



## **Glass : Delivering packaging solutions to the world**



**Presented at  
World Packaging Congress  
October 9-10, 2015**

## Global Container glass market

- Global Glass Packaging Market is expected to grow at a CAGR of 3.9% from 2014 to 2019 to reach a value of \$60 Billion.
- Asia-Pacific region dominated the overall glass packaging market with 33% market share.

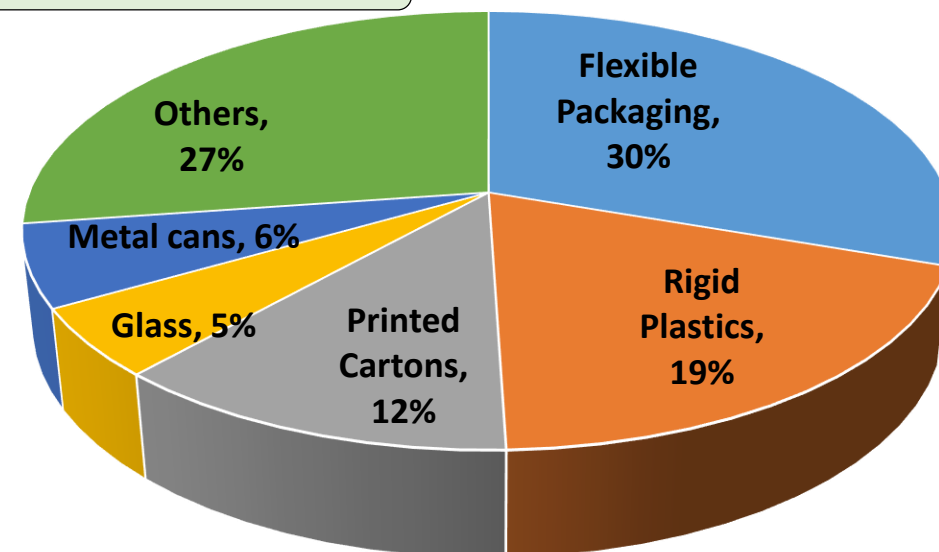
Asia-Pacific is primarily dominated by China and India owing to the vast consumer base in these countries.

- Alcoholic beverage takes the topmost position in the glass packaging market with around 58.3% share by value
- Pharmaceutical packaging application is expected to have the highest growth - CAGR of 4.2% in terms of value from 2014 to 2019.

## Indian Market Overview

- At USD 14 bn, Indian packaging industry has been growing at ~ 15% over the last few years.
- Indian glass container market is estimated to be around USD 1.1 Billion and is growing at the rate of ~10% p.a. By 2020, it is poised to grow to USD 2.2 Billion.

