

# Sustainability for Health

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The GE Healthcare  
Critical Care Journey



# The world's healthcare systems account for approximately 5%<sup>1</sup> of global CO<sub>2</sub> emissions

These emissions arise directly from healthcare facilities, as well as indirectly from the supply chain of health care goods and services.

More than 200 medical journals<sup>2</sup> recently issued a joint statement calling for emergency action on climate change, **not only from Governments, but also from Healthcare Professionals, Systems and Industries.**

## Climate change is affecting the health of everyone.

As the climate changes, the risks to human health will grow, exacerbating existing health threats and creating new public health challenges.

BY 2050, CLIMATE CHANGE IS EXPECTED TO CAUSE APPROXIMATELY :

**250,000**  
additional deaths per year<sup>3</sup>

from malnutrition, malaria, diarrhoea, and heat stress making us all more vulnerable to diseases.

(1) [www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(20\)30271-0/fulltext](http://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30271-0/fulltext)

(2) <https://www.bmj.com/content/374/bmj.n2177>

(3) [www.who.int/health-topics/climate-change#tab=tab\\_1](http://www.who.int/health-topics/climate-change#tab=tab_1)



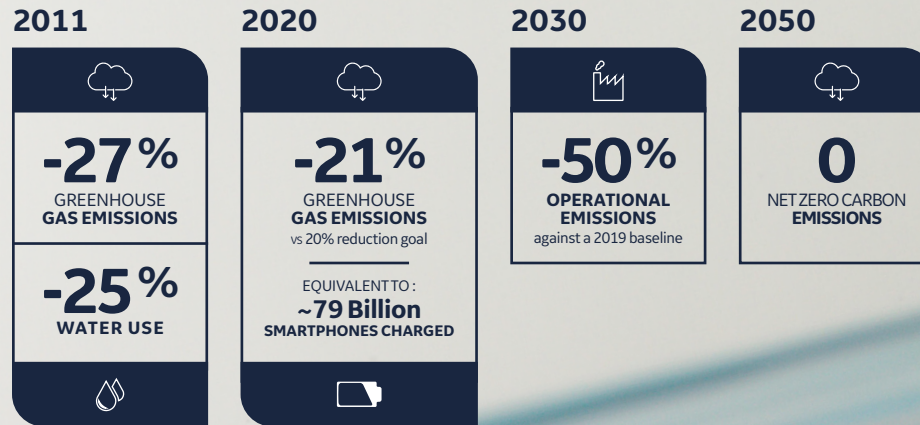
As a leading global medical technology company, we strongly believe that climate action is an integral part of our mission **to improve outcomes for patients, healthcare providers and researchers.**

# GE Healthcare has committed to <sup>4</sup>

## Apply a Strong Policy

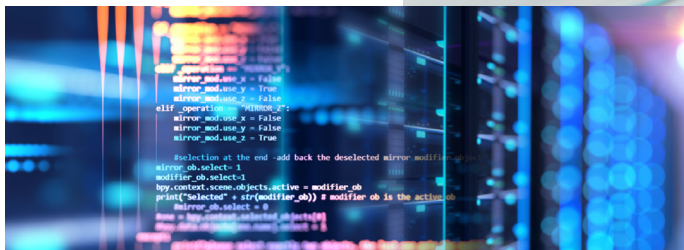
... To reduce emissions in line with the Paris Agreement with transparent action plans and robust near-term targets.

Achievements and commitments →

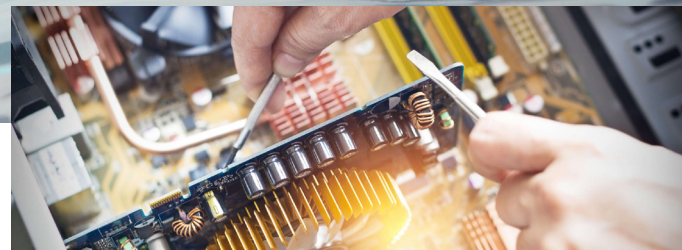


## Build a sustainable healthcare strategy from both sides healthcare systems and industries by:

### 01. MAXIMIZING EFFICIENT USE OF EQUIPMENT



### 02. MINIMIZING WASTE



# 01

## Innovation that helps reduce anaesthetic gases emissions.

Most organic anaesthetic gases that include the 3 most commonly used for surgery (Isoflurane, Sevoflurane, and Desflurane), remain for a long time in the atmosphere,

where they have the potential to act as greenhouse gases.

