

Executive Bundle on how to reduce the carbon footprint in anaesthesiology and intensive care

CARBON FOOTPRINT

Scope 1

Direct Emission

Scope 2

Energy use optimisation

Scope 3

Waste management and
supply chain

Scope of recommendations



Direct Emission

- **Choose TIVA or Regional Anaesthesia** when possible
- **Choose the inhaled agent with the lowest Global Warming Potential** available (sevoflurane < isoflurane < desflurane)
- **Desflurane should be avoided** and only used when strictly clinically indicated, and when there is not a valid alternative available
- **Nitrous oxide** should only be used when other alternatives are not available
- All halogenated drugs should be used at the **lowest possible** fresh gas flow (FGF) during **induction** and **steady phase** of anaesthesia
- Aim at **minimal FGF (< 0.5 lpm)**, whenever safe and technically feasible during steady phase
- Although still under-studied, the use of **Vapor Capture Technology** together with **minimal FGF** in an **Air-Oxygen mix** might have a significant positive impact in your carbon footprint
- Anaesthetic drug requirements should be tailored according to **depth of anaesthesia (pEEG) monitoring** to avoid unnecessary gas or propofol consumption

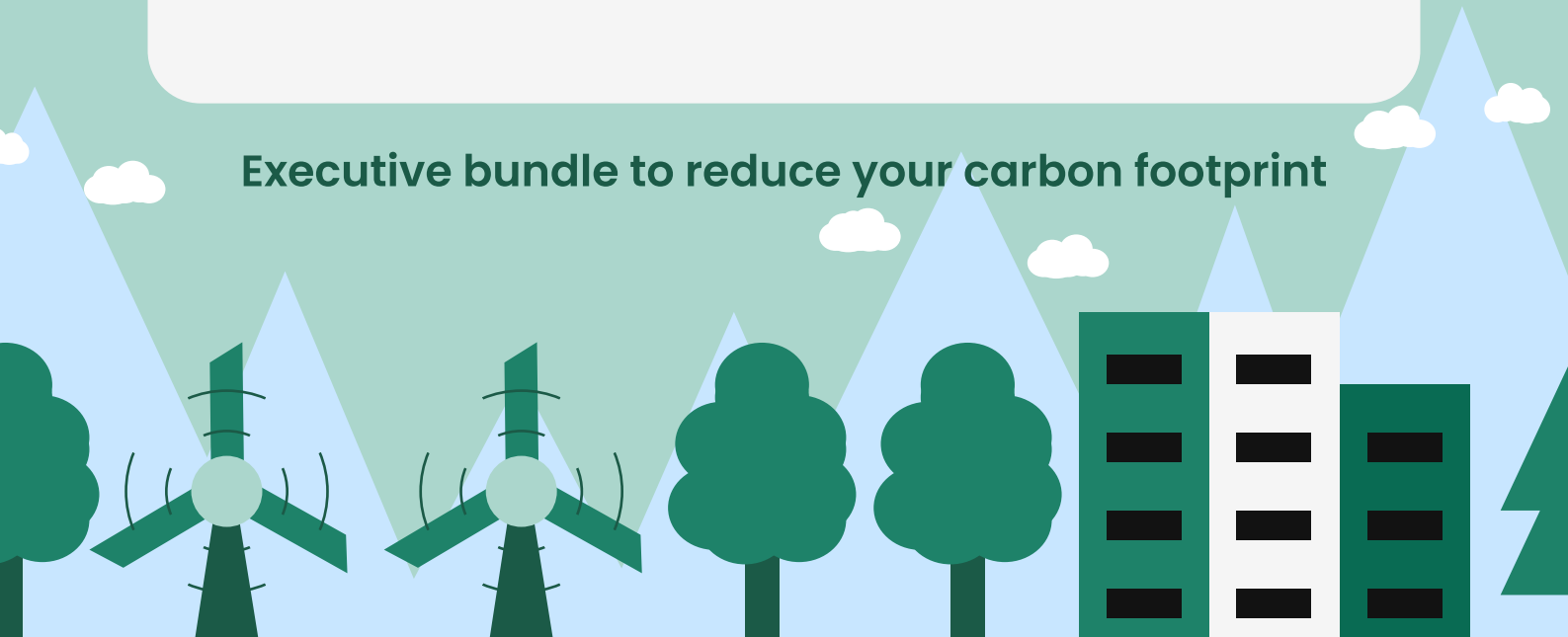
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Energy use optimisation

- Set **OR temperature goal within a 18–22 °C** range, provided that hypothermia prevention measures (eg warming blankets, warming fluid devices) and monitoring are in place. **Newborns are excluded** from this recommendation
- **Burn Unit Operating theatre** optimum temperature range is 24°C to 30°C
- OR **relative humidity** should be maintained between 30% and 60% at all times
- **Theatre doors** and **hospital windows** should be kept **closed** at all times to reduce temperature loss
- **Scavenging systems** should be turned off at night and during weekends, except in designated ORs for emergent surgical procedures
- **Switch off** computers and Wi-Fi network during off-hours. Last person to leave the OR must turn off lights and computers that still remain operative
- Label equipment that can be **turned off safely after use**
- Please dispose **batteries** properly
- **Surgical hand rubbing** is preferred over surgical hand scrubbing
- **Close water tap** when it is not in use

