the set of principal water use categories for Canada. This use class accounts for about one-sixth (16%) of water used.

Figure 1 shows the principal water user classes of Canada. Industry is covered by three of these: in addition to manufacturing, thermal power generation is an industrial use, and a small part (17%) of municipal water use is also used by industry. This usage is not classed with manufacturing as it consists of water supplied directly by municipal water systems to small industrial concerns.

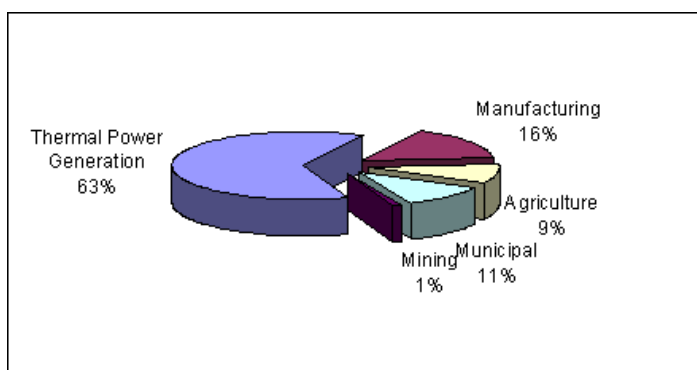


Figure 1. Principal Water Uses in Canada, 2000

Source: Environment Canada's Water Site - "Water Works for Us"

Thermal power generating, which includes both conventional and nuclear power generating plants, withdrew slightly more than 63% of the total water intake in 1991. Next to fuels, water is the most important resource used in thermal power production. Production of one kilowatt-hour of electricity requires 140 litres of water

for fossil fuel plants and 205 litres for nuclear power plants. A small amount of the water is converted to the steam which drives the generator producing the electricity. Most of the water, however, is used for condenser cooling.

Why is so much cooling necessary? Because generation processes can only convert 40% of the fuel's energy into usable electricity. The rest is waste heat. Water is used in large quantities to remove waste heat by cooling down the condensers. This requires a continuous flow of cooling water circulating through the condenser. All the cooling water is therefore returned to the environment much warmer. However, the temperature can also be reduced using cooling towers and other such devices.

Definition of underlined term

Industrial water use: In the Municipal Water Use Database, this refers to water used by industries connected to municipal water supplies. However, many industries have their own water supply system and are not included in this database.

Map Sources

Industrial water consumption (litres/day/person)

Environment Canada. 1999. The Municipal Water Use and Pricing Survey.

Industrial water use change in municipalities (1991 - 1999)

Environment Canada. 1999. The Municipal Water Use and Pricing Survey.

References

Canada. Environment Canada. Water Works! (<http://www.ec.gc.ca/eau-water/>)

Canada. Environment Canada. 2001. Urban Water Indicators: Municipal Water Use and Wastewater Treatment. National Environmental Indicator Series, SOE Bulletin No. 2001-1. Ottawa (<http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=32E1E173-1>).

Canada. Environment Canada. 2000. A Primer on Fresh Water: Questions and Answers. Fifth Edition. Ottawa (<http://www.ec.gc.ca/eau-water/>).

Canada. Environment Canada. 2001. Tracking Key Environmental Issues. 2001. Ottawa (http://www.ec.gc.ca/TKEI/toc/toc_e.cfm).

Federal-Provincial Task Force on the Importance of Nature to Canadians. 1999. The Importance of Nature to Canadians: Survey Highlights. Ottawa: Environment Canada (<http://www.ec.gc.ca/nature/highlights/highlite.html>).

Marsh, James H. (ed. in chief). 1985. The Canadian Encyclopedia. Edmonton: Hurtig.

Stanké, Alain (ed.). 2000. L'Encyclopédie Canada 2000. Montréal, Québec: Éditions internationales Alain Stanké.

Related Web sites (1999 – 2009)

Federal Government

Environment Canada. Freshwater Web Site

<http://www.ec.gc.ca/eau-water/>

This web site gives access to the nature of water, water policy and legislation, the management of water, water and culture, and informational resources and services.

Environment Canada. Freshwater Website. Municipal Water Use Database

<http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=C0788E25-E527-42CC-A136-75368C6177E6>

The Municipal Water Use and Pricing Survey has been conducted by Environment Canada every two or three years since the early 1980s. The survey has included all municipalities in Canada with populations greater than 1000 (over 1300 municipalities on the latest survey). Questions on the survey relate to wastewater and water – use, treatment and pricing. This is a voluntary survey, but traditionally the response rate has been high, over 80%. Data collected from the 1999 survey is available on the web.

Environment Canada. Quebec Region. The St. Lawrence Centre

<http://www.universadecouvrier.gc.ca/page/index.php?l=e&p=86>

The St. Lawrence Centre studies the ecosystems of the St. Lawrence River and conduct research programs with the aim of better understanding how these ecosystems function, and maintaining knowledge of the St. Lawrence River up to date.

Environment Canada. The National Water Research Institute

<http://www.ec.gc.ca/inre-nwri/>

The National Water Research Institute (NWRI) is Canada's largest freshwater research establishment. NWRI conducts a comprehensive program of research and development in the aquatic sciences, in partnership with the Canadian and international science communities.

Fisheries and Oceans Canada. Canadian Hydrographic Service (CHS)

<http://www.dfo-mpo.gc.ca/regions/central/science/chs-shc/index-eng.htm>

The CHS is responsible for charting Canada's 243,792 kilometres of coastline (the longest of any country in the world) and 6.55 million square kilometres of continental shelf and territorial waters (the second largest in the world) and an extensive system of inland waterways.

Other

University of Guelph. Canada's Aquatic Environments

<http://www.aquatic.uoguelph.ca/index.htm>

This site, at the University of Guelph, gives information on lakes, rivers, wetland regions and aquatic animals and plants.

Inter-agency

International Joint Commission

<http://www.ijc.org/>

The International Joint Commission is an independent binational organization established by the Boundary Waters Treaty of 1909. Its purpose is to help prevent and resolve disputes relating to the use and quality of boundary waters and to advise Canada and the United States on related questions.

