



**Memo**

**To:** Comments, California Environmental Protection Agency  
**From:** Walt Vernon, Principal, Mazzetti & Associates Climate Change Consultants  
**Date:** 08-06-08  
**Re:** Potential Healthcare Offsets  
**cc:** non

### I. Summary Recommendation

Allow emission offsets to be traded that result from the capture of the halogenated ethers used for anesthetics in hospitals. This can be done for little cost, and is one of the few low-cost alternatives available to healthcare for reducing their global warming impact. It allows a win-win situation; the healthcare organization can reduce its global warming impact at low cost, and monetize these reductions to offset their costs. It makes low-cost offsets available to other industries. It creates a real, long-term reduction in greenhouse gas emissions.

### II. Background

Healthcare organizations have a unique opportunity to make a fairly dramatic, fairly simple, fairly inexpensive, emissions reduction that is presently ignored as an accident of history. Healthcare organizations are otherwise heavily regulated, due to the needs to focus on eliminating the possibilities of cross-contamination between patients, and on ensuring the health and safety of the patients, visitors, and care-givers in the buildings. As a result, they have relatively few other ways to cost effectively reduce their emissions, in general.

Healthcare buildings use anesthetics to enable surgical procedures to occur. Three of these anesthetics are the halogenated ethers Desflurane, Sevoflurane, and Isoflurane. These gasses are 3,766, 349 and 1,230 times the Global Warming Potential per molecule as CO<sub>2</sub>. These gasses are recognized by the IPCC as Greenhouse Gasses, but they are not regulated by Kyoto, and so, there is no incentive for a hospital to make the minimal investment required to capture them.

Some estimates are that as much as 5-10% of a hospital's total climate change impact (in CO<sub>2</sub> Equivalents) comes from these anesthetics. About 5% of these gasses are absorbed by the patient, and the rest are removed from the room, generally into a general gas evacuation system. This gas evacuation system simply blows all of the exhaust, including the anesthetics, into the atmosphere.

A typical hospital emits between 5,000-10,000 tons CO<sub>2</sub>E's per year. That same typical hospital emits 1275 tons of CO<sub>2</sub>E of anesthetic gasses each year. With 441 hospitals in California, and 5,747 hospitals in the US, that equates to a total of 28,735,000 to 57,470,000 tons of CO<sub>2</sub>E per year that are completely ignored by the current regulations.

Capturing these gasses would require one of two alternatives. Either the gasses can be captured at the exhaust side on the anesthesia machine in the operating room, or all of the waste anesthetic gasses can be piped to a central location where the anesthetics can be captured before blowing the remaining air to the atmosphere. Both are possible at relatively low cost. However, despite the low cost, since there is no mandate to capture these gasses, and no incentive to do so, the hospitals are choosing to pursue the no-cost path of simply blowing the anesthetics into the air.

**MAZZETTI & ASSOCIATES**

CONSULTANTS&ENGINEERS

530 BUSH STREET, SUITE 300

SAN FRANCISCO, CA 94108-3623

TELEPHONE 415.362.3266

FACSIMILE 415.362.3267

<http://www.mazzetti.com>

SAN FRANCISCO

BATON ROUGE

DENVER

IRVINE

NASHVILLE

PORLAND

SACRAMENTO