#### **Press release**

**Energy balance of glass bottles**

**The heavy and costly burden**

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| **Producing glass requires a great deal of energy and is therefore particularly affected by high procurement prices. In 2022, the Federal Association of the Glass Industry reported a fivefold increase in costs. The beverage industry is expected to pass these price hikes on to consumers. A good alternative: PET bottles – in more ways than one.**  **Fired up 24/7: glass likes it hot**  Glass production is hotter than a volcano. Raw materials like sand, lime, and soda must be heated to 1,600 degrees Celsius to melt. Even when using 65% recycled glass shards, it still requires 1,400 degrees Celsius. To maintain these temperatures, furnaces must run continuously on gas or oil – any pause could destroy them. This energy requirement is costly, especially now, with soaring energy prices, despite government-imposed price caps.  According to the German Environment Agency, glass production is among the most energy-intensive industries, with high demands for energy and significant emissions of CO2, nitrogen oxide, sulfur dioxide, and particulate matter.  The Federal Ministry for Economic Affairs and Climate Action reported in its 2020 “Glass Industry Profile” that in 2015 the glass industry required 51.93 petajoules (about 14,436 gigawatt-hours) of energy just for the melting process. For comparison: a typical 6 MW wind turbine produces around 10 gigawatt-hours per year – enough for approximately 3,500 households[[1]](#footnote-1). To meet the glass industry's 2015 energy needs, 1,443 wind turbines would be required – equivalent to powering over 5 million households annually.  The same year, the glass industry emitted 4.881 million tons of CO₂[[2]](#footnote-2). As such, the German Environment Agency notes, glass production can never be truly sustainable. However, there are alternatives for container glass used in beverage packaging that consume less energy and are more climate-friendly – chief among them: PET plastic bottles.  **Reusable or disposable: which is more eco-friendly?**  Glass and PET bottles share similarities: both are made from raw materials – sand for glass, petroleum for PET. However, PET bottles require only around 265 degrees Celsius to manufacture – more than 83% less heat than glass.  Both materials are used for reusable and disposable bottles and can be similarly well recycled. For reusable bottles, the German Environment Agency finds no major difference between glass and PET[[3]](#footnote-3). Glass bottles can be refilled up to 50 times, PET about half that. This reuse offsets raw material use and enhances sustainability. Producing new bottles consumes more energy and resources than transporting and cleaning reusables.  But this view is contested. “Environmental assessments reveal: the Achilles’ heel of reusable bottles is transportation logistics,” notes Dr. Isabell Schmidt from the German Plastic Packaging Industry Association.  A further challenge to the glass bottle reuse system is the use of individual (non–standardized) bottles for branding purposes, which can’t be reused by other fillers. These foreign bottles – up to 50% of returns – must be sorted out and returned to the original producer, incurring additional transport costs and ecological disadvantages.  **Weighty matter: why logistics matters**  Transport is a major factor in the energy and emissions balance of packaging, especially glass. The greater the distance between producer, filler, and retailer, the higher the impact – especially considering the weight. A 1–liter PET bottle weighs about 28 grams, a 1-liter glass bottle about 550 grams – nearly 20 times more. One metric ton equals 1,800 glass bottles or 35,000 PET bottles. The heavier the packaging, the more energy–intensive the logistics.  This becomes even more apparent when returning deposit bottles from retailers to recyclers. The Alliance for Future Beverage Packaging (BGVZ) calculated that 400,000 compressed PET bottles require one truckload, while 400,000 glass bottles need 26 truckloads.  The “Glass Industry Outlook 2030+” from the IG BCE’s Foundation for Labour and Environment outlines opportunities and risks. Challenges include energy–intensive production and the difficulty in transitioning to lower-emission technologies[[4]](#footnote-4). The industry fears ongoing high energy costs and stricter environmental regulations. Recent data confirms this: the Federal Statistical Office reported that in early 2023, producer prices for colorless glass bottles rose by 40.2% compared to January 2022, and colored glass bottles by 37%. Rising energy prices and increased raw material costs – 58.5% for soda, 30.4% for quartz sand, and 27.3% for limestone[[5]](#footnote-5) – are the culprits. The glass industry also anticipates stronger competition from alternative materials like PET bottles. | **Contact**  Claudia Wörner  yes or no Media GmbH  Vor dem Lauch 4  70567 Stuttgart  Germany  [www.yes-or-no.de](http://www.yes-or-no.de)  Phone: + 49 711 7585 8900  presse@yes-or-no.de  Characters: 5.025 |

**Image**

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*Hotter than a volcano – this is how glass is produced.*

*Raw materials like sand, lime, and soda need up to 1,600 degrees Celsius to melt. (ALPLA, own image)*

**About "Plastic is fantastic"**

“Plastic is fantastic “refers to the relationship between humans and one of the most elementary building blocks of civilization: plastic. With factual contributions, the initiative aims to achieve the appreciation that is appropriate for the versatile material.

ALPLA, the Austrian specialist for plastic packaging, has launched "Plastic is fantastic" - because the company believes in this recyclable material. ALPLA is now in its third generation of commitment to sustainable recycling solutions and is also a pioneer in the development of new bioplastics. You can also see why [„Plastic is fantastic“](https://www.youtube.com/watch?v=eFoEHXUh_iM) on YouTube.

1. praxistipps.chip.de/wie-viel-strom-produziert-ein-windrad-das-muessen-sie- wissen\_155947 [↑](#footnote-ref-1)
2. (BMWK) provides in the ‘Glass Industry Profile’ from 2020 [↑](#footnote-ref-2)
3. Umweltbundesamt.de/umwelttipps-fuer-den-alltag/essen trinken/mehrwegflaschen#unsere-tipps [↑](#footnote-ref-3)
4. Spiegel.de, 16.03.2023 [↑](#footnote-ref-4)
5. Spiegel.de, 16.03.2023 [↑](#footnote-ref-5)