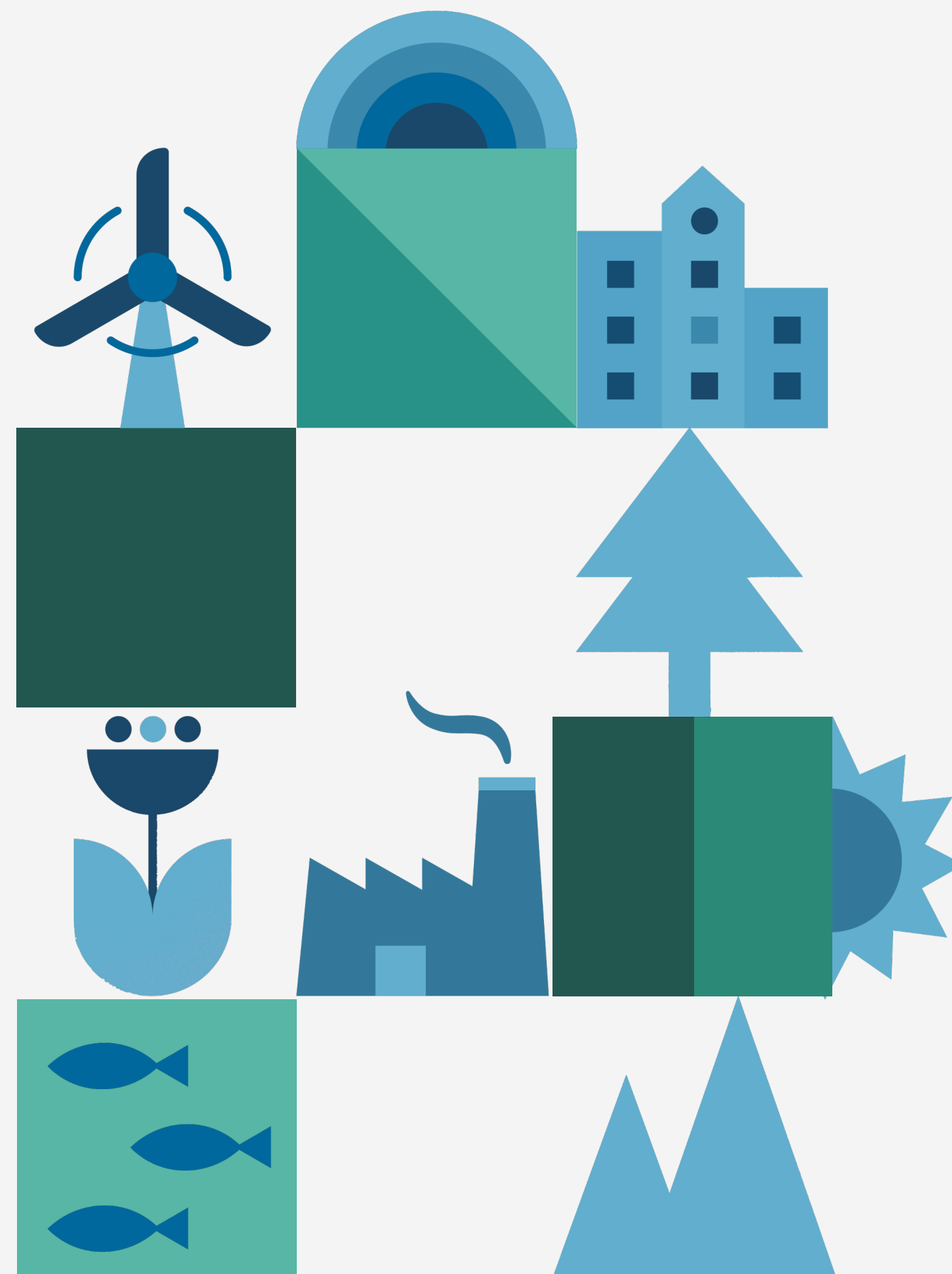
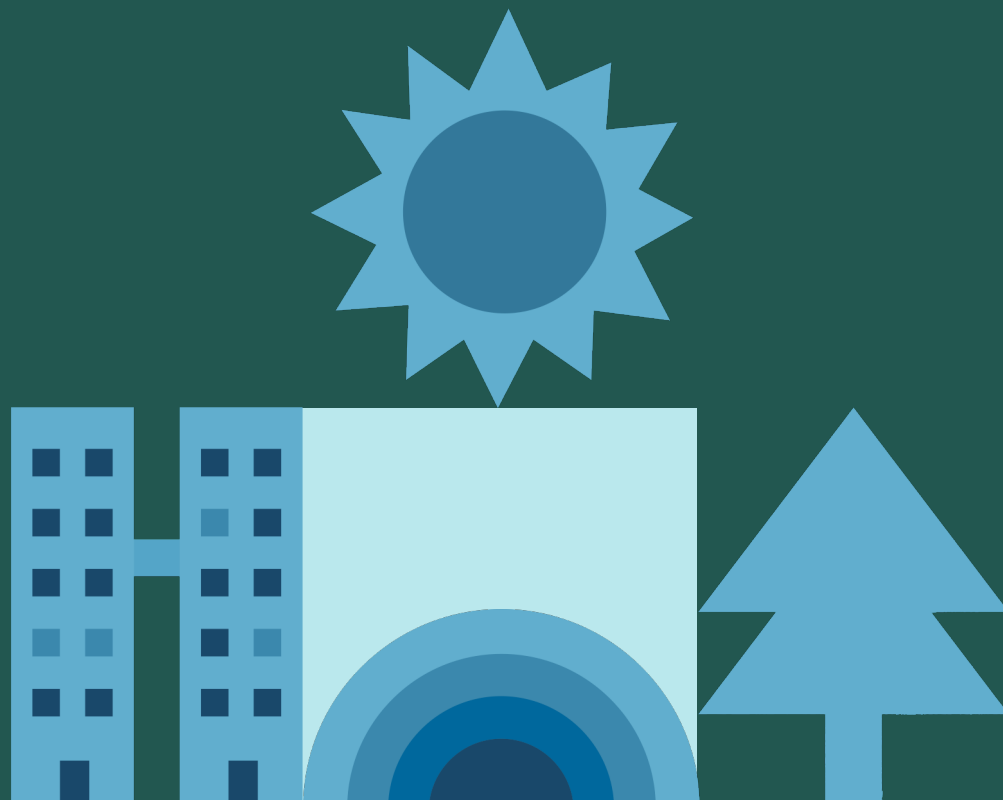


