Blue-Zone Technologies

SUSTAINABLE ANESTHESIA RECOVERY

Blue-Zone Overview 2023

Who is Blue-Zone

Blue-Zone Technologies
SUSTAINABLE ANESTHESIA RECOVERY

Our Vision:

Make a significant contribution to the health and well-being of the communities surrounding Blue-Zone Certified Healthcare facilities worldwide.

Why Blue-Zone Matters

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Over 69,000 Operating Rooms in North America[1]

Less then 5% of the anesthetics used are consumed by the patient[3]

The un-used anesthetic is typically removed from the Operating Room and vented into the environment[3]

[1]2016, iDataResearch
[2]Blue-Zone internal Research
[3]AIHA.ORG, White Paper, Vestion 1, October 28, 2021

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The U.S. health sector is responsible for an estimated 8.5% of national carbon emissions.[2]

"The most energy-intense part of hospital operations is the operating room".[1]

[1] Budd, K. (2019, October 15). Hospitals race to save patients - and the planet. AAMC. Retrieved November 18, 2022, from https://www.aamc.org/news-insights/hospitals-race-save-patients-and-planet

[2] Dzau, V. J., Levine, R., Barrett, G., & Witty, A. (2021). Decarbonizing the U.S. health sector — a call to action. New England Journal of Medicine, 385(23), 2117-2119. https://doi.org/10.1056/nejmp2115675

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Operating rooms are a massive source of greenhouse gas production for hospitals, representing

70%

of their waste and generating three to six times as much carbon as the rest of health systems. [3]

Anesthetic gases make up

51%

of an average U.S. operating room's GHG emissions.[4]

[3] https://ihpi.umich.edu/news/operating-rooms-are-climate-change-contributor-no-ones-talking-about

[4] https://practicegreenhealth.org/sites/default/files/2019-04/anesthetic_gas_how-to.pdf

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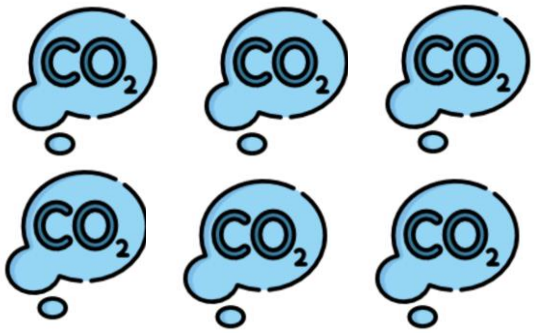
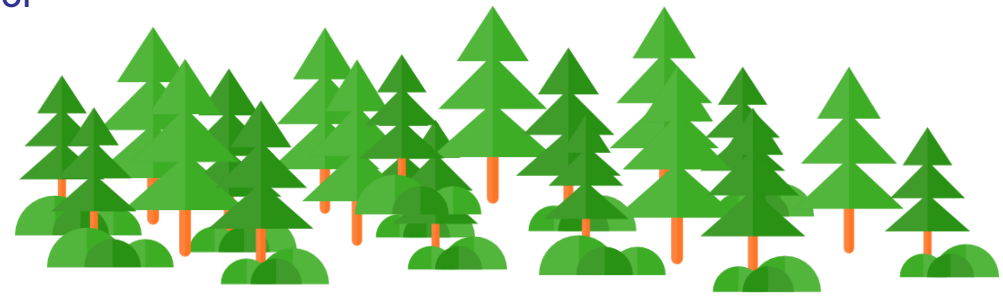
Waste Anesthetic Gases (WAG) have a Global Warming Potential 1000's of times more potent than CO_2[4]



Hospital Utilization of Inhalation Anesthetics continues to increase annually[6].

The North American contribution of WAG vented into the environment has an annual Global Warming Potential of almost 1 Million Metric Tons of eCO2[4]

45 Million Trees would have to be planted annually to offset the North American WAG[5]



[4]*Can J Anesth, https://doi.org/10.1007/s12630-019-01385-w*
[5]*https://www.encon.be/en/calculation-co2-offsetting-trees*
[6]*https://www.ameriresearch.com/inhalation-anesthesia-market/*

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Long-term exposure to low-dose WAG is a recognized occupational health risk[7].

