

Source: [http://www.treehugger.com/files/2007/02/pablo\\_calculate.php](http://www.treehugger.com/files/2007/02/pablo_calculate.php) 2.6.07

## **Pablo Calculates the True Cost of Bottled Water** by Lloyd Alter, Toronto on 02. 6.07 Science & Technology

We have tried to calculate the true cost of producing and transporting bottled water before, and have come up with just vague approximations, which did not take the production of the bottle into account. Over at Triple Pundit, Sustainability Engineer and MBA Pablo Paster has done a thorough and exhaustive study of the cost of bring a litre of Fiji Water to America. He starts with the production of the bottle in China, taking the bottle blanks to Fiji, and confirming that it takes more water to make the bottle than it actually holds. He then transports the bottle to the States by ship. Not even including the distribution in the States, **the numbers are absolutely staggering.**

In summary, the manufacture and transport of that one kilogram bottle of Fiji water consumed 26.88 kilograms of water (7.1 gallons) .849 Kilograms of fossil fuel (one litre or .26 gal) and emitted 562 grams of Greenhouse Gases (1.2 pounds).

Twenty-six times as much water used to make it than you actually drink. As much fuel to make it as there is water in the bottle. Staggering is an understatement. Click here for original source at [::Triple Pundit <http://www.triplepundit.com/pages/askpablo-exotic-bottled-water-002401.php>](http://www.triplepundit.com/pages/askpablo-exotic-bottled-water-002401.php)

Here is a portion of the original:

I doubt that Fiji has a booming plastics industry so they probably get the bottles from China. I would suspect that they get the bottles in the form of "Blanks" which are then expanded to their final size and shaped by a process called "stretch blow molding." The total mass of the empty 1 liter bottle is probably around 0.125kg (125g) and it is probably made from PETE or HDPE (Sorry, I'm not running out to the store to check). Plastics of this type typically use around 6kg of oil per kg, 200kg of water per kg, and result in around 3kg of greenhouse gas emissions per kg. So, with a quick check ( $200\text{kg/kg} \times 0.125\text{kg} = 25\text{kg}$  of water) we find that Butterfly is indeed correct. Based on my assumptions a bottle that holds 1 liter requires 25 liters of water in its manufacturing process (this includes power plant cooling water).

Let's take a look at the transportation aspect to see what the total ecological impact of an exotic bottle of water might be. A container vessel uses 9g of fuel per tkm (that's metric tons carried x distance traveled), 80g of water per tkm, and releases 17g of GHGs per tkm. The distance from China to Fiji is 8,000km, which gives us exactly 1tkm ( $(0.125\text{kg} / 1\text{t}/1000\text{kg}) \times 8,000\text{km} = 1.0\text{tkm}$ ). So, 9g of fossil fuels, 80g of water, and 17g of GHGs per bottle delivered to Fiji from China.

Now let's look at the trip to the US. The distance from Fiji to San Francisco is 8,700km. But this time the bottles will be full, so they will have a mass of 1.125kg each. This gives us a much larger value of 9.8tkm ( $(1.125\text{kg} / 1\text{t}/1000\text{kg}) \times 8,700\text{km} = 9.8\text{tkm}$ ) which I will round up to 10tkm. So, 90g of fossil fuels, 800g of water, and 170g of GHGs per bottle delivered to the US from Fiji.

Since the fossil fuels end up being accounted for in the GHG emissions I'll ignore those values for now. The total amount of water used to produce and deliver one bottle of exotic water is 26.88kg (25kg + 80g + 1kg + 800g)! And the amount of GHGs released amount to 562g (375g + 17g + 170g), or 0.562kg, or 0.000562 tons. If you wanted to offset your annual exotic water habit (are you eco-chic Hollywood types listening?) with DriveNeutral it would cost you \$1.54 (0.000562 tons/day x 365 days/year x \$7.50/ton), just 4 cents more than the cost of one bottle of water.