10,000 ANAESTHESIA MACHINES IN USE WITH AN AVERAGE FRESH GAS FLOW OF 3 L/MIN<sup>5</sup> GENERATES :

**51 MT** /year  
CO<sub>2</sub> EMISSION

What if that average FGF rate could be reduced to 2 or 1 l/min?

>> We would probably see a 60% reduction in gas emission ! 😊👍

How could we do that ?

Through INNOVATION !

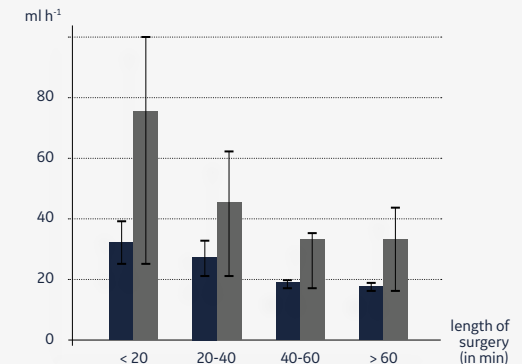
INNOVATIVE TOOLS and INTELLIGENT MONITORING 🔍  
>> to minimize drug consumption and support practice changes

For example tools that help clinicians semi-automate MINIMAL FLOW ANAESTHESIA

In the case of Desflurane : Liquid volatile anaesthetic usage drop by 50% after introduction of a low flow semi-automated tool<sup>6</sup>:

### DESFLURANE<sup>6</sup>

- End Tidal Control<sup>7</sup> (tool that semi-automates low flow anaesthesia)
- Fresh Gas flow manual delivery



(5) Ryan MS, Nielsen CJ. Global warming potential of inhaled anesthetics: application to clinical use. Anesth Analg. 2010;111:92-98

(6) Changing Patterns in Anesthetic Fresh Gas Flow Rates Over 5 Years in a Teaching Hospital. Kennedy , French. Anesthesia & Analgesia Vol. 106, No. 5, May 2008<sup>†</sup> Et Control ('Et Control', 'EtC') or TCA is not available in all markets. Not for sale in the US. Not cleared by the US FDA. 2) Automated control of end-tidal inhalation anaesthetic concentration using the GE Aisys CarestationTM<sup>†</sup> 10.1093/bja/aes464 Jan 2013

(7) End Tidal Control is not available in all markets. Not approved by the US FDA. Not for sale in the United States.



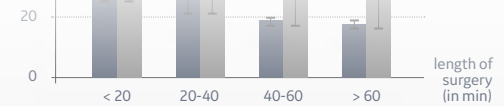
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The data derived from Carestation™ Insights has **profoundly altered our understanding of how our anaesthesiologists are conducting volatile based anaesthesia.**

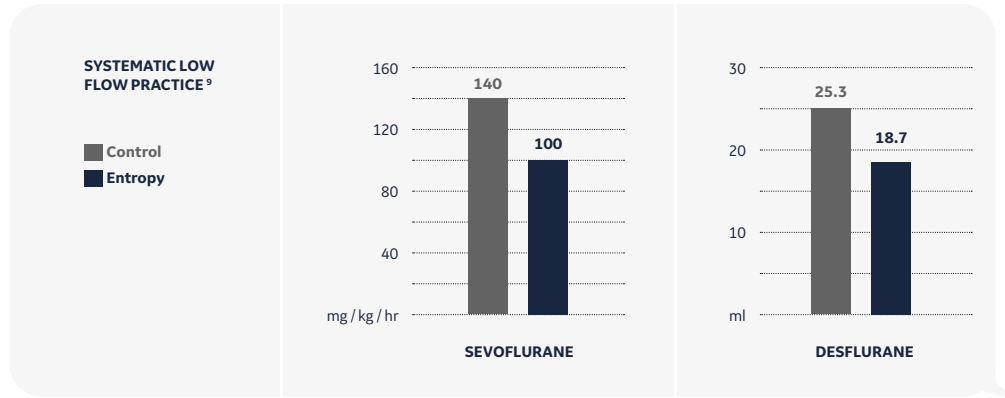
It's allowed<sup>9</sup> specific **educational interventions**, which have provided an immediate reduction in fresh gas flow rates.

