

Collaborative research project seeking research partners and support for innovation and sustainability design.

negowaste[©]

*methodology
to measure the
positive value of
not producing
waste.*

In order to demonstrate the positive value of not producing waste, there is a need to collect financial and eco-costs data in both packaging pre-consumption and post-consumption phase.

The negowaste © calculator is based on a comprehensive database of packaging types classified and benchmarked by categories of products that use/need packaging to be delivered and/or consumed.

Pre-consumption phase

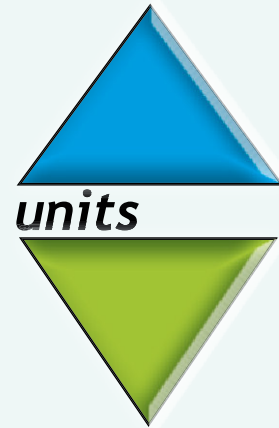
An initial review was carried out to identify the eco and financial cost involved within the packaging life-cycle.

The 'value' of packaging in the pre-consumption phase is determined by the value paid by the brand owner/retailer that purchases the packaging solution for their product, and this data refers to: type and quantity of materials (weight or volume), process costs and eventually transport and storage costs (depending on the type of packaging), where the eco-costs are to be measured in terms of scarcity of materials, relative distance in sourcing raw materials, and energy consumption or power consumption, water consumption and pollution, air pollution and soil degradation generated by packaging production.

The unit of **pre-consumption** can be found in the packaging manufacturers' quotes, industry reports and environmental or sustainability reports based on:

- **weight based data**: quantity of material and what materials are needed
- the associated **manufacturing costs** = process + labour + energy
- the **distribution cost** = volume/distance to destination to pre-pack product

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Post-consumption phase

Packaging only becomes waste at the post-consumption phase, and this is where we will find the value of no waste, by measuring the costs (financial and ecological) of the waste generated by packaging. The goal of no waste commitment depends on the design decisions defined by the brand owner/retailer or packaging manufacturer, which prevented packaging to become waste, by designing solutions that include re-use, refill, repair, or where there will be no material waste (such as edible or dissolved).

This is said to be at **level 1** of Negowaste © framework.

At this level, costs of waste are prevented and waste management and disposal costs do not occur.

At **level 2**, the problem of waste production is managed and monitored by the brand or retailers and a closed loop system is designed to take back the materials, reprocess and sale to the market.

At **level 3**, the relevant costs are passed to the filled, incinerated and /or recycled are very common solution used by most nations. This situation is changing and with the urgency to find alternatives before the saturation of landfill sites by 2015.

Unit of Post-consumption can be calculated by the volume or weight of material that will have to be collected, transported, segregated, and reprocessed (recycled, remanufactured, recovered, composted) to generate cost combinations of:

- volume or weight/material + designed to be recycled,
- volume or weight/material + designed to be remanufactured, taxpayer in dealing with the waste problems.

At level 2 and 3, there are various disposal options in dealing with the amount of waste generated (e.g. recycling, compost, incineration, waste to energy, landfilling route).

Landfilled, incinerated and /or recycled are very common solution used by most nations.

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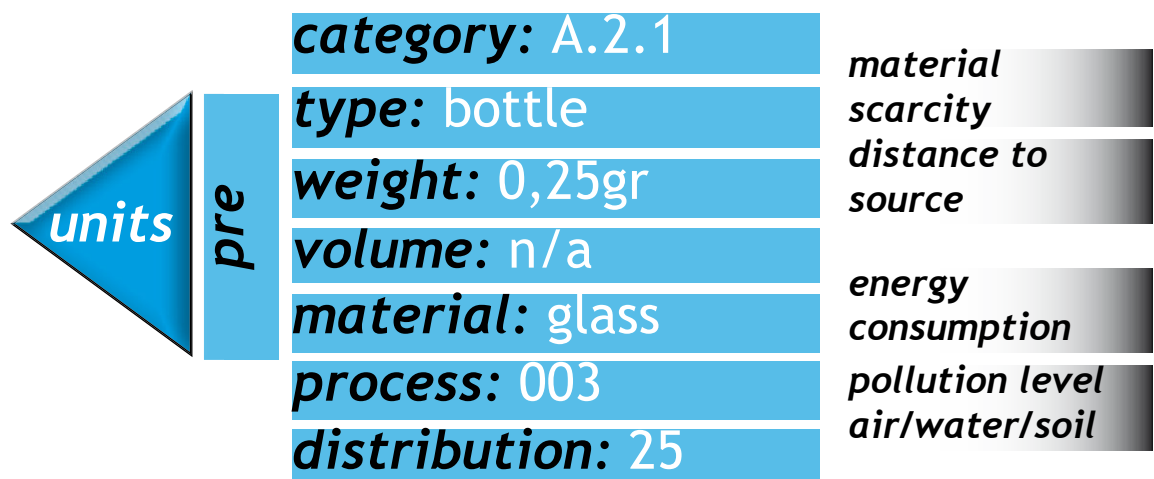
- volume or weight/material + designed to be recycled,
- volume or weight/material + designed to be remanufactured,
- volume or weight/material + designed to be burnt,
- volume or weight/material + designed to be compostable,
- volume or weight/material + designed to be reused industrially
- volume or weight/material + designed to be reused by the user
- volume or weight/material + designed to be refilled
- volume or weight/material + designed to be remanufactured
- volume or weight/material + designed to be repaired
- solution designed to not become waste (edible, nonmaterial, reversed, repurposed, etc)

The full financial cost from waste collection, segregation, recycling, and recovery will be calculated to include all the waste contractor fees, landfill tax, labour cost, equipment and material consumption and potential adding costs and deducting gains from recycling. The research process includes collect and analyse official published data, technical literature, industry reports, published studies, and personal contact with industries are all important sources of data. The selection of the source of data includes complete documentation of sources, assumptions, limitations and omissions.