The possible effects after exposure to anaesthetic gases[7]:

- organ toxicity,
- hepatotoxicity,
- nephrotoxicity,
- genotoxicity,
- pulmonary toxicity,
- chromosome aberrations,
- micronuclei formation,
- sister chromatid exchange, and
- carcinogenesis.
- increase in spontaneous miscarriages
- congenital anomalies owing to the effects on the reproductive system

Communities surrounding hospitals are typically unaware of these health risks!!

[7] *Turk J Anaesthesiol Reanim. 2021 Apr; 49(2): 93–99.*

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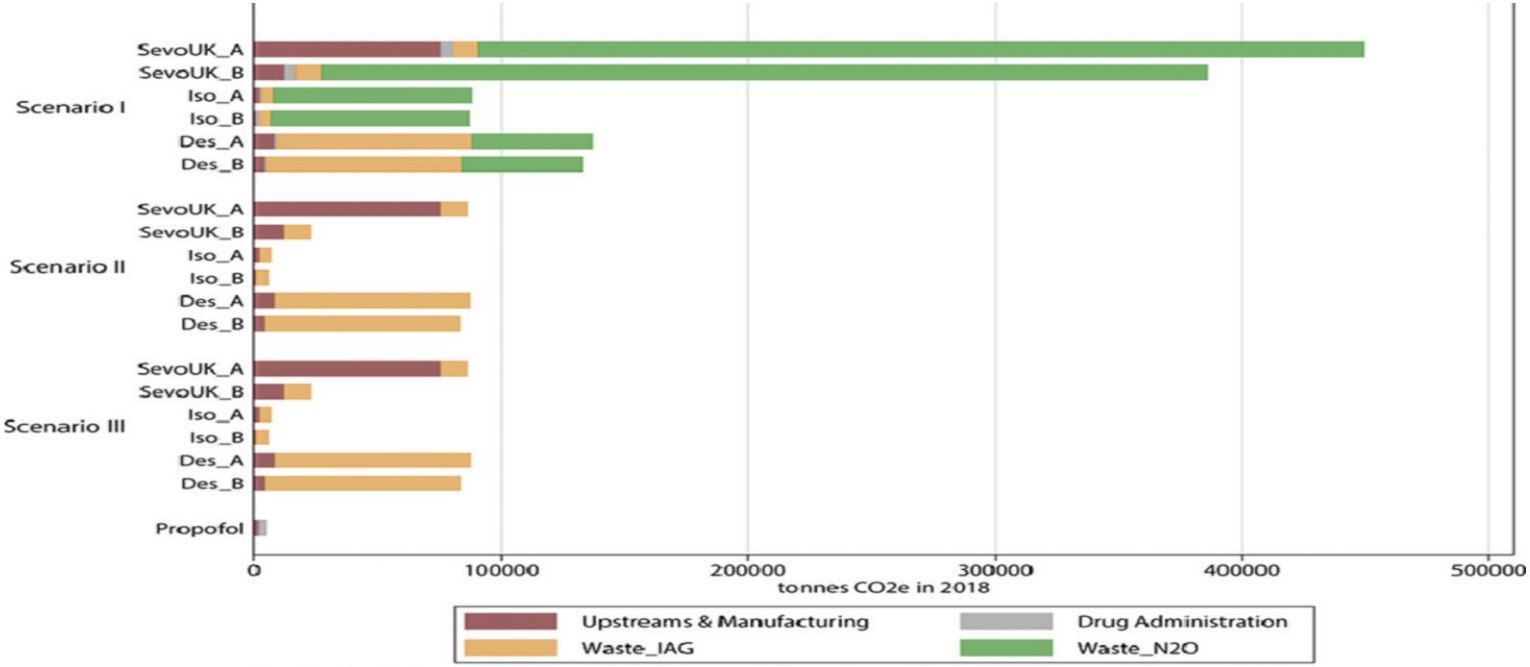
- Market is dominated by a few suppliers who have limited production facilities worldwide
- Conventional anesthetic manufacturing processes can contribute an additional carbon footprint[9] equivalent to WAG emissions from hospital sources.