HOW TO REDUCE OUR CARBON FOOTPRINT in the OR, in the hospital, on the planet?

An ESAIC Tool-kit for beginners



Creating a task force in your institution



WHY

- Healthcare systems are major contributors to global carbon footprint
- OR is the main source of pollution of the hospital
- Of CO2e reduction targets set by governments and international treaties
- and this is a team building opportunity

HOW

- Talk, email, gather good will people
- Explain benefits: planet, hospital, patient, yourself
- Show this slide kit

WHO

- Nurses, Orderlies, Anaesthetists, Surgeons, Pharmacists, Hygiene, Administration
- Find the expert (engineer) in your hospital !
- Be a champion, be the leader!!

Basics

- All pollution types produced in hospitals are either released unchanged or incinerated at the cost of major CO₂ released to the atmosphere and join the greenhouse gases (GHGs), which are responsible for climate change.
- Climate change affects the social and environmental determinants of health. Between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year. The direct damage costs to health are estimated to be between USD 2-4 billion/year by 2030 (source WHO).
- Hospital waste = 1% of the nation's solid waste and 2.1% of annual GHGs emissions.
- 25% of OR waste is generated by anaesthesia.
- Anaesthetic gases on global warming: One year of international production of anaesthetic gases = one million cars.

The 5 R's

Reduce:

- Energy consumption: reduction of heating/AC or ventilation when unoccupied, switch to LED bulbs
- Water consumption: reduce flow in OR faucet
- Paper: suppression of anaesthesia printed report (only e file)
- Plastic: decrease single use and packaging
- Drugs and materials: Reduce overage
- Chemical and environmental exposures: BPA, Phtalates, endocrine disruptors etc...
- Other: Cups, coffee capsules, water bottles

Reuse:

- Reprocessing of medical devices

Recycle:

- Plastics
- Paper
- Medical glass
- Cartons and cardboards
- Metals such as stainless steel, aluminium, copper
- Batteries

Rethink:

- Remove unnecessary items, unused tools from surgical kits
- Walking patient to the OR
- Reinvest benefits into projects for patients and/or professionals
- Sustainable purchasing (life cycle analysis...etc...)
- Use telemedicine
- Reduction in hospital length of stay (fast-tracking, day case..)

