

## TOWARDS NET ZERO

# Decarbonisation with glass recycling: another Zippe tour de force

Showcasing numerous reference projects, Zippe has taken glass recycling forward for many decades now. Already back in 1965, the company built its first cullet preparation plant for both hot and cold ends. Here, recycling is generally divided into its two typical areas, namely those of post-consumer glass and factory cullet.

Waste (post-consumer) glass bin



**W**aste glass can be endlessly melted and used to create new glass products. Such reutilisation is environmentally-friendly and can save up to 27 percent of energy (with 90 percent cullet usage) whilst saving many raw materials - as long as different glass products like bottles and window panes are properly disposed of at the end of their life-cycle. Recycled glass (cullet) melts at significantly lower temperatures as compared to the other raw materials. Therefore, the use of cullet significantly reduces energy consumption (0.2 to 0.3 percent for every one percent of cullet used). In this way, melting waste glass both protects the climate and saves such resources as quartz sand, soda and lime. All this also contributes to reducing any environmental impact attributed to the manufacturing process. Moreover, the costly disposal of reused waste glass is eliminated. Glass manufacturers also incorporate whatever cullet results from defects during their own production. That said, pre-sorting by the end-consumer during disposal remains nonetheless necessary. Laminated glass, crystal glass and heat-resistant glass such as laboratory glass, Ceran® or Pyrex® are all difficult to sort

during waste glass processing - leading to high production losses or the accumulation of heavy metals in the container glass cycle (for example, due to lead crystal glass cullet). Therefore, these types of glass should not be disposed of in waste glass bins. The general use of externally-sourced and processed waste glass depends upon specific manufacturing requirements for the requisite cullet purity level of whichever product is being produced. Various glass colours and types need specific purity levels for production. Depending on the application, that can vary considerably. Additionally, foreign objects such as organics, ceramic pieces, stones, or metal parts all disrupt the production process and affect the quality of the end products. Given the current raw material situation on the market, a question arises as to which path is more economical: procuring pre-processed cullet from the market or becoming more independent by investing in a processing plant and having the required 'in-house' quality.

## TYPES OF RECYCLING

### Post-consumer Glass Recycling

Recycling is gaining always greater traction as a topic. What

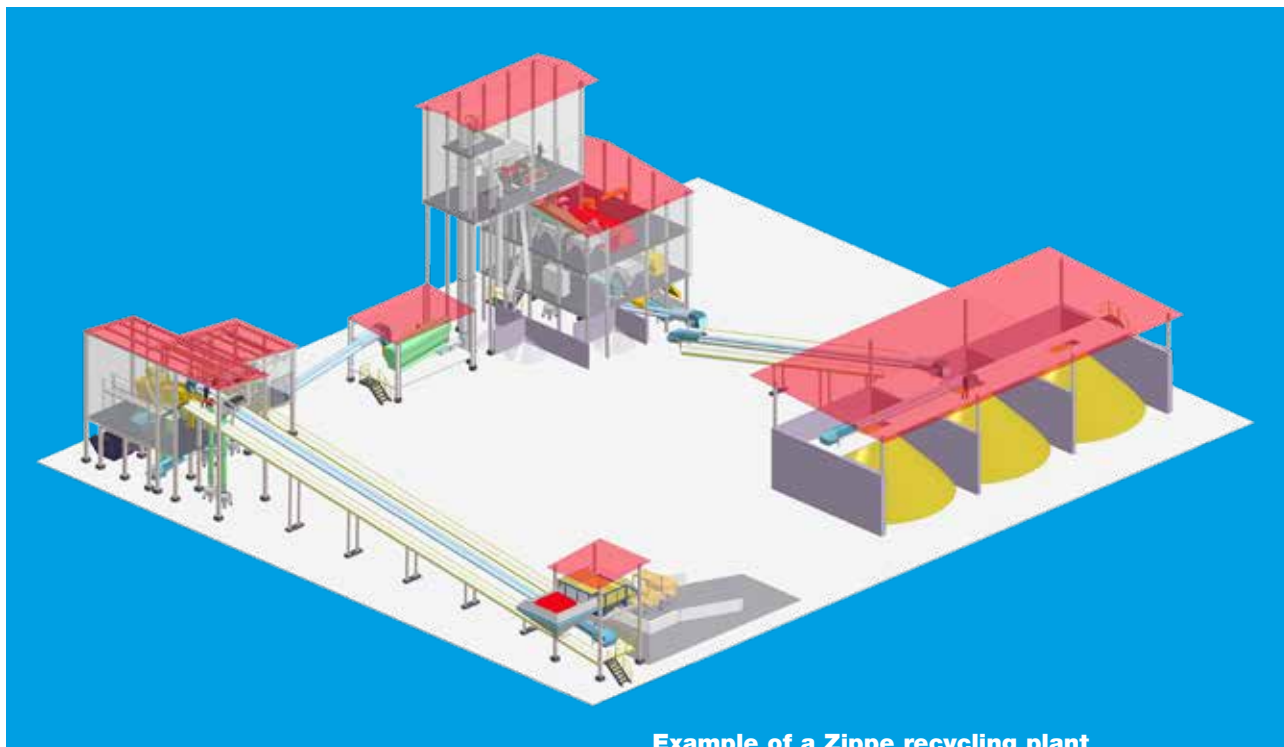
was already the norm for industrialised countries long ago, has become commonplace in nearly all countries around the world. However, significant differences remain in the quality of collection systems. In some countries, glass materials are sorted by colour while in others they are collected as mixed. Additionally, levels of foreign substances (metals, ceramics, general waste, etc.) vary greatly by country. Waste glass cannot simply be added to the production process. It must rather be processed to meet purity and grain size requirements of the glass industry. All this information, along with the required plant capacity, is typically discussed between Zippe and the customer already at the outset in order to design a recycling plant that tailored to the customer's needs. Post-consumer glass recycling plants generally include conveying technology, crushing technology, screening technology and sorting technology (for example ceramic, stone, porcelain, all metal and colour sorting). Here, Zippe designs, supplies, and constructs complete post-consumer glass recycling plants.



Post-consumer glass



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**Example of a Zippe recycling plant**

- 1. Material feeding - 2. Manual sorting - 3. Label removal**
- 4. Ferrous and non-ferrous metal separation**
- 5. CSP (ceramic, stone, porcelain) sorting**
- 6. Colour sorting - 7. Storage**

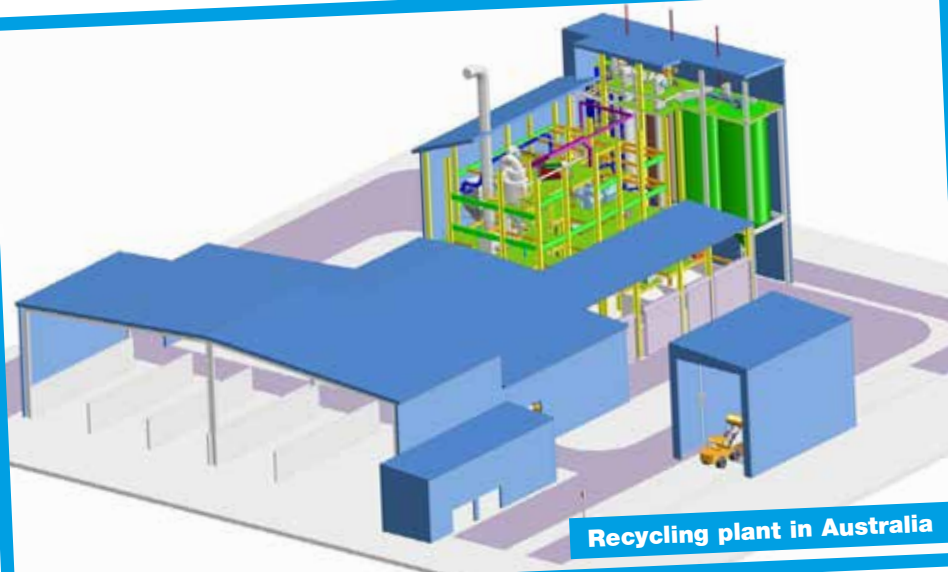
#### Internal cullet recycling / Factory cullet recycling

During the production of glass products, a certain amount of glass waste is generated in the form of hot and cold waste glass. However, glass cullet is a valuable secondary raw material for glass production. It is one of the important sources for raw material and energy savings. Sophisticated technology is necessary to effectively process hot liquid scrap glass - which can occur in droplets (hot gobs) or streams. Here, the goal is to environmentally and economically reintroduce production waste glass into the melting process. Also for this, Zippe designs, supplies and constructs complete cullet recycling plants. Such is its contribution to environmental protection as well as the recovery of both energy and raw materials.

#### RECYCLING PROCESS

Following the introduction of cullet, manual sorting workstations are often included in recycling plants - allowing for the initial removal of larger foreign materi-





Recycling plant in Australia

als. Thereafter entire bottles are crushed, together with large cullet, to facilitate more efficient sorting later on. The initial extraction of lightweight materials (such as paper, lightweight plastic parts) is often integrated at the beginning of the recycling plant. A special organic separator is used, where

lightweight materials are separated from heavier glass using a blower. To minimise the subsequent ejection of incorrectly identified cullet (due to the presence of labels), the use of a label removal system is highly recommended. In the final step, the cullet is sorted according to the required colours.



Recycling plant in Australia

## **ZIPPE'S ALL-INCLUSIVE APPROACH**

Based on the customer's information, Zippe and its partners design, construct and offer an optimal plant - globally. Here, the customer decides whether to opt for 'only' basic engineering, equipment, assembly supervision and commissioning by Zippe, or for additional services as well, such as steel construction, on-site assembly or training. Thanks to its extensive experience, Zippe advises each customer individually. The higher-level control, also developed and built by Zippe, regulates all processes of the machines used. Zippe's offer also includes a layout. Important information such as building dimensions and machine arrangement is already depicted. Thus, the customer can anticipate the space and facilities needed well in advance. Adjustments to fit the new recycling plant into existing structures are implemented by Zippe in direct consultation with the customer. Additionally, the Zippe service encompasses assembly and ultimately the commissioning of these plants. With customers able to reach the company 24/7 via its hotline, Zippe's subsequent services (troubleshooting, maintenance, etc.) are all included among its core values concerning quality standards - as is also the case with all the systems it supplies. ■

**zippe**

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