Baxter
abbvie
Piramal

Carbon Footprint of IAGs [9]



[9] https://doi.org/10.1016/j.resconrec.2021.105411

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What if you could:

- Eliminate 100% of the WAG emissions from every hospital?
- Provide a sustainable, environmentally conscious source of inhalation anesthetics

The Blue-Zone Solution

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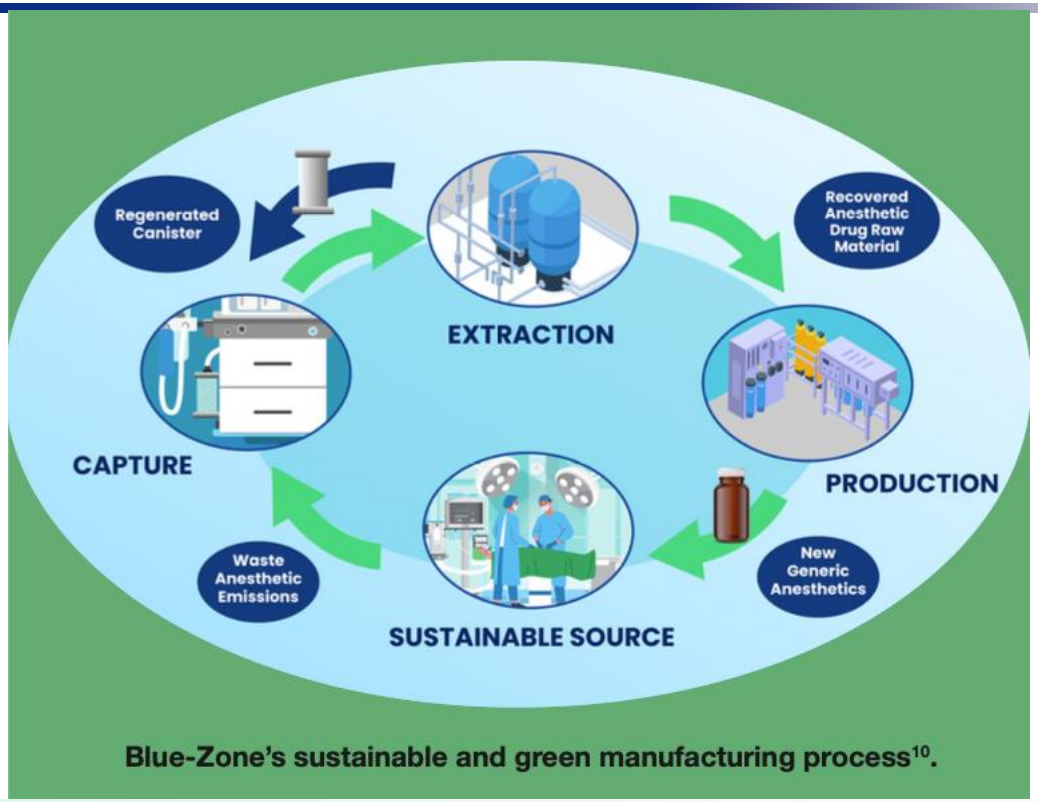

Blue-Zone's sustainable and green manufacturing process[10].

Blue-Zone's globally patented Deltasorb® and Centralsorb® technology captures up to 100% of the Waste Anesthetic Gases^ that would normally be vented into the environment and process the collected material into its pure form providing a sustainable and cost-efficient source of inhalation anesthetic drugs*.[5]

[5] A 'Greener' Anesthesia Through Capturing of Volatile Anesthetics Lauren Della Mora; Claude Laflamme, MD, FRCPC, MHSc; George Davis, RTTech; Elihu Henry, AA/RT Sunnybrook Research Institute, Toronto, Ontario

