



# Accelerating International Capacity For a Circular Economy

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15<sup>th</sup> September 2023



UK Research  
and Innovation



Department for  
Energy Security  
& Net Zero



LIVERPOOL  
CITY REGION  
COMBINED AUTHORITY

METROMAYOR  
LIVERPOOL CITY REGION

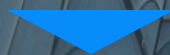
STRATEGIC INVESTMENT FUND

THE GLOBAL CENTRE OF  
EXCELLENCE FOR GLASS  
IN R&D, INNOVATION AND TRAINING





# Who We Are



We were built by the glass industry, for the glass industry to create the Global Centre of Excellence in St Helens, UK to make glass the low carbon material of choice.



Non-Profit, Membership  
Organisation



Research and  
Technology Organisation

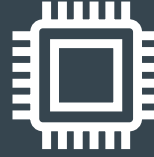


Leading the global shift to  
sustainable manufacture

# Our Mission▶



Support organizations  
Sustainability Journey



Demonstrate disruptive  
technologies



Generate new impactful ideas  
felt through the supply chain to  
the consumer

# ◀Our Vision

A sustainable future, enabled by glass.

# The Partners

## Network Space

Landowner and developer, also securing £12m private sector/institutional investment towards construction costs with a freehold and lease sale

## UKRI

£15m through Transforming Foundation Industry (TFI) Challenge fund for fit out and commissioning of R&D facility



Sheffield  
Hallam  
University

UNIVERSITY OF LEEDS



The  
University  
Of  
Sheffield.

F.I.C.(UK) LIMITED



LAND  
AMETEK  
PROCESS & ANALYTICAL INSTRUMENTS

UNIVERSITY OF  
LIVERPOOL

UNIVERSITY OF  
CAMBRIDGE

Academia

Services



Glass  
Technology  
Services  
EXPERTS IN GLASS

Pernod Ricard

VELUX®

SSRC  
SPECIAL SHAPES REFRACTORY CO.