Research:

- Life cycle analysis of medical devices
- Carbon footprint of new practices/technologies
- Comparison of carbon footprint of different health systems
- Development of « green » devices

Collective responsibilities (patients and professionals)

- Education of all healthcare professionals
- Sign an agreement as proof of commitment
- Reduce waste at each step of the perioperative process
- Communication within the local task force with the institution
- Improve patients' and professionals quality of life
- Team building
- Create a virtuous cycle (collect and reinvest)
- Break down barriers to the idea of sustainability
- Positive communication



Reduce inhaled anaesthetic atmospheric pollution

- All halogens gases are greenhouse gases
- Carefully choose your halogen gas
- Desflurane has by far the longest life span affecting the atmosphere
- Use N2O-free anaesthesia protocol
- Use low flow anaesthesia as a rule. Closed circuit!!
- Scavenging or oxidising the inhaled anaesthetics before vented to atmosphere is the future goal

0.9	1.9	5.4
CO2 kg/H equivalent	CO2 kg/H equivalent	CO2 kg/H equivalent
3	2	85
Cost per hour	Cost per hour	Cost per hour
£0.17	£2.51	£8.95
Equivalent car travel per hour	Equivalent car travel per hour	Equivalent car travel per hour
20 km	11 km	531 km
Isoflurane	Sevoflurane	Desflurane

Reduce and sorting out waste

Define different kind of waste (domestic, clinical, hazardous, pharmaceutical)

Waste bins:

- Define different kinds of waste (domestic, clinical, hazardous, pharmaceutical)
- Sort out the waste (most waste is domestic!)
- Reorganize the waste containers in the OR to favour the use of domestic waste/recycle bins
- Post clear graphics to help sort out the waste
- Learn about the waste chain in your hospital
- Make choices depending on your environment/waste chain
- Visit your waste disposable facility/incineration plant

Reduce wasted (opened and unused) disposable supplies:

- Redesign pre-packaged supply kits
- Think before you open
- Refuse new disposable devices

Reduce paper waste:

- Do not print

Drug waste:

- Reduce drug wastage: prepare drugs when needed, favour smaller drug bottles (i.e 20 ml instead of 50 ml)
- Do not spill drugs in the sink

Recycle

STEP ONE – GET information

- Local regulations. Do you already have a program for recycling ?

STEP TWO – MEASURE

- Obtain some numbers about predicted amount of recyclable materials and monetary benefit for hospital.

STEP THREE – FIND ALLIES

- Find the persons in your hospital that will help you (lead nurses, residents, administration, engineering...)

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- Think of the way to motivate them
 - Find local recycling company to help you
 - Make contact with your local non-profit organization involved in environment, recycling.
 - Make contact with local governmental organizations
 - Plastics: Need to be not mixed with other type of waste
 - Paper: confidential information can be recycled through specific secure pathways
 - Medical glass can be recycled if treated by specialized companies (but not in the household glass sector).
 - Cartons and cardboards
 - Metals such as stainless steel, aluminium, copper
 - Batteries, ink cartridges



Anaesthesiologist's responsibilities

Drugs:

- Reduce drug wastage : 7 to 94% of the loaded drugs are waste
- Use pre-filled syringes when possible
- Do not spill drugs in the sink

Devices:

- Reduce wasted (opened and unused) disposable supplies
- Pre-condition the purchase of disposable OR equipment in the collection and recycling of the used material
- Choose devices depending on their life cycle
- Favour reusable devices
- Refuse devices with batteries
- Make sure plastic devices / wraps do not contain phtalates

Do not print the anaesthesia report

Energy: Turn off

- Lights
- Computers and all electronic devices
- Respirators and all electric devices
- OR lights
- Ventilation, the temperature in the OR set at an optimal
- level allowing decontamination and safety

Personal behaviour

Food/beverages:

- Use a reusable mug for coffee / tea
- Refuse plastic silverware and dishes at work
- Promote organic and local food in reusable dishes
- Eliminate plastic bottles
- Reusable and washable glasses for patients and yourself

Be e-green:

- Promote green-transportation for meetings (train, not plane)
- More audio-video conferences
- Stop emails to all (0.21g of CO₂ /email)

When attending a national or international conference:

- Refuse flyers and plastic goodies
- Refuse single-use badge holders

Transportation:

- Consider commuting with a low emission transportation mode (train, bike, feet..etc)



Agenda with partners

- Assess the ecological cost of decontamination processes with hygiene services (vs single-use).
- Meet with pharmacists about the life cycle of single-use devices.
- Meet with the administration for a payback from recycling services intended to improve the quality of care or life at work, discuss food/beverages, and merge with already existing institutional programs.
- Meet with technical services about existing recycling processes and waste chains already implemented in the hospital.
- Meet with companies about reprocessing opportunities and/ or life cycle of their medical devices.