[10] Blue-Zone's Life Cycle Analysis, Available upon request

The Blue-Zone Solution - LCA

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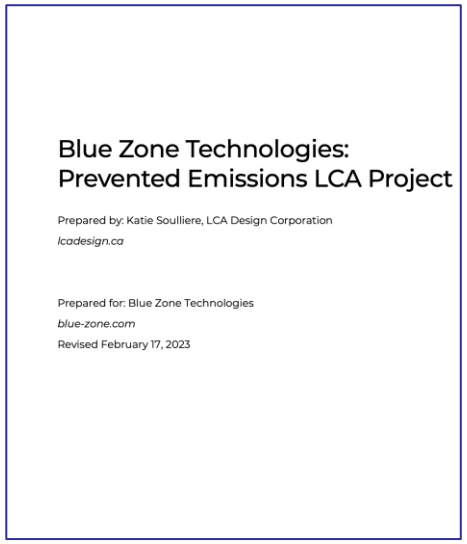
Blue-Zone's Life Cycle Analysis[10]

ISO standard for Carbon Footprint (ISO 14067) outlines the methodology to quantify the Carbon Footprint of Products (CFP), in conformity to the ISO standard for Life Cycle Analysis (ISO 14040/44) and was utilized for this project.


Blue Zone Technologies:
Prevented Emissions LCA Project

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Prepared for: Blue Zone Technologies
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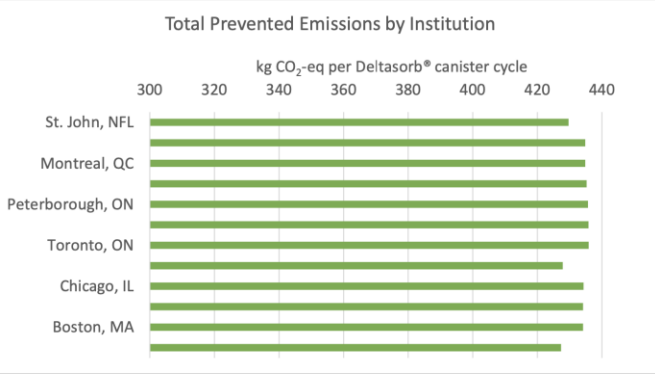
Revised February 17, 2023

Bottom Line:

- Based on the GWP values for anesthetic gases, the avoided emissions from capturing instead of releasing the anesthetic gases is 437.17 kg CO2- eq./Deltasorb® canister cycle.
- The total prevented emissions ranges from 427.35-435.89 kg CO2-eq/Deltasorb® canister cycle based on institution location.
- The total prevented emissions is 97.75% - 99.71% of the avoided emissions.
- **The Deltasorb® canister reduces the impacts from the anesthetic gases by approximately 99%.**



[10]Blue-Zone's Life Cycle Analysis, Available upon request

Blue-Zone's Value Proposition

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Example: British Columbia, Canada

Insert Values in Green Cells		
# of ORs		360
% AA Available to Capture (Vented)		70%
BZ's Discount on Future Generic Drug (%)		30%
Collection Service Fee ($/month/OR)	$	200.00
Des Price / bottle (240ml)	$	120
Sevo Price / bottle (250ml)	$	143
Iso Price / Bottle (100ml)	$	20
# of Bottles of Des / year		5760
# of Bottles of Sevo / year		23040
# of Bottles of Iso / year		0
Des expenditure	$	691,200
Sevo expenditure	$	3,294,720
Iso expenditure	$	-

GWP Source	eCO2 Prevented/OR
Ozelsel 1	106.9152

Automatically Calculated		
Litre of Des		1,382
Litre of Sevo		5,760
Litre of Iso		0
Percent Desflurane Used		19%
Percent Sevoflurane Used		81%
Percent Isoflurane Used		0%
Total Litre		7,142
Total Drug Expenditure	$	3,985,920
Average $/L of Anesthetics	$	558
Annual Hospital Drug Usage (L)		7,142.4
Hospital Total Anesthetic Captured (L)		4,999.7
Hospital Annual Drug Savings ($)	$	1,195,776
eCO2 prevented (metric tons)		38,489.5
Annual Collection Service fee	$	(864,000)
Cost Dollars / Ton eCO2	$	22.45
Annual Hospital Cost Savings	**$**	**331,776**

Trees planed annually to offset Carbon Footprint	230,936.8

Technology Traction

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UHN

CHUM
Centre hospitalier
de l'Université de Montréal

CHEO

PRHC
Peterborough Regional
Health Centre

Sunnybrook
HEALTH SCIENCES CENTRE
when it matters
MOST

KAISER
PERMANENTE

JESSE BROWN
VETERANS AFFAIRS MEDICAL CENTER
Putting Veterans first

Eastern
Health

Interior Health

Get Certified!