Shell  
ENERGY

SEFPRO

DIAGEO

Brands

Suppliers

SIEMENS

Calumite

Heineken®

RÉMY COINTREAU

RYZE  
HYDROGEN

Magma  
Combustion  
Engineering

CAB

Council for Aluminium  
in Building



Societies

Manufacturers

CORNING

dsf

Sto  
STOELZLE GLASS GROUP

NSG  
GROUP  
PILKINGTON

ArdaghGroup



verallia

vidrala

encirc

RHI MAGNESITA



GUARDIAN  
GLASS

bormioli pharma

KNAUF

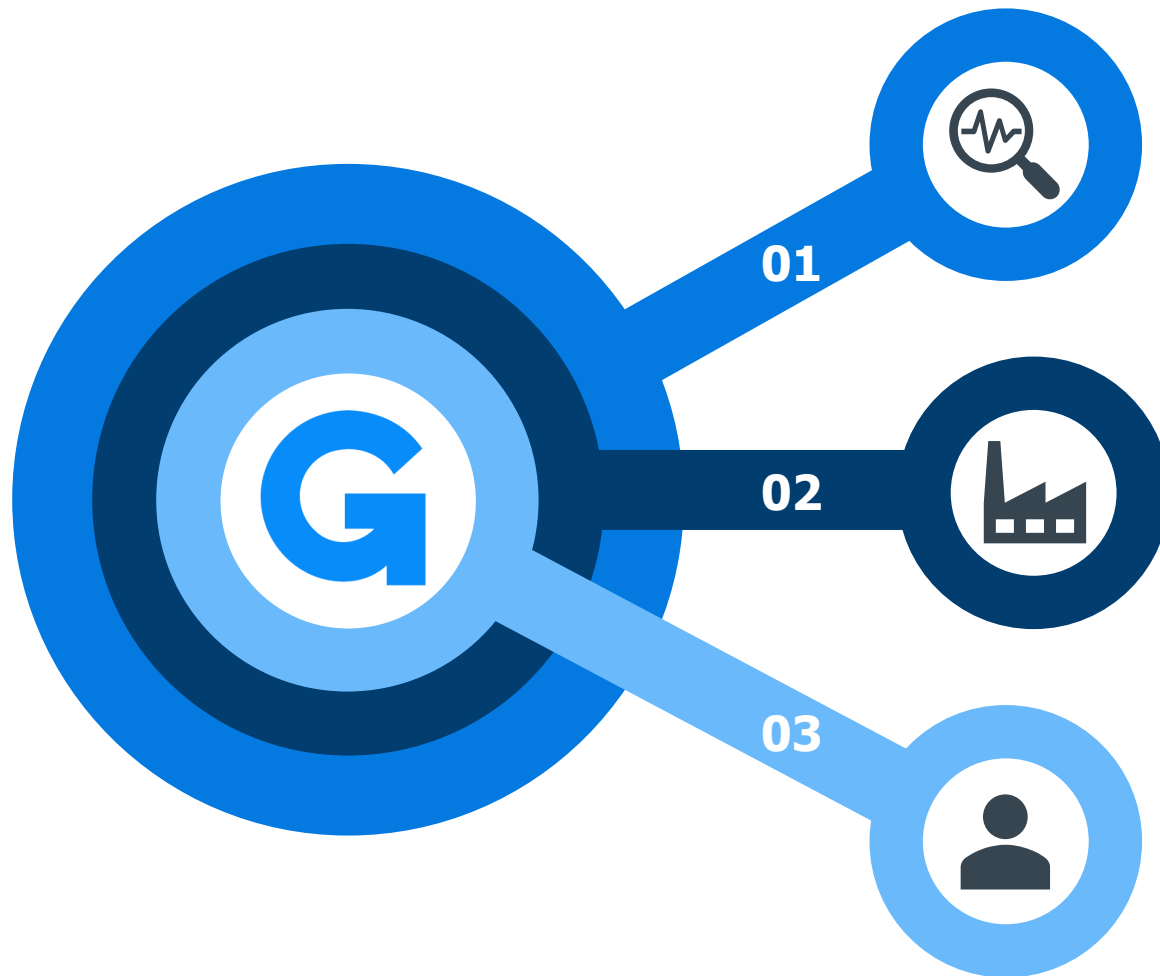
British Glass

良いものは、いつもガラスびん。  
binkyo  
日本ガラスびん協会



Glass  
Futures™

# Collaborating To Accelerate Global Change.



## **01 Academia & Research Organisations**

Provide industry with potential solutions but lack resource to upscale.

## **02 Industry & Supply Chain**

Share Cost and Resources to speed up pace of development.

## **03 End User**

Need deployable solutions more quickly to meet global challenges.