Our facility has traditionally had low mean fresh gas flows when audited, so being able to reduce this further is a testament to the power of high quality data collected from large numbers of cases.

- Dr Richard French



**AND TOOLS THAT SUPPORT SYSTEMATIC LOW FLOW PRACTICE ... to remove the operator variability and standardize low flow and drug reduction practice.**  
**Have a look: Patients with spectral entropy monitoring, required 24% less sevoflurane vs control group**



**...and consumption of desflurane was significantly less in the entropy-guided group, compared with the minimal alveolar concentration-guided group**

What else ?

**TRANSFORMING COMPLEX DATA INTO ACTIONABLE INSIGHTS**

**for ensuring that all anaesthesia equipment is being utilized to the state of art and with more environmentally friendly practices**

**Systems that leverage data from connected devices to make it accessible for deep analysis like cloud-based analytics applications and dashboards could transform complex data into actionable insights to broaden environmentally friendly practices**

(8) The effect of fresh gas flow during induction of anaesthesia on sevoflurane usage: a quality improvement study\* R. R. Kennedy,1 R. A. French,2 G. Vesto,3 J. Hanrahan4 and J. Page5 Anaesthesia 2019  
 (9) M. Shivangi and al., Effect of entropy-guided low-flow desflurane anaesthesia on laryngeal mask airway removal time in children undergoing elective ophthalmic surgery - A prospective, randomised, comparative study. Indian J Anaesth. Jun 2019; 63(6): 485-490.

MEDICAL GASES ACCOUNT FOR:

**5%**  
OF THE CARBON DIOXIDE EQUIVALENCE  
EMISSIONS OF ACUTE NHS HOSPITALS<sup>10</sup>

And I can imagine you have an answer to that too!

Implementing preventive practices and simple strategies can promote a safe and healthy environment

For example choosing green CO<sub>2</sub> absorbers<sup>11</sup> that reduce the carbon footprint. It has been calculated that replacing a standard soda lime with AMSORB® Plus, may lead to:



Annual Sevoflurane saving for 25 theatres estimated to be 38,661 mL (154 bottles) equivalent to 25 flights from London to New York.<sup>12</sup>



- > With no strong alkali<sup>14</sup> present to enable reduced adsorption of anaesthetic vapour.
- > With permanent color change so that it can be replaced when it is completely depleted.
- > Autofilled canisters to ensure reduced intergranular space, maximising absorbent weight per canister and optimising gas flow with improved absorption efficiency.

(10) <https://anaesthetists.org/Home/Resources-publications/Environment/Our-environmental-work/Why-it-matters-facts-figures>

(11) Jones A, Dobson A, Implications of using AMSORB® Plus in clinical practice: Cost, Patient Safety and Environmental Impact. Presented at the Royal College of Anaesthetists Winter Scientific Meeting, 4 Mannion S, Ahmed O. The cost implications of replacing soda lime with Amsorb® in clinical practice. European Journal of Anaesthesiology, June 2011;28:P12-13.

(12) [www.gehealthcare.co.uk/-/jssmedia/global/products/images/accessories--supplies/amsorb-plus-sustainable-anaesthesia-brochure\\_jb00241xe.pdf?rev=-1](http://www.gehealthcare.co.uk/-/jssmedia/global/products/images/accessories--supplies/amsorb-plus-sustainable-anaesthesia-brochure_jb00241xe.pdf?rev=-1)

(13) [www.gehealthcare.co.uk/-/jssmedia/global/products/images/accessories--supplies/](http://www.gehealthcare.co.uk/-/jssmedia/global/products/images/accessories--supplies/)

(14) Estimate based on 1 kg/OR per week x 3200 OR's = 166,400kg, 1.5 kg/OR per week x 3200 OR's = 249,600kg  
[amsorb-plus-sustainable-anaesthesia-brochure\\_jb00241xe.pdf?rev=-1](http://amsorb-plus-sustainable-anaesthesia-brochure_jb00241xe.pdf?rev=-1)

02.

# Reusing materials to minimize waste.

TO MANUFACTURE CHIP AND ELECTRONIC, A CHIP FABRICATION PLANT CAN USE:

**Millions**

GALLONS OF WATER / DAY<sup>15</sup>

**Huge amounts**

OF ENERGY (& AS MUCH WASTE)

Yes, but these products are necessary to save lives. In the end it's eco-friendly, no? 

