GMI eyes key role of recycled glass in transition to net-zero

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According to global markets watcher GMI, complete recyclability without sacrificing quality -and alongside its indispensable position as glass-making raw material- will likely position recycled glass as a strong contender in the transition to a circular economy.

Glassmaking ingredients have remained relatively unchanged since the emergence of the material thousands of years ago. Indeed even today most glass formulations contain silica sand, which accounts for around 70 percent of the weight, as well as other components like soda ash, also known as sodium carbonate, and limestone.

FACTORING IN THE ENERGY EQUATION

However, in recent years the growing focus has been on a fourth ingredient, which is nearly always a part of the mix - namely recycled glass. As a prominent ingredient in most glass recipes, recycled waste glass can significantly decrease energy consumption in the glassmaking process. The higher the content of this product, the lesser the use of energy in the furnace – a fact that has considerably altered the outlook of the recycled glass industry over the last couple of decades. These properties, alongside other benefits spanning from reduced manufacturer costs to improved environmental health, all contribute to the long-term profitability of the recycled glass

market, which is set to surpass USD 1.5 billion by 2027 according to one Global Market Insights report. By decreasing the reliance on virgin natural resources and the need for the CO2-emitting reaction in the soda-lime glass manufacturing process, the use of recycled waste glass or cullet is helpful in mitigating GHG emissions considerably. In Europe alone, glass recycling can save nearly 925.000 tons of waste glass from going into landfills each year, saving over 1.23 million tons of critical raw materials, and reducing CO2 emissions by almost 230.000 tons.

RECYCLED GLASS AS EMERGING TOOL OF SUSTAINABLE DEVELOPMENT

With current usage crossing 50 billion tons each year, sand has established itself as a critical industrial material for the global economy and is the second most-used resource across the globe after water. However, given the lack of specific regulations pertaining to its use, it's being consumed at a much faster pace than it can be replenished, with a UNEP (UN Environment Programme) report suggesting that rampant unregulated use could bring about an eventual "sand crisis". To address this impending crisis, which climate scientists hail among the most daunting sustainability challenges in the 21st century, the need for sustainable development remains paramount. This requires a dramatic evolution in the way products, services, and infrastructures are produced and consumed. Waste glass recycling is emerging as a key contributor to this transition, with the prospect of using recycled glass in high-performance industries like construction becoming increasingly appealing to contractors in recent years. To that end, scientists worldwide have initiated numerous R&D efforts to evaluate the potential of recycled waste glass, which would otherwise end up in landfills as an alternative to sand. For instance, in April 2022 researchers from NTU Singapore (Nanyang Technological University) devised a new way to utilize recycled glass as a material for the 3D printing of daily-use items. As a proof of concept, the team 3D printed a concrete bench using a specially formulated concrete mix consisting of commercial cement products, additives, water, and recy-

cled glass - which demonstrated enough mechanical strength to comply with accepted industry standards.

HOLLOW GLASS RECYCLING GETS A BOOST FROM BOTH PUBLIC AND PRIVATE ENTITIES

Also known as container glass, hollow glass is rapidly becoming a common packaging material in various aspects of daily life, from food & beverages to medicine to perfumes - and more. Since hollow glass products are used extensively across the industrial spectrum, the recycling of glass is becoming an important consideration for manufacturing sustainability in recent years. Bottles or containers made from glass are 100 percent recyclable, unlike other kinds of glass items like ovenware, windows, or Pyrex, which usually undergo different manufacturing processes. Despite this potential, however, a report from the Glass Recycling Foundation has revealed that only a third of these items are recycled each year, while over 6 million metric tons end up in landfills. Against this backdrop, entities across public and private sectors worldwide have initiated efforts to boost glass bottle recycling. To illustrate this, in June 2021, Constellation Brand, via its beer brand Corona, joined forces with the Glass Recycling Foundation to establish a glass recycling initiative under its 'Our Beaches' Corona Protect campaign. The objective behind this initiative was to divert glass from landfills and increase public awareness regarding the significance and merits of glass recycling. As part of the pilot program, participating Chicago-based restaurants and bars have pledged to separate glass bottles, both Corona-branded and others, into separate bulk bins for pick up. Since the project requires no colour sorting and permits a small amount of incidental contamination, it has created a relatively simple process, further encouraging participation in the glass bottle recycling ecosystem.

BRINGING THE BUSINESS COMMUNITY ABOARD

Food and beverage manufacturers have also penetrated the recycled glass market and are growing more attuned lately to the sustainability benefits of using this product in their packaging. A notable example of this is Coca-Cola United, which announced the goal to use 50 percent recycled glass material in its bottles by 2030. As part of its broader target of creating a World Without Waste, this initiative was supported by its partnership with O-I Glass, which facilitated the procurement of more recycled waste glass to be converted into new glass bottles. Glass is among the longest lasting man-made materials across the globe. Yet despite the multitude of benefits associated with its longevity, if left unaddressed the waste generated by the material can become harmful to the environment in the long run, since glass in landfills can take anywhere from 4.000 to a million years to break down. Fortunately, awareness regarding the importance of recycling has been growing steadily over the years - reinstating glass' position as a sustainable and highly recyclable material. In this context, the recycled glass market is headed for tremendous growth over the years ahead and could prove a prominent contributor to a circular economy in the long run.