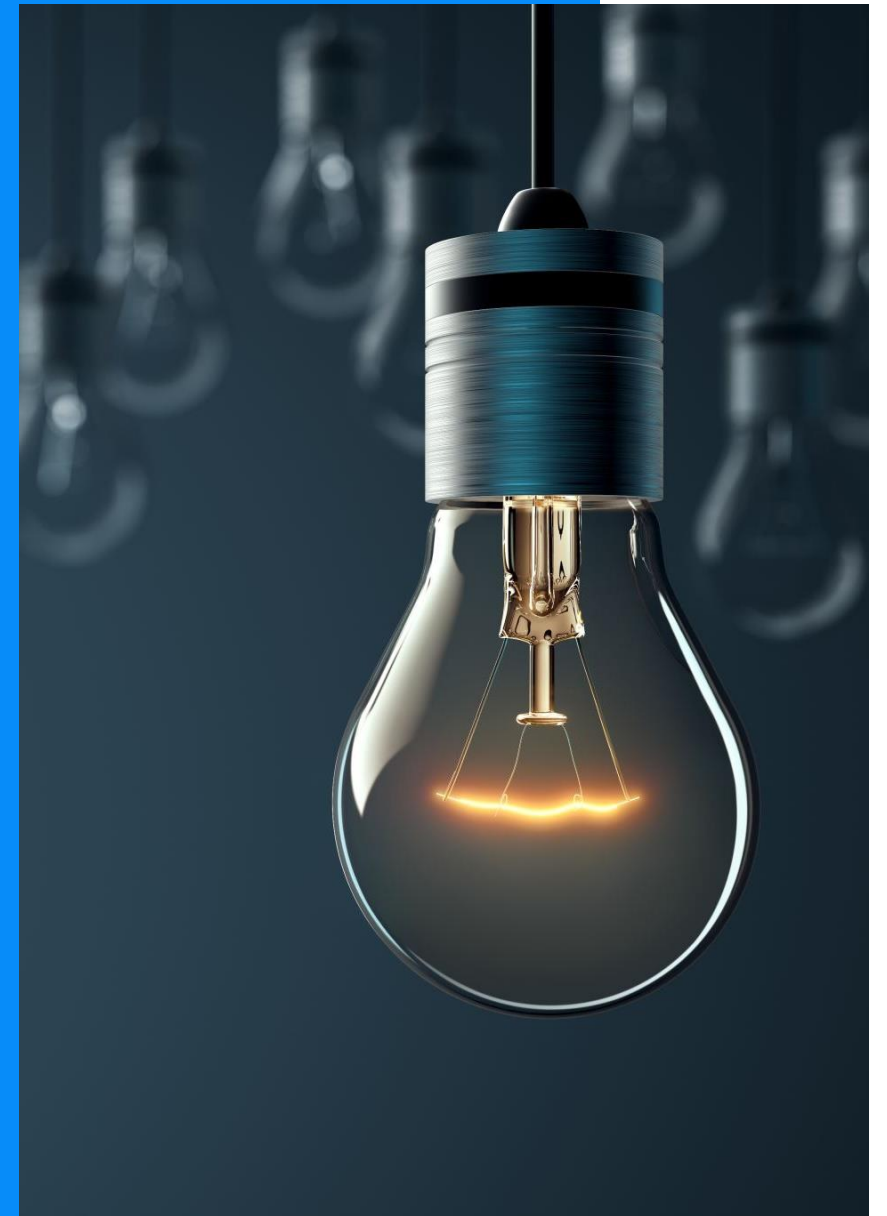
# What We Do

## No More Small Improvements We Need Disruption

This is why Glass Futures exists, we are here to be disruptors through collaboration and technical innovation.

Glass Futures is a new approach to deliver high impact, techno-economic change.

- Have a clear route to market for new technology
- Create unique glass research capability
- Bring different sectors together





# Bridging The Technology Readiness Level (TRL) Gap





# Pilot Facility: St Helens, UK

- Phase 1: 30T/day glass R&D capability
- Scope to develop a second line
- Designed to encompass all new technologies
- Benchmark low-carbon fuels:
  - Natural Gas
  - Hydrogen
  - Electric
  - Bio-fuels
- Open-Access
- Due to be commissioned: 2024