## Indian Packaging Market



# Container Glass Industry in India - A Profile



**Production Capacity**

**10,000 TPD**

**Revenue to exchequer per annum**

**Rs. 650 Cr.**

**Export in 2013-14**

**\$ 172 Million**

**Employment in Nos**

**400,000**

**Investments made in last 5 years**

**Rs. 7,500 Cr.**

**Investments expected next 10 yrs**

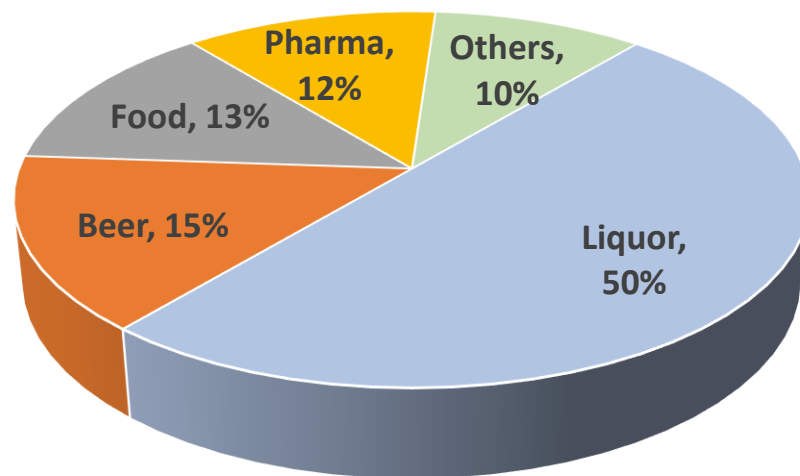
**Rs. 10,000 Cr.**

**Environment friendly  
& 100 % Recyclable**

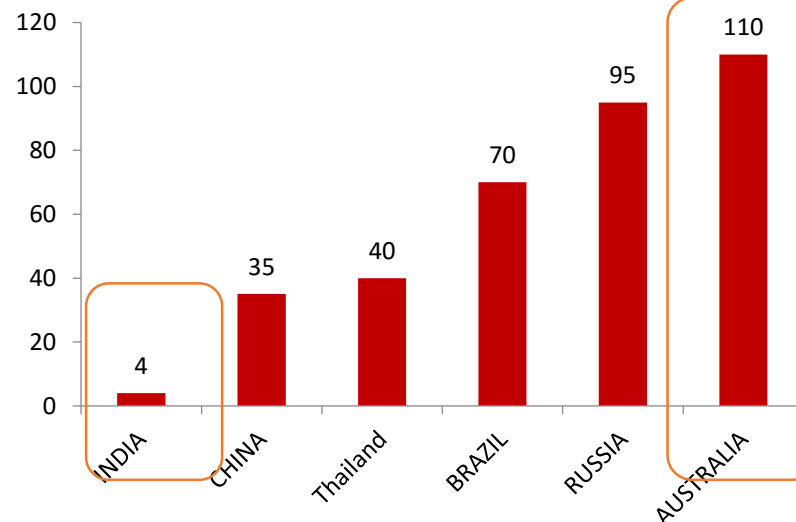
**Non-Porous, Impermeable  
& Inert**

# Macro Fundamentals are Strong

Container Glass % Usage in End user Segment

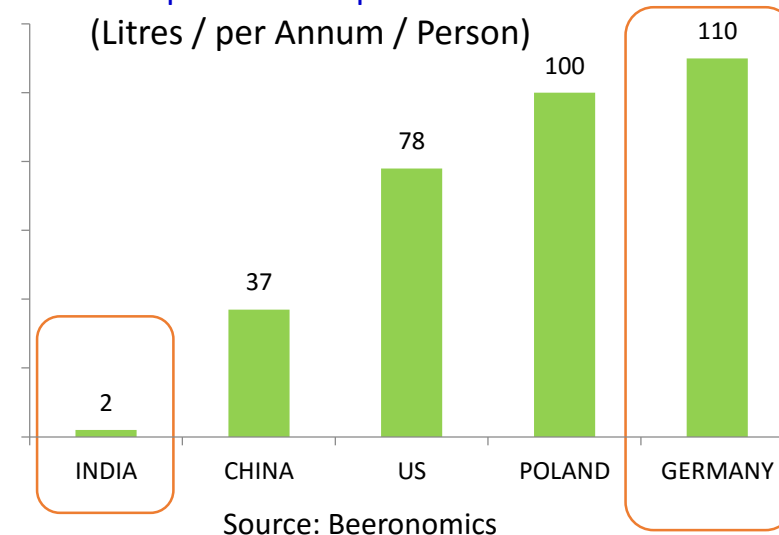


Per-Capita Consumption of IMFL (Litres / per Annum / Person)

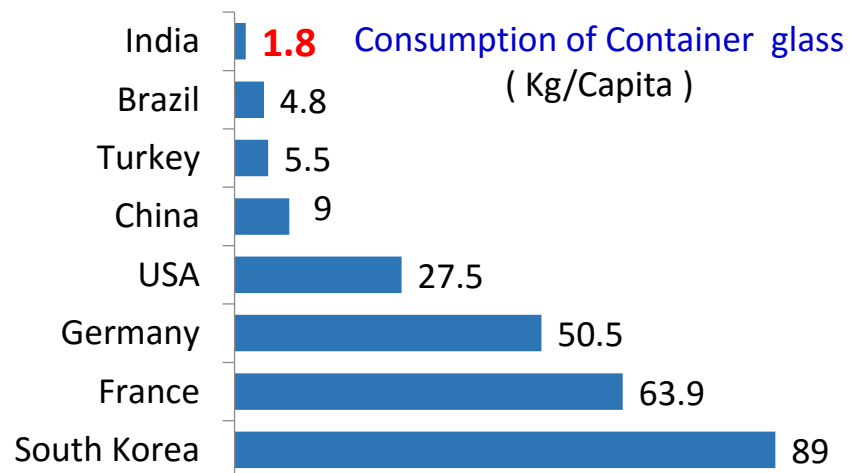


Source: Anand Rathi Research