Waste disposal and landfill costs can be gathered from contractor's invoices, 'pay by weight' contracts waste transfer notes and waste audits, which may also contain data on bin container rental/day, electricity usage in running compacting and other equipment, lift cost, transport cost to disposal sites (charged per kilometre), weight of waste moved and disposal cost per tonne in the general waste stream.

Data on waste stream to be gathered in numerous ways (although generally achieved by volume-weight conversions). Pay-by-weight systems that provide actual weight of waste removed from residences and waste contractor weighbridge waste figures. In many cases, however, costs and quantities of packaging will have to be estimated according to the quantity of general waste. Calculating the estimated weights is possible by using the conversion formulas. The standard conversion factor for general waste from industry is 40 kilograms per cubic metre This tool builds up a picture of packaging waste and no-waste creating activities - and to see more clearly where it is wasting or preventing waste resources. It also identifies areas of environmental impact where improvements can be made, such as: environmental improvement of existing packaging systems and reduction in the environmental impact of packaging systems at the design stage. The positive parameter of Negowaste indicates the true value of waste prevention and its benefits to UK businesses. The negative parameter of Negowaste indicates the extent of costs involved in managing waste, benchmarked against alternative solutions for the same purpose.

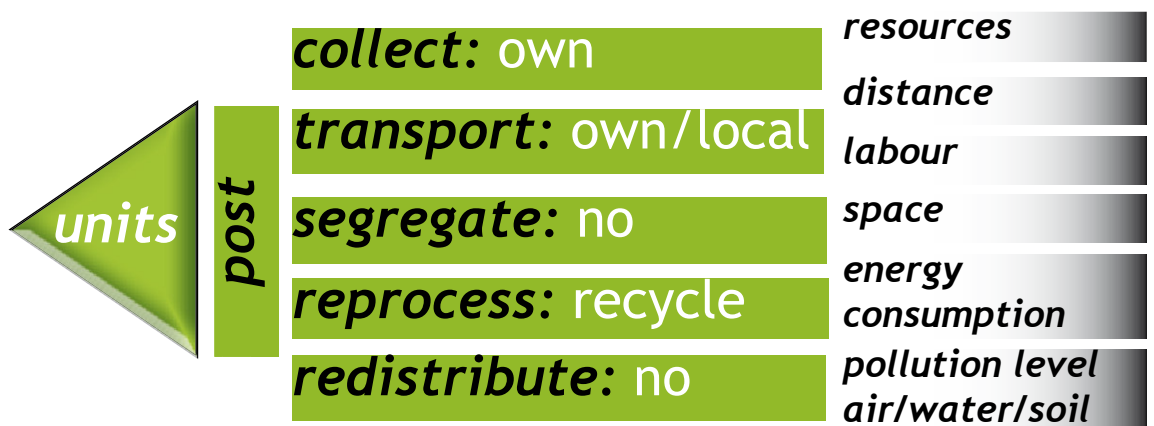
The calculator will automatically generate three figures to inform and benchmark the positive and negative value of waste:



negowaste®
points



The Negowaste © calculator is designed to be real-time updated, in which a new record becomes the best in class and updates the benchmarking certification.



what is the value of this tool?

The major driver for business innovation is profit measured in ROI. The critical barrier for eco-innovation strategies, is the ability to demonstrate how such investments translate in business performance, in particular it's impact on the bottom line.

the calculator's primary use for business:

a KPI tool to measure and monitor the intangible value of **not producing waste**, and convert it into financial value.

it is also a benchmark tool to inform and support eco-design and innovation decisions.

the calculator's value for policy makers and regulators :

as a calculator that converts the positive value of waste prevention in financial value, this is a strategic tool to support innovation investments in waste prevention, monitor and benchmark business best practice.

the value of the calculator for a sharp tax system:

Current strategies to support sustainable development and shift behaviour (corporate and citizens) are considering a new generation of green taxes, the **negowaste®** calculator will allow to design and implement a sharp tax system convert the positive (financial and ecological) value of **not producing waste** solutions, into financial gains, which can be incorporated into a consumption tax, such as the VAT, rewarding corporate and consumer's waste prevention choices.

Proposed Project Timeline

Phase 1: Development of the **negowaste®** calculator to quantify waste prevention benefits

Phase 2: Pilot Studies of **negowaste®** as a tool for the assessment of no waste benefits

Phase 3: Setting performance standards as a first step towards development of the **negowaste®** label

Phase 4: design development of a sharp tax system

For further details and information see contact details below.



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Negowaste® is a concept developed by **Maria Ana Neves, Joyce Tsoi** and in collaboration with other independent researchers. We expect the viewer of the present document to respect authorship and terms of confidentiality and non-disclosure of the ideas and information shared in documents, meetings, electronic and phone conversation. we are also interested in feedback and critical reviews to improve and iterate our thinking and progress.