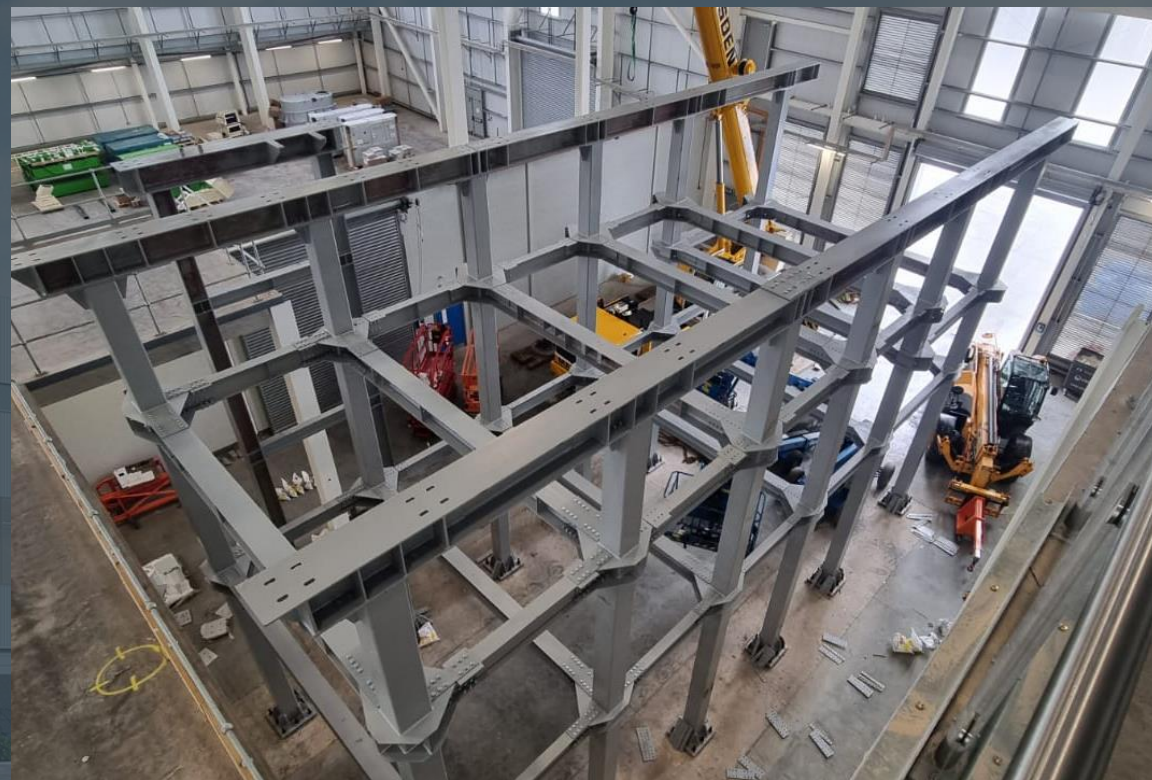








Furnace steelwork platform



Inside the St Helens Pilot facility









# Key Technology Themes

Circular economy enablers – Driving towards very high recycled content, not just from cullet

Compositions and coatings.  
Demonstrating improved strength and radical light weighting

RE USE  
Smart packaging, Re-Use and new business models to market faster

Industry 4.0 implementation for secure supply chains and more business intelligence

Heat recovery and carbon capture demonstrations to reduce industrial impact

Low carbon fuels to drive low carbon manufacturing faster

# G



# What We Deliver

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- Address the industries requirements for **net zero strategy**
- Guide your organisation through its journey to **sustainability**
- Improve **efficiency** across the supply chain
- Increase **profitability**
- Lower your organisation's **carbon footprint**
- Identify **funding opportunities** and forming of **consortia**



**First-  
mover  
advantage**



**Low cost  
technology**



**Pathway  
to  
prototype**

Develop  
Technology For  
The Future

Address  
Business  
Requirements

Access  
Innovation  
Funding



# Accelerating the Circular Economy.

- Is there a need ?
- Is there a desire ?
- Do we have the technology ?
- Do we have the structures ?
- Is it one size fits all ?

# UK

## Closing the Production Loop

Unlike some other packaging materials, glass is 100% recyclable meaning that it can be melted down and remoulded infinitely without ever reducing its quality. This means that glass can be part of a circular economy: a closed loop production that can remain in the UK which provides several benefits:

- decreases the use of non-renewable resources
- reduces carbon emissions
- opens opportunities for local companies to market their participation in circular economy

We ask local authorities to consider the destination of their glass, and to ensure their glass remains in the UK for collection, recycling, and production as this benefits both the environment and the local economy to a greater scale compared to if recyclable glass is exported.

