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Wales

PHW Microbiology Single-use Plastic Project – Annex L – Case Studies

As part of the final project report, Revolution-ZERO introduced four case studies on assessing and reducing single-use plastic. These have been sectioned into separate pages to be shared individually.

To support understanding of the impact of emissions and better communication, a table of CO₂e in real-life situations has been included.

Emissions Equivalents

Activity	CO ₂ e
Hour of using an average-efficient laptop	10 g ¹
Laundry load washed at 40C, tumble dried	2 kg ¹
Dry powder inhaler (estimated 200 doses)	4 kg ²
5-watt low energy bulb for one year	15 kg ¹
London to Glasgow and back (train)	64 kg ¹
Using a smartphone (a year's typical usage of 195 minutes a day)	69 kg ¹
London to Glasgow and back (small efficient petrol car)	237 kg ¹
Metered dose inhaler (estimated 200 doses)	100 kg ²
Insulating a loft (outlay for a detached house)	400 kg ¹
Hip replacement or knee surgery	1 tonne ¹
Heart bypass operation	2.3 tonnes ¹
A new build house (three-bedroom terrace, bricks and mortar)	32 tonnes ¹
Installation of a 100-kW wind turbine (saves 2619 tonnes after 20 years)	134 tonnes ¹

¹ Berners-Lee, M 2010, *How Bad Are Bananas?*

² <https://www.nice.org.uk/news/article/nice-encourages-use-of-greener-asthma-inhalers>



Case Study 4: Recycle, Pipette Tips

The final case study relates to one of the largest procurement derived sources of waste for NHS Wales, which is pipette tips made from polypropylene. Key issues with pipette tips relate to contamination of the material during use, and hence decontamination if they need to be reprocessed.

There are, however, emerging innovators within the UK, such as LabCycle and Automedi, who were interviewed during this process. LabCycle, in particular, has a laboratory focussed solution **where they can process and decontaminate pipettes, reducing them back to the raw material ready for remanufacture into pipettes**. This provides a unique opportunity to go from like-to-like products, which is a more efficient use of recycling than changing product outputs.

The timeline for being ready for deployment across Wales has been estimated to be 2024 according to the manufacturer, LabCycle. **We recommend ongoing horizon scanning in this space given the waste prevention opportunity this can provide**. Revolution-ZERO has estimated the reduction in emissions from mechanical recycling of pipette tips. As the product quantities are hard to accurately record in procurement data, the quantities, emissions and emissions savings are likely to be higher.

Emissions savings from recycling pipette tips

Product	Quantity	Total Weight (kg)	Total CO ₂ e (kg)	CO ₂ e reduction from recycling (kg)
Pipette Tips	3,478,392	8696	44,217	24,349