Yes right. But when we change a monitor for a new one, the old one isn't necessarily useless.

 Most of the time it can be refurbished and find a new use

How to trust a refurbished device?

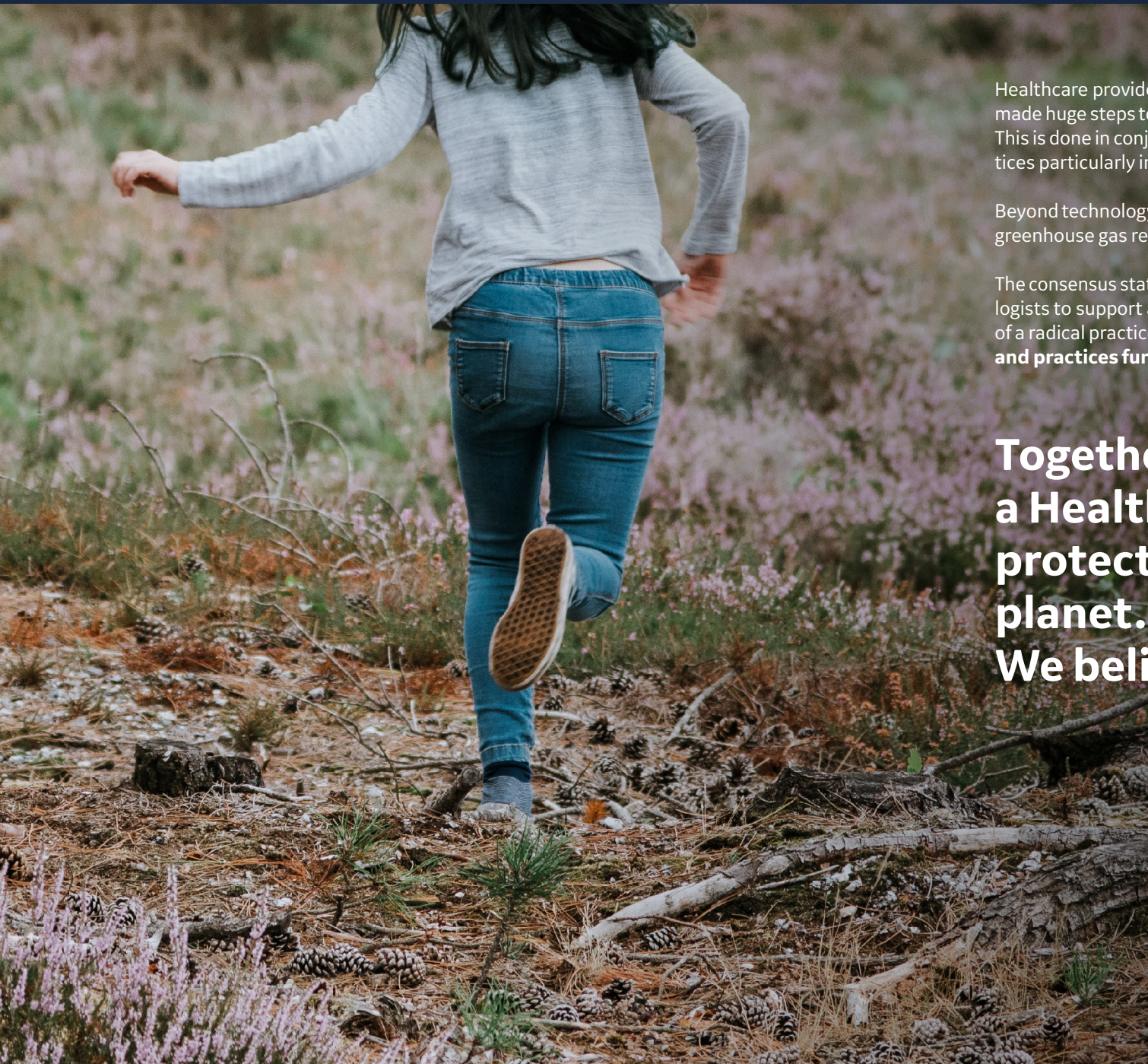
That's why we've promoted an initiative called GOLD SEAL<sup>4</sup>



>> REFURBISHED & UPGRADED, WITH ADDED WARRANTY

- > Assets are refurbished at GE dedicated Repair Operations Center, for the highest levels of oversight
- > They're upgraded with the latest technology
- > They're backed by the same warranty as new models





Healthcare providers and industries players like GE Healthcare already have made huge steps to intelligently transform the way patients are safely treated. This is done in conjunction with systematic environmentally sustainable practices particularly in anaesthesia which today is leading the way.