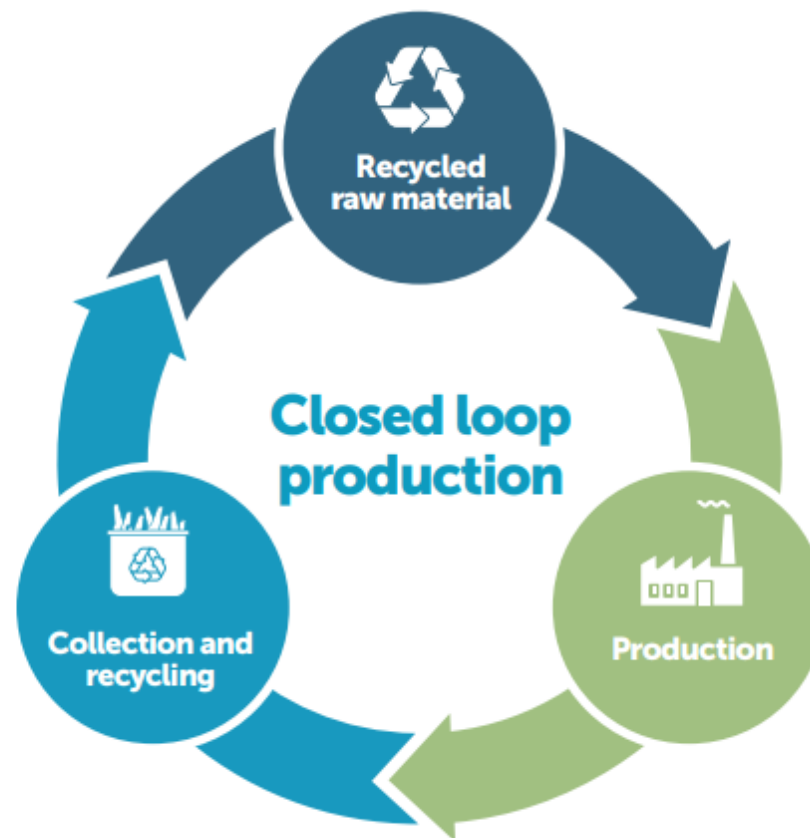


Image credit British Glass

# UK



British Glass



The UK's glass industry has an