

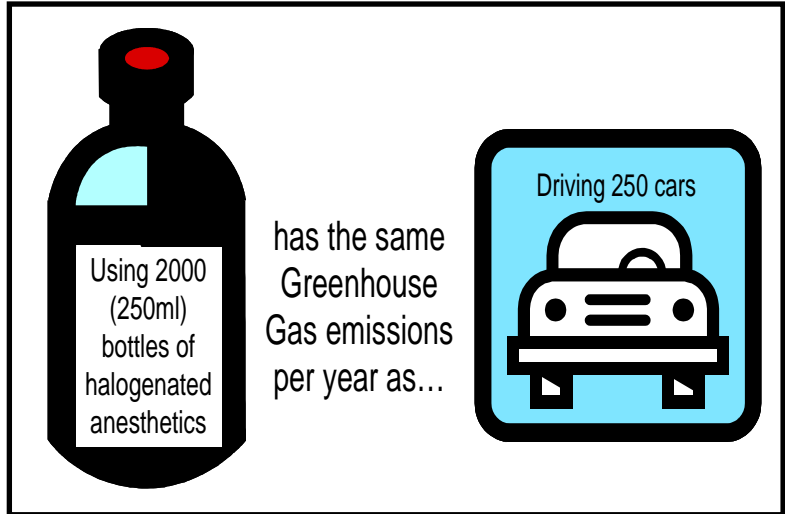
Hospital Anesthetic Gas Discharges and the Environment: *Prevent the Vent*

This Fact Sheet will help healthcare professionals understand the impact of anesthetic gas practices on the environment and identify a solution to reduce greenhouse gas emissions from those practices.

Healthcare professionals have the unique expertise needed to improve the health and wellbeing of all individuals, while also playing an important role in preventing illness and disease. To help meet these two objectives Blue-Zone Technologies offers healthcare professionals an opportunity to reduce greenhouse gases (GHGs) and emissions of smog precursors by using innovative Deltasorb™ anesthetic agent recovery technology in advanced anesthesiology practices.

Greenhouse gas emissions from all sources contribute to global warming and climate change. The Canadian Public Health Association predicts that increased temperatures from global warming and climate change will contribute to increased deaths and illness from heat stress, increased weather disasters, increased spread of tropical diseases, and lack of access to food, fresh water and safe housing (“Climate Change, Air Pollution and Your Health”. *Canadian Journal of Public Health*. 2001; 92(3):1-12). Hospital activities which can result in the emission of GHGs include use of fossil fuels for space and water heating, electrical needs, transportation of goods and services, and operating room practices. Smog precursors such as

oxides of nitrogen and Volatile Organic Carbons contribute to poor air quality locally and have a direct impact on human health including irritation of eyes, nose and throat; breathing difficulties and worsening of existing lung and heart problems (“Air Pollution and Your Health”. *Canadian Public Health Association*). These emissions contribute to climate change globally and poor air quality locally.



Anesthetic Agents are Greenhouse Gases and Smog Precursors

Anesthetic agents used today are volatile halogenated ethers, known to be aggressive GHGs. Anesthetic agents and the common carrier gas nitrous oxide also contribute to smog. With less than 5% of the total delivered halogenated anesthetic being metabolized by the patient, the vast majority of the anesthetic is routinely vented to the atmosphere through the operating room scavenging system.

Hospital Anesthetic Gas Discharges and the Environment F a c t S h e e t

January 2005

Anesthetic Agents Contribute to Climate Change

GHGs absorb infrared radiation and then re-emit heat energy to the atmosphere. The effect is a local trapping of energy and a warming of the earth's surface.

GHGs contribute to the greenhouse effect which maintains the earth's surface temperature sustaining all living things. The more GHGs there are, the more the earth's surface heats up.

The global warming potential of halogenated anesthetics is up to 2,000 times greater than carbon dioxide (CO₂). Global warming potentials are used to compare the strength of different greenhouse gases to trap heat in the atmosphere relative to that of CO₂. The anesthetic gas emissions from 1100 hospitals across Canada per year are estimated to be over 1.1 million tonnes of CO₂ equivalent.

Global Warming Potentials of Anesthetic Gases:

Isoflurane : 1100 x CO₂

Desflurane: 1900 x CO₂

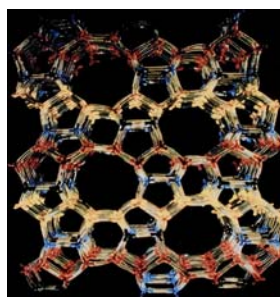
Sevoflurane: 1600 x CO₂

Nitrous Oxide: 296 x CO₂

Intergovernmental Panel on Climate Change (2001)

Blue-Zone's Technology is a Solution for this Global Environmental Problem

Blue-Zone's globally patented Delta™ technology provides the selective adsorption of halogenated anesthetic gases, utilizing a unique crystalline silica molecular sieve, known as Deltazite™. This inert material selectively adsorbs each volatile anesthetic from the scavenging circuit in a portable, non-pressurized Deltasorb™ canister and, thereby, has the potential to virtually eliminate this class of GHG emissions.



Deltazite™ Crystal Structure and Deltasorb™ Canister

Pollution Prevention (P2)

P2 is the use of processes, practices, materials, products substances or energy that avoid or minimize the creation of pollutants and waste and reduce the overall risk to the environment or human health. (*Canadian Environmental Protection Act, 1999*). A P2 assessment will help determine your opportunities to reduce GHGs, smog precursors and other emissions.

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