

Overview of Glycol Ethers

Glycol ethers are a group of water-soluble organic compounds that have many uses, including as solvents and as ingredients in cleaning compounds and paints. Certain glycol ethers are considered toxic, and therefore reportable under the Toxics Release Inventory (TRI). Industries that report large quantities of glycol ether waste managed to TRI include fabricated metal manufacturers, chemical manufacturers, and transportation equipment manufacturers.

Both short- and long-term exposure to toxic glycol ethers can have adverse health effects. Short-term exposure can result in narcosis, pulmonary edema, and liver and kidney damage. Chronic long-term exposure to toxic glycol ethers can result in fatigue, lethargy, nausea, anorexia, tremor and anemia. Animal studies have also reported reproductive and developmental effects from inhalation and oral exposure.¹

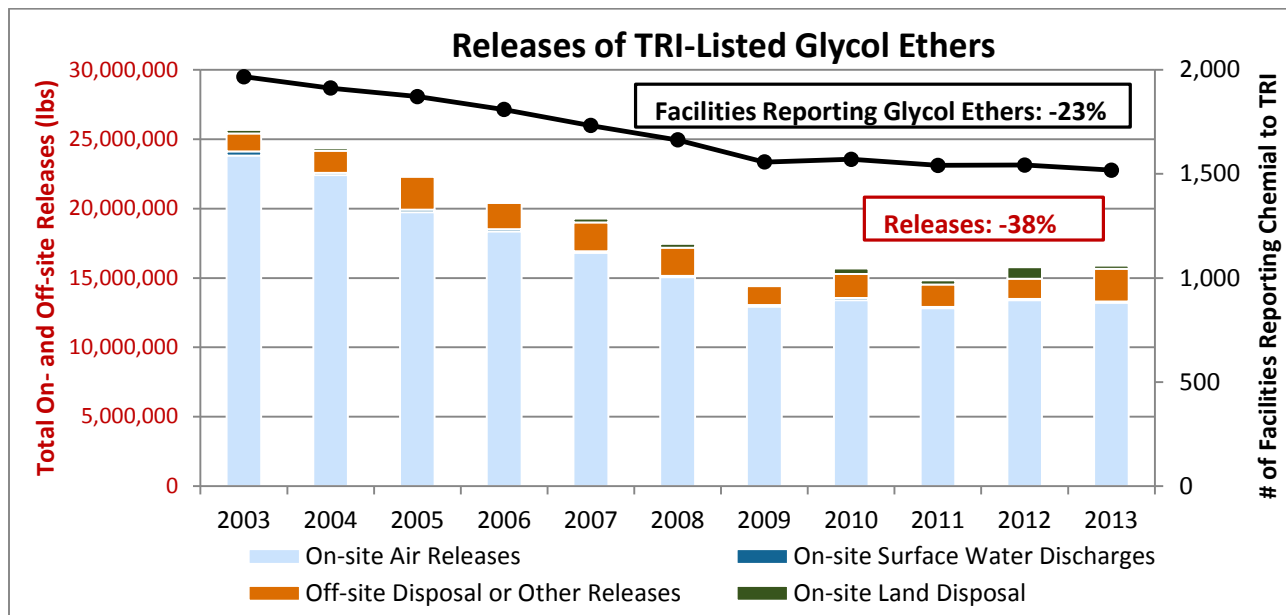
Glycol Ethers Reported to the Toxics Release Inventory (TRI)

The TRI Program requires reporting on two individually listed glycol ethers² and the chemical category “certain glycol ethers.” The category is defined by a chemical formula and includes hundreds of individual chemicals. For additional guidance on the chemicals included in the certain glycol ethers category, see the [TRI Glycol Ethers guidance document](#).

The quantity of glycol ether releases reported to TRI has decreased significantly in recent years. From 2003 to 2013, the total quantity of glycol ethers released on- and off-site decreased by 38%, from 26 million pounds to 16 million pounds, and the quantity of production-related waste (which includes quantities recycled, used for energy recovery, treated and released) decreased by 55%, from over 252 million pounds to 113 million pounds. Over that same time period, the number of facilities reporting glycol ethers to TRI also decreased considerably, even as 65% of the facilities that stopped reporting glycol ethers continued to report other chemicals to TRI. The reduction in glycol ether releases can thus be partly attributed to facilities reducing their use of glycol ethers below the reporting threshold, rather than simply closing.

Quick Stats for 2013

- **1,518 facilities** reported glycol ethers to TRI
- **314** newly implemented source reduction (P2) activities were reported by 208 of these facilities
- Facilities reported a **38% decrease** in glycol ether releases from 2003 to 2013 and a **55% decrease** in total waste managed



¹ EPA’s hazard summary of glycol ethers, <http://www.epa.gov/ttnatw01/hlthef/glycolet.html>

² The two individually listed glycol ethers are 2-methoxyethanol (CAS 109-86-4) and 2-ethoxyethanol (CAS 110-80-5)

Commonly Reported P2 Activities for Glycol Ethers

In 2013, 14% of facilities reporting glycol ethers also reported newly implemented source reduction (P2) activities. Commonly reported activities include changing paints, coatings, cleaning materials or product formulations to reduce glycol ethers use. Facilities also reported changing production schedules to minimize equipment, feedstock and/or color changes, which reduces the use of glycol ethers for cleaning.