Beyond technology, GE Healthcare supports policies that promote ambitious greenhouse gas reduction goals.

The consensus statement of the World Federation of Societies of Anaesthesiologists to support an environmentally-sustainable anaesthesia is the premise of a radical practice change. **It is now time to expand these commitments and practices further and together!**

**Together, we want to achieve  
a Healthcare System that  
protects everyone and our  
planet.  
We believe this is possible!**





# Notes and references.

- 1 [www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(20\)30271-0/fulltext](http://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30271-0/fulltext)
- 2 <https://www.bmj.com/content/374/bmj.n2177>
- 3 [www.who.int/health-topics/climate-change#tab=tab\\_1](http://www.who.int/health-topics/climate-change#tab=tab_1)
- 4 [www.ge.com/sustainability](http://www.ge.com/sustainability)
- 5 Ryan MS, Nielsen CJ. Global warming potential of inhaled anesthetics: application to clinical use. *Anesth Analg.* 2010;111:92–98
- 6 Changing Patterns in Anesthetic Fresh Gas Flow Rates Over 5 Years in a Teaching Hospital. Kennedy , French. *Anesthesia & Analgesia* Vol. 106, No. 5, May 2008† Et Control ('Et Control', 'EtC') or TCA is not available in all markets. Not for sale in the US. Not cleared by the US FDA. 2) Automated control of end-tidal inhalation anaesthetic concentration using the GE Aisys Carestation™† 10.1093/bja/aes464 Jan 2013
- 7 Et Control was approved in the USA on 17 Mar. 2022.
- 8 The effect of fresh gas flow during induction of anaesthesia sevoflurane usage: a quality improvement study\* R. R. Kennedy,1 R. A. French,2 G. Vesto,3 J. Hanrahan4 and J. Page5 *Anaesthesia* 2019
- 9 M. Shivangi and al., Effect of entropy-guided low-flow desflurane anaesthesia on laryngeal mask airway removal time in children undergoing elective ophthalmic surgery – A prospective, randomised, comparative study. *Indian J Anaesth.* Jun 2019; 63(6): 485–490.
- 10 <https://anaesthetists.org/Home/Resources-publications/Environment/Our-environmental-work/Why-it-matters-facts-figures>
- 11 Jones A, Dobson A, Implications of using AMSORB® Plus in clinical practice: Cost, Patient Safety and Environmental Impact. Presented at the Royal Collage of Anaesthetists Winter Scientific Meeting. 4 Mannion S, Ahmed O. The cost implications of replacing soda lime with Amsorb® in clinical practice. *European Journal of Anaesthesiology.* June 2011;28:P12-13.
- 12 [www.gehealthcare.co.uk/-/jssmedia/global/products/images/accessories--supplies/amsorb-plus-sustainable-anaesthesia-brochure\\_jb00241xe.pdf?rev=-1](http://www.gehealthcare.co.uk/-/jssmedia/global/products/images/accessories--supplies/amsorb-plus-sustainable-anaesthesia-brochure_jb00241xe.pdf?rev=-1)
- 13 [www.gehealthcare.co.uk/-/jssmedia/global/products/images/accessories--supplies/](http://www.gehealthcare.co.uk/-/jssmedia/global/products/images/accessories--supplies/)
- 14 Estimate based on 1 kg/OR per week x 3200 OR's = 166,400kg, 1.5 kg/OR per week x 3200 OR's = 249,600kg amsorb-plus-sustainable-anaesthesia-brochure\_jb00241xe.pdf?rev=-1
- 15 [www.theguardian.com/environment/2021/sep/18/semiconductor-silicon-chips-carbon-footprint-climate](http://www.theguardian.com/environment/2021/sep/18/semiconductor-silicon-chips-carbon-footprint-climate)

