

# DO ALL SURGICAL SPECIALTIES HAVE AN IDENTICAL CARBON FOOTPRINT WITHIN AN AMBULATORY UNIT ?

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## INTRODUCTION



### HEALTHCARE SYSTEM

8,1% of the French greenhouse gas emission (GHG)



### OPERATING THEATER

21 to 30 % of the healthcare system's GHG emissions (1)



### COCHIN HOSPITAL

73 500 t eCO2



### PUBLIC ASSISTANCE - PARIS HOSPITALS

2021-2025 establishment project  
 → Evaluate carbon footprint of an Ambulatory Surgery Unit (USA)



### COCHIN USA

Opened in April 2018,  
 5 Operating theaters  
 8 surgical specialties  
 22 patients a day

## OBJECTIVE

IDENTIFY SPECIALTIES CARBON FOOTPRINT OF AN AMBULATORY SURGICAL UNIT

## METHODS

### ELABORATION AND COMPLETION OF DATA COLLECTION

EMISSIONS SOURCES (UNIT)	DATA SOURCE (YEAR : 2022)	FE (KG CO2/UNIT)	EMISSION FACTOR SOURCES
GASES (KG ECO2)	SAP*	NA	Données brutes des émissions de Sévoflurane
ENERGY - ELECTRICITY (MWH)		0,052	Empreinte Basis*, the French Agency for Ecological Transition (ADEME), expires in 2022
ENERGY - CPCIU + CTA (KWH)	Technical services	0,172	Empreinte Basis* ADEME, expires in 2020
WATER - CONSUMED (M³)		0,132	Empreinte Basis*, ADEME, expires in 12/2017
WATER - TREATMENT (M³)		0,262	Empreinte Basis*, ADEME, Expires in 12/2017
RSMD (REUSABLE STERILE MEDICAL DEVICE) - STERILISATION (UO)	T-Doc*	0,012	Carbon footprint, CSSD Cochin Hospital
RSMD (REUSABLE STERILE MEDICAL DEVICE) - PURCHASE (€)		0,315	The Shift Project (TSP) + NHS England carbon emission footprint
SUMD (STERILE SINGLE USE MEDICAL DEVICE) - PURCHASE (€)		0,315	TSP + NHS England Carbon emission footprint
SUPPLY - PURCHASE (€)	Business Intelligence SAP*	0,367	Empreinte Basis*, ADEME, Expires in 2018
DISINFECTANTS - PURCHASE (€)		1,166	
MEDICINES - PURCHASE (€)		0,5	TSP + NHS England Carbon emission footprint
EQUIPMENTS - INITIAL COST (€)		0,700	Empreinte Basis*, ADEME, Expires in 2018
EQUIPMENTS - MAINTENANCE (€)	SAP*	0,390	Empreinte Basis*, ADEME, Expires in 2018
WASTE (TONS) • DAOM PLASTIC • DAOM PAPER • REGULATED MEDICAL WASTE (RMW)	Data collection completed over 5 days in March 2023 by 2 young civic service volunteers, 1 extern and 1 pharmacy intern, which we extrapolated to one year.	363 47 934	Empreinte Basis*, ADEME, Expires in 2016
PATIENTS DEPLACEMENTS (KM)			RATP
USA PROFESSIONALS DEPLACEMENTS (KM)			RATP

### CLASSIFICATION OF EMISSIONS AS SPECIFIC AND COMMON

#### Specific emissions =

The purchase of SUMD that cost more than €700 per unit is assigned to a surgical speciality.

#### Common emissions -

All other sources of GHG emissions have been weighted according to the number of interventions in a surgical speciality

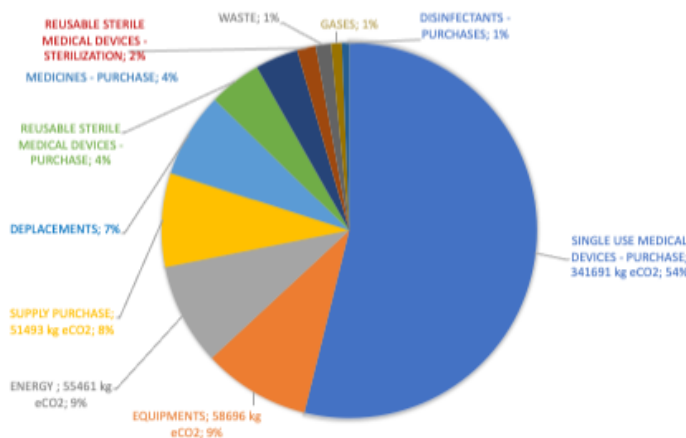
USA speciality carbon footprint =

Speciality Specific emissions + its part of common emissions

## RESULTS

### DATA ANALYSIS

IN 2022, THE ASU EMITTED 662 TONS OF ECO2



SUMD PURCHASES → 54% OF USA'S GHG EMISSIONS  
 RSMD → 6% OF USA'S GHG EMISSIONS

### CALCULATION OF ANNUAL EMISSIONS BY SURGICAL SPECIALTY IN THE ASU

SURGICAL SPECIALTY	PERCENTAGE OF INTERVENTIONS BY SPECIALITY (%)	COMMON GHG EMISSIONS (KG ECO2)	SUMDS SPECIFIC PURCHASES (€)	FE (KG ECO2/UNITÉ)	SPECIFIC EMISSIONS DUE TO SUMDS SPECIFIC PURCHASES	ASU SURGICAL SPECIALTY CARBON FOOTPRINT (KG ECO2)	EMISSIONS PER OPERATION BY SPECIALITY
UROLOGY	27%	152636	123656	0,315	38951,64	191587	122
DERMATOLOGY	16%	81000		0,315	0	81000	88
GYNAECOLOGY	24%	131662		0,315	0	131662	98
DIGESTIVE	11%	62603		0,315	0	62603	97
ORTHOPAEDIC	17%	95519	241735	0,315	76146,525	171665	177
PLASTIC SURGERY	5%	22913	2477	0,315	780,255	23694	88
Total		546332	367868		115878,42	662211	

ORTHOPAEDIC & UROLOGY SURGERY → SPECIALTIES WITH THE HIGHEST GHG EMISSIONS

## DISCUSSION

### THIS WORK HIGHLIGHTS :

- USA = 1,1% of Cochin Hospital GHG emissions
- SUMD purchases : most GHG emitting source
- Orthopedic surgery : most GHG emitting speciality

### SEVERAL SUSTAINABLE DEVELOPMENT INITIATIVES WERE ALREADY IMPLEMENTED IN THE ASU :

- Ecologically : Waste are distributed in paper or plastic garbage bins, sevoflurane is the only gas administered,
- Economically, hospital stays are shorter than those for conventional surgery,
- Socially, the unit offers patients a peaceful environment.

### ACTIONS LEVRS :

- Refine RSMD compositions with input from surgeons,
- Replace SUMD with RSMD whenever possible.