Reusable versus Single-use Anaesthetic Equipment
Life Cycle Cost and Environmental Savings

Financial and environmental costs of reusable and single-use anaesthetic equipment.

Life Cycle Assessment is an internationally, standardized, science based approach to quantify multiple environmental and public health impacts of a product and/or process over its entire life span, from raw material extraction, device production, transport, use and reuse, reprocessing and disposal. Life Cycle Assessment should support procurement in decision making on the real costs and environmental burden of a product.

This study aims to assess in two Australian hospitals with 6 operating rooms (OR) real costs from changing from reusable to disposable anaesthetic equipment, including various different multi-use vs single-use anaesthetic equipment combinations scenarios.

Significant life cycle and environmental savings of re-usable vs. mainly single-use anaesthetic equipment.

- **Environmental Savings:**
  - Greenhouse Gas Emissions (GHG) measured in CO2 equivalents
  - Depends on energy source, up to 50% (US) p.a. or similar in Australia due to mainly coal sourced energy used

- **Annual Operating Cost Savings:**
  - All multi-use vs. mainly single-use in 2015 with 6 operating rooms
  - ~85% p.a.
  - ~46% p.a.
  - $32,033 AU$

“In all five scenarios the financial cost to process single-use anaesthetic equipment was more than for reusable anaesthetic equipment.”

Important quotes:
> “If all UK hospitals had single use anaesthetics and would convert to reusables this would be the equivalent of taking >1000 cars off UK roads.”
> “Given that reusable direct laryngoscope blades could be washed with surgical equipment in surgical-type washer loads, the consequences of replacing them with single-use variants would not lead to any measureable reduction in the number of washer loads required”.
> “We did not include washer and sterilizer maintenance and depreciation as these are fixed annual costs. These costs would be unaltered by the presence or absence of reusable anaesthetic equipment, owing to the much larger number of surgical items that would require cleaning regardless”.
> “Labour costs to process all reusable equipment were modest. Most environmental impacts to process anaesthetic equipment were small, with only CO2 emissions and water use being relatively important”.

*Scenario 1: All Multi-use (MU) anaesthetic circuits / face masks and Laryngeal mask airways (LMA), direct and videolaryngoscope blades and handles,
Scenario 2: Mainly Single Use (SU) anaesthetic circuits / face masks / LMA / Blades, but MU handles & videolaryngoscopes, Scenario 3 All SU (Model),