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Blue-Zone Technologies is the worlds first and only Cleantech Pharmaceutical Company!

To become a Blue-Zone Certified Institution
Contact us at:

health@blue-zone.ca

www.blue-zone.com

Deltasorb® WAG Collection

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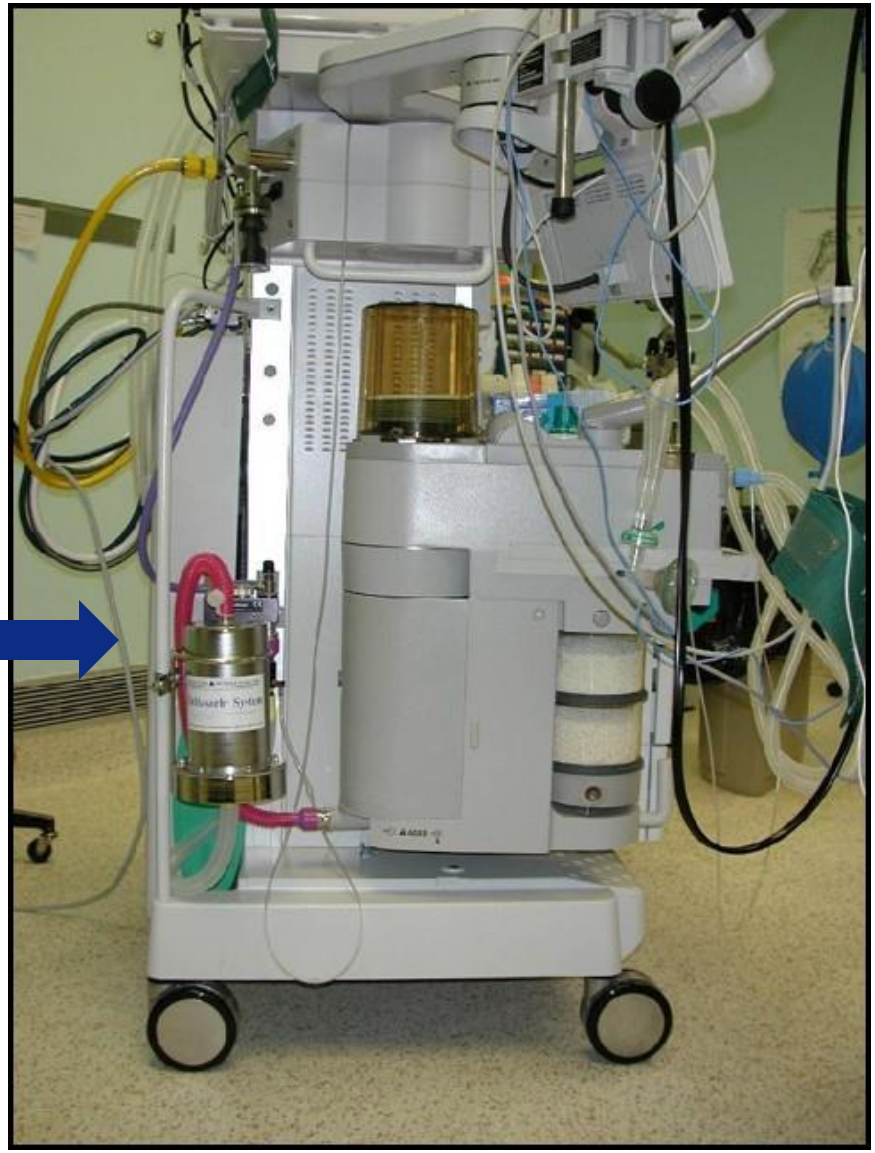
Attaches to the outflow of Anesthesia Machine in OR



Centralsorb ® WAG Collection

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Attaches to the dedicated AGSS prior to venting