excellent recycling record with

# 68.8% of all glass bottles and jars

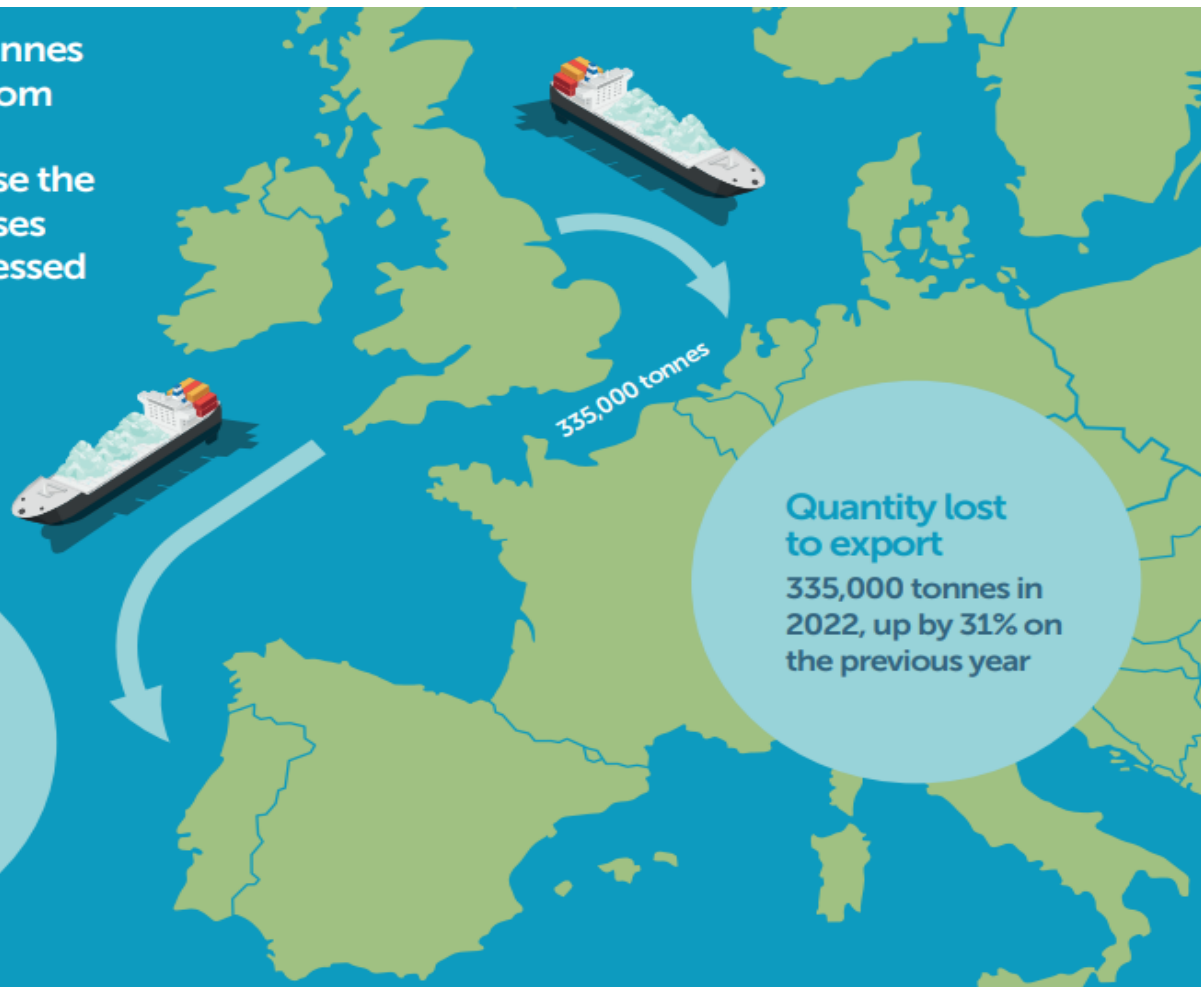
recycled last year.