Facilities have the option to submit more details describing their P2 efforts. Example P2 projects include:

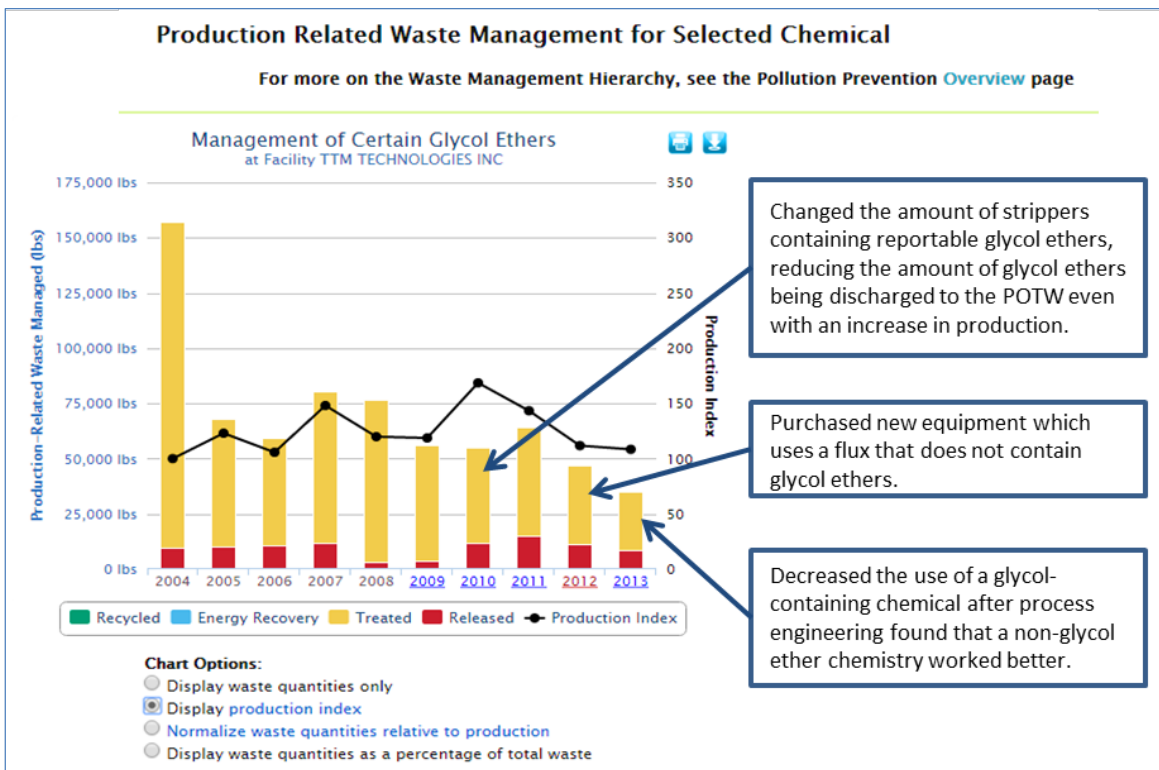
- A [kitchen cabinet and countertop manufacturer](#) replaced its primary cleaning solution with a new solution that does not contain glycol ethers.
- A [burial casket manufacturer](#) reduced the number of color changeovers through batch production and increased its first-pass yield, reducing its releases of glycol ethers.
- Over several years, a [printed circuit board manufacturer](#) changed equipment and process chemistry to reduce the quantity of glycol ethers used.
- A facility that manufactures [aluminum building materials](#) installed a new paint line, significantly reducing glycol ether air emissions.

You can find these examples and more using EPA's P2 Search Tool. An example P2 report annotated with descriptions provided by the facility is shown below. To learn more about TRI and Pollution Prevention, visit www.epa.gov/tri/p2.

Pollution Prevention at Nordic Ware



Nordic Ware is a kitchenware manufacturer based in Minneapolis. This facility worked with its suppliers to reduce the amount of glycol ethers in its coatings and found new cleaning solutions with lower quantities of glycol ethers. By 2013, Nordic Ware decreased the quantity of glycol ethers used on-site to levels below the TRI reporting threshold. Watch [TRI's P2 video](#) to learn more!



Note that not all substitutes for glycol ethers are necessarily safer. EPA's [Safer Chemical Ingredient List](#) includes a list of safer solvents that may provide options for companies looking to make substitutions, depending upon the application.

Find more P2 examples using the P2 Search Tool at: www.epa.gov/tri/p2