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LIFE-CYCLE STUDIES

Bottled Water

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Bottled Water

Overview

Seventy percent of the Earth's surface is covered with water, but more and more people now get theirs out of bottles. Global consumption of bottled water is rising about 12 percent per year, supported by annual spending of about \$35 billion. Drivers include cheap and convenient packaging, water shortages, and, in some parts of the world, serious concerns about water quality. (About 1.5 billion people lack access to safe drinking water and millions die every year from diseases linked to tainted water.) Many Americans who drink bottled water believe that it is safer than tap water, although a study of a thousand bottles sold in U.S. stores revealed known and/or possible carcinogens in a fifth of them.

Closing the Loop?

Bottle recycling bills have been enacted in Austria, Belgium, Canada, Denmark, Finland, Germany, the Netherlands, Norway, Sweden, Switzerland, and 11 U.S. states. In West Bengal, India, the Pollution Control Board last year issued a ruling that bottle producers were responsible for collecting used bottles and recycling them.

▶ As for the water itself: According to the World Wildlife Fund, 75 percent of bottled water is produced for local consumption. Even so, no bottled water production system can be as efficient as public drinking water systems. If the spreading popularity of bottled water represents a private solution to the failure of public infrastructure, the more effective answer would be to build or overhaul the public systems.

Claro Cortes IV, ©REUTERS 2001



Jeff Topping, ©REUTERS 2002



For people who perspire, the water bottle is now ubiquitous and de rigueur.

Fates

Bottles made from PET are recyclable (they're labeled with a 1 in the recycle triangle). Yet of the 14 billion water bottles sold in the United States in 2002 (most made from PET), 90 percent wound up in the trash.

Raw Materials

Bottled water comes in three basic forms. *Natural mineral water* generally contains steady concentrations of minerals (in the United States, 250 parts per million total dissolved solids); these are thought by some people, without much evidence, to be healthful. Sources are supposed to be pollution free, though the water may contain naturally occurring bacteria. *Spring water* also comes from underground sources but need not contain minerals. *Purified water*—essentially the same as tap water—can be drawn from almost any source (surface or underground) and is treated to make it potable.

▶ All three kinds of water are usually marketed in plastic bottles made from polyethylene terephthalate (PET) resin. Sales of PET more than doubled during the 1990s, reaching 738 million kilograms in 1999.

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PET unleashed: Sales of polyethylene terephthalate bottles have soared.

Production and Distribution

Making the bottles from PET means releasing significant amounts of air pollutants. The manufacture of one kilogram of PET (enough to make about 17 1.5-liter bottles) entails the release into the air of 40 grams of hydrocarbons, 25 grams of sulfur oxides, 18 grams of carbon monoxide, 20 grams of nitrogen oxides, and 2.3 kilograms of carbon dioxide. All have direct or indirect effects on climate.

▶ The growing popularity of bottled water has prompted worries about the strain on certain water supplies. Several Canadian provinces with abundant fresh water have considered or implemented bans on exports of fresh water to head off exploitation by multinational beverage corporations.

▶ The transport of the materials for making the bottles, and of the filled bottles to market, both require substantially greater expenditures of energy than would be used in piping water to consumers.

—This life-cycle based on research conducted by Paul McRandle of *The Green Guide*