**Improve** household collections. **Increase** glass recycling. **Create** a truly circular economy. **#RecycleItRight**



# UK Issues

Currently, 335,000 tonnes of glass is exported from the UK to mainland Europe. This is because the PRN system incentivises the export of unprocessed waste glass.



➤ The PRN system allows glass exporters to claim a remelt PERN on unprocessed waste glass.

➤ This incentivises export as they receive the same value as a UK remelt PERN without the investment in processing, energy, staff, technology costs and colour sorting equipment.

Image credit British Glass



# UK Issues

## ➤ Why do we object to a Deposit Returns Scheme?

➤ Two thirds of UK adults (69%) say that recycling glass bottles through household waste collections would be more convenient than returning them to a dedicated return point.

➤ Initial cost to consumer discourages use of Glass

➤ Divides the recycling stream between beverage and non beverage containers.

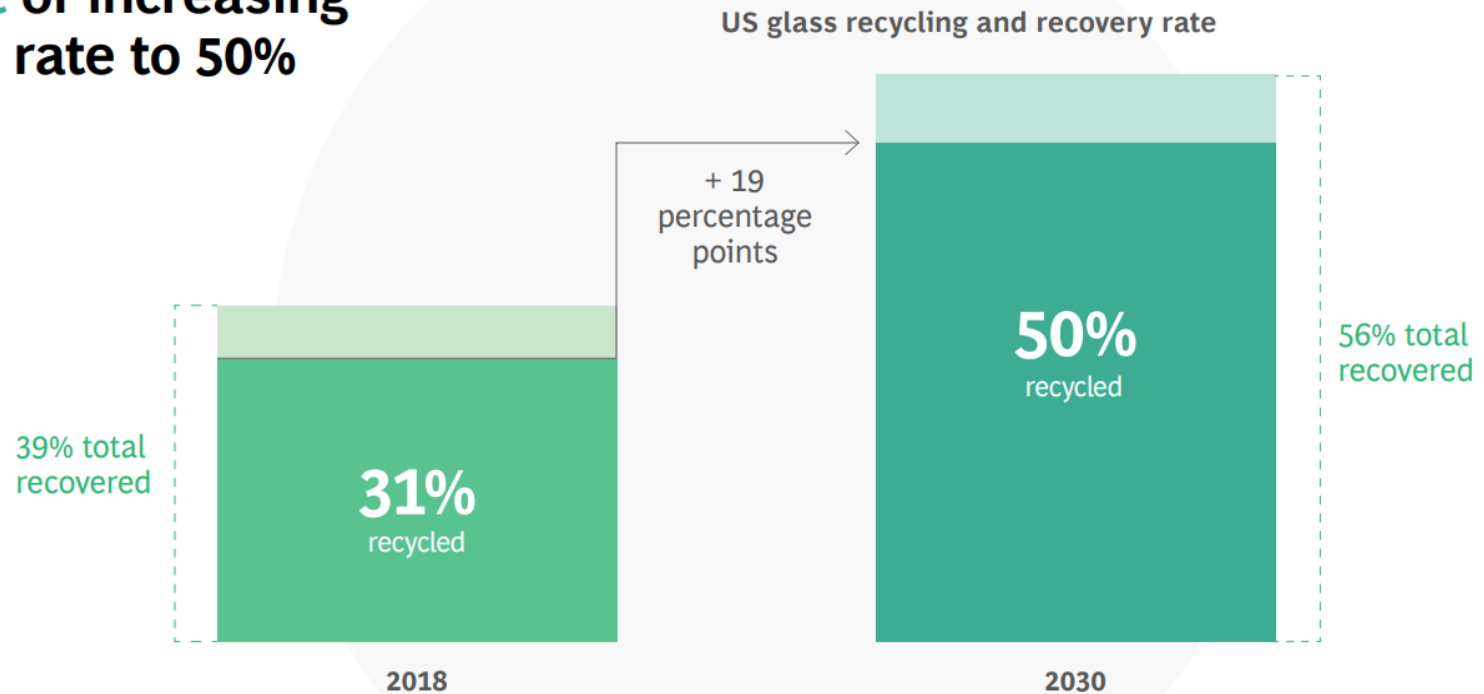


# **U.S.A.**

- **Only a third gets recycled into new product.**
- **Compared with Europe at between 70 and 90 %**
- **50 % goes to Landfill.**
- **Each state has its own policy and procedures.**
- **Is there public engagement?**

# U.S.A.

The glass container industry has set a **bold target** of increasing the US recycling rate to 50%



Sources: United States Environmental Protection Agency; Glass Packaging Industry (GPI); BCG.

Note: The 39% figure represents the rate of glass recovered (or collected), but some recovered glass is lost to landfills or as it moves along the recycling value chain, from sorting to processing to manufacturing. The remaining 31% is recycled into new containers. Some variability exists in how recycling rates are calculated across the US.



# U.S.A.

The industry's goal is **ambitious** given the current status of glass recycling across the US

