

Showerex CO₂ Calculations

Operational Savings

The online calculator computes an estimate of the annual CO₂ savings from using a Showerex. From the calculator page: “CO₂ saved is calculated based on the average CO₂ emissions per kWh of electricity generated in New Zealand (0.1287 kg per kWh) as reported by the New Zealand Government's EECA Business CO₂ Emission Calculator on 8th May 2019”.

A typical shower drain system is the baseline and therefore saves 0 kg of CO₂ every 12 months.

Using the default settings of the online calculator, a Showerex 1400 saves an estimated 257 kg of CO₂ every 12 months (and that is in New Zealand conditions, overseas, the savings are much higher due to the higher proportion of coal / oil used in electricity generation).

Furthermore, the operational savings may significantly underestimate the CO₂ reduction provided by Showerex. The calculations are based on average CO₂ emissions, but showers are frequently used during peak hours for electricity generation, which is when CO₂ emissions are at their maximum.

Embodied CO₂ Emissions

The “Embodied Energy and CO₂ Coefficients for NZ Building Materials” report issued in March 2003 from the Centre for Building Performance Research at Victoria University of Wellington provides the following New Zealand data:

PVC, extruded – 4,349 g CO₂ / kg
Copper, virgin, sheet – 7,738 g CO₂ / kg
Copper, virgin, rod, wire – 7,477 g CO₂ / kg
Copper, recycled, tube – 112 g CO₂ / kg

While “The Inventory of Carbon and Energy (ICE)” from Carbon Trust and University of Bath provides the following European data:

PVC pipe – 2,560 g CO₂ / kg
Copper, virgin, tube and sheet – 3,650 g CO₂ / kg
Copper, recycled, tube and sheet – 800 g CO₂ / kg



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These types of calculations are always fraught with difficulty, as the emissions involved can vary dramatically depending on the supply chain. For example, the data shows the CO₂ impact can be dramatically reduced by using recycled copper tube.

The postage pack for the larger Showerex 1400 weighs 5.3 kg, assuming all the weight is copper and that the embodied CO₂ of the raw copper pipe is even worse than indicated by the data (10,000 g CO₂ / kg), the estimated embodied emissions is 53 kg of CO₂ for the raw copper pipe used in manufacturing a Showerex 1400.

Based on raw data provided by Vaportec of the energy required during the manufacturing process that turns the copper pipe into a completed Showerex, and an average of 0.1287 kg of CO₂ per kWh, the estimated embodied emissions are 3.2 g of CO₂ for the manufacturing process of a Showerex 1400.

Even assuming there were zero CO₂ emissions embodied by the PVC pipe used in a typical drainage system, the 53.0032 kg embodied by a Showerex 1400 is quickly recovered by the energy saved by using a Showerex 1400. Specifically, the embodied CO₂ is recouped within approximately 2½ months of typical use, after which point the Showerex 1400 saves an estimated 257 kg of CO₂ every 12 months.

Kind Regards,

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