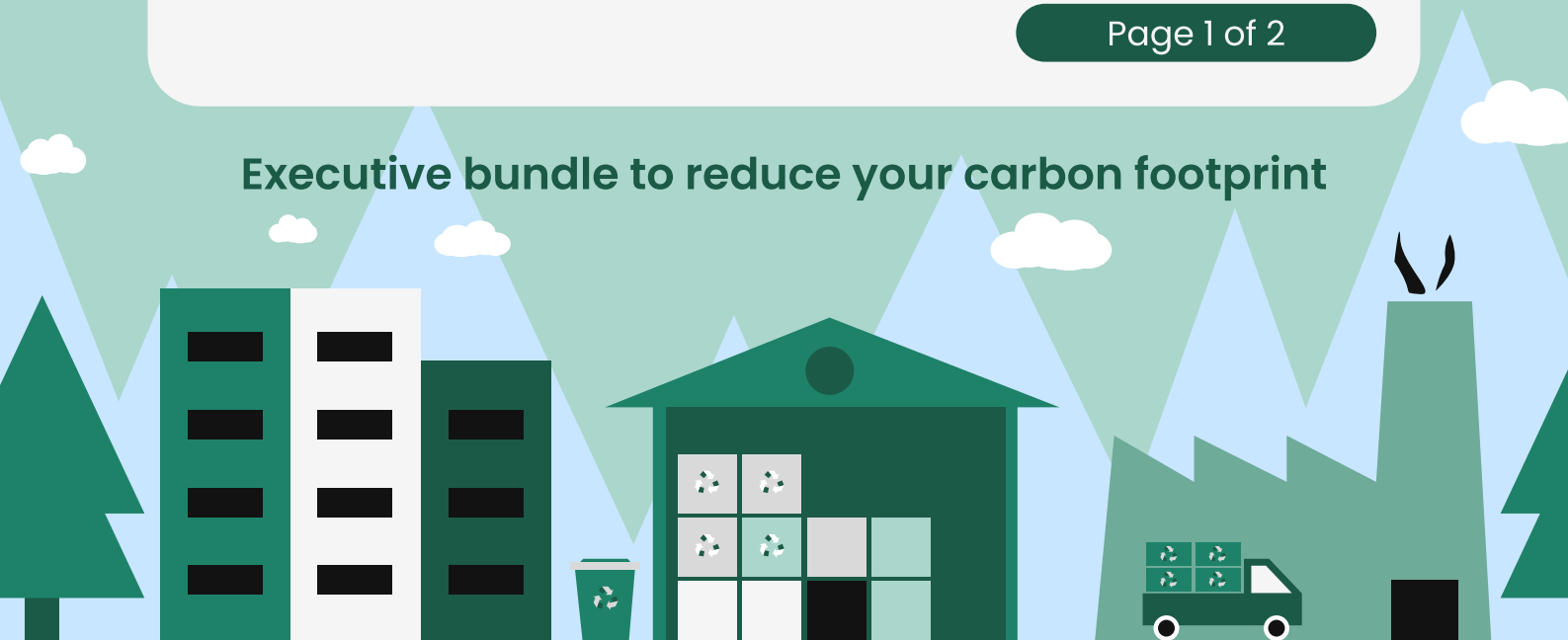
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Waste management and supply chain

- **Avoid single use devices** that do not provide a clear benefit in patient care
- Document overage actively and use these items first in order to reduce waste
- Ask Industry providers for **energy efficiency labels** for new electronic devices according to the European A-G scale
- Ask for **PP or silicone** reusable devices over PVC / DEHP
- **Think twice** before opening a sterile package, supply kit or any other product
- In a case where multiple ampoules of saline are required to dilute medication, consider the use of an **appropriate size of saline bags** (50 or 100 ml)
- Use **reusable** equipment and materials instead of disposables ones
- **Appropriate waste segregation** is crucial for reducing clinical waste and achieving a higher proportion of recycled waste
- Waste from **plastic suction bottles** can be reduced by reusing the containers and lining them with disposable liner

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Waste management and supply chain

- Empty drug ampoules or crystalloid fluid solutions bags are **not bio-hazardous**
- They can follow standard glass / plastic recycling protocols
- **Limit** the preparation of **drugs** to be used “in case of emergency
- Use **prefilled** syringes when feasible (eg atropine, ephedrine, adrenaline)
- **Reduce propofol waste** by using 20 mL propofol ampoules. Reserve the 50- and 100-mL bottles for TIVA/TCI syringes. Avoid leftovers and **remember to discard propofol in a designated area** (usually the sharps bin), not in the sink!
- **Separate and recycle** uncontaminated paper/cardboard, medical plastic and metal to certified sustainable recycling companies
- Be sensible for **high recycling potential materials**. Non-woven polypropylene (PP) wrapping paper or halogen gas aluminum bottles have a high recycling potential
- Recycle or appropriately **dispose electronic equipment** and batteries to certified sustainable recycling companies

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