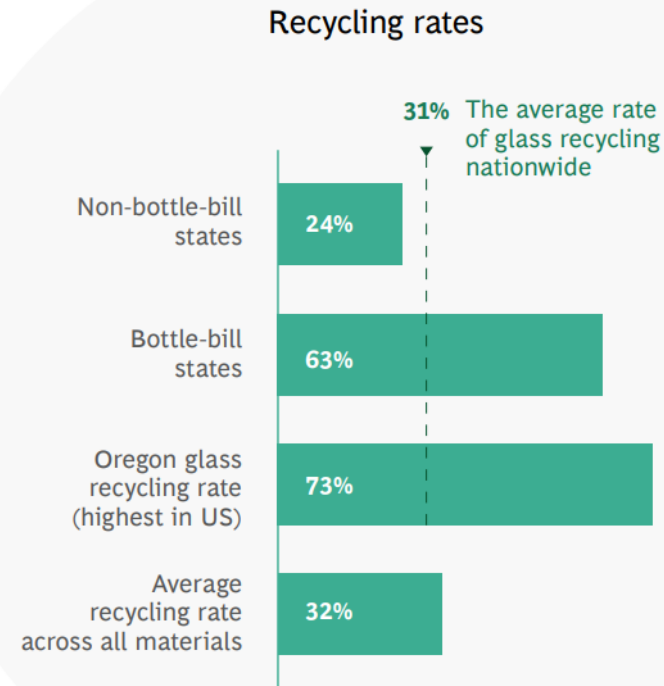
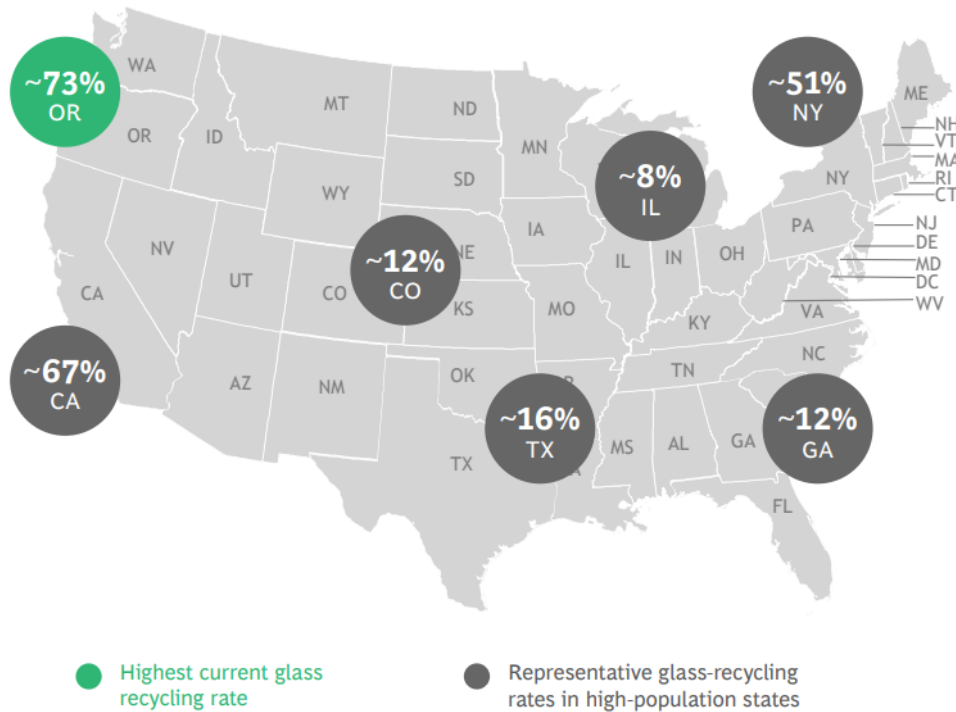


Image credit Boston Consulting Group



# U.S.A. Issues

- 1 Consumers lack the incentive to recycle if inconvenient; opt-in and subscription models lead to low participation
- 2 Rising materials recovery facility fees (\$100+/ton) and pressure from the waste management industry have caused some municipalities to remove glass from curbside recycling
- 3 The lack of recycling mandates and high levels of contamination cause a significant portion of materials to be disposed of in landfills
- 4 Low landfill tip fees for many MRFs (as low as \$9/ton) incentivize sending glass to the landfill
- 5 The lack of capacity in certain areas hinders the ability to meet the market demand and reduces the incentive to invest in materials recovery facilities
- 6 In some regions, strong demand for cullet from other end markets reduces potential supply for glass containers
- 7 The distance between the sources of and markets for cullet requires long-haul shipping, sometimes over 200 miles



# India

- **Estimate of Glass recycled each year vary between 35 and 45 %**
- **Challenges in collecting and sorting waste including cost of bottle cf cullet.**
- **Again varying structures across the country.**
- **Tremendous opportunity to grow recycling infrastructure along with the glass industry.**



# India

➤ **BUT please let us TALK.**

➤ **YOU are the experts.**



# What We Deliver

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# Common Themes

➤ **Education**

➤ **Government Support.**

➤ **Energy / Decarbonisation considerations.**

➤ **Collection Infrastructure / policy.**

**AND.....**



# Collaboration



**With dedicated local professionals here in India supported by our global resources.**

## **01 The Glass Industry**

From supply chain to manufacture.

## **02 Academia**

Using both global and local research and innovation.

## **03 Government and Non Government Organisations**

To campaign for and in the end mandate the need to recycle and create the infrastructure needed.

An architectural rendering of a modern, multi-story building with a large glass facade. The building has a complex, angular design with multiple levels and a prominent glass entrance area. A parking lot with several cars and a white van is in the foreground. A low hedge separates the parking lot from a grassy area. The sky is overcast with grey clouds. The overall tone is professional and modern.

# Thank you for your time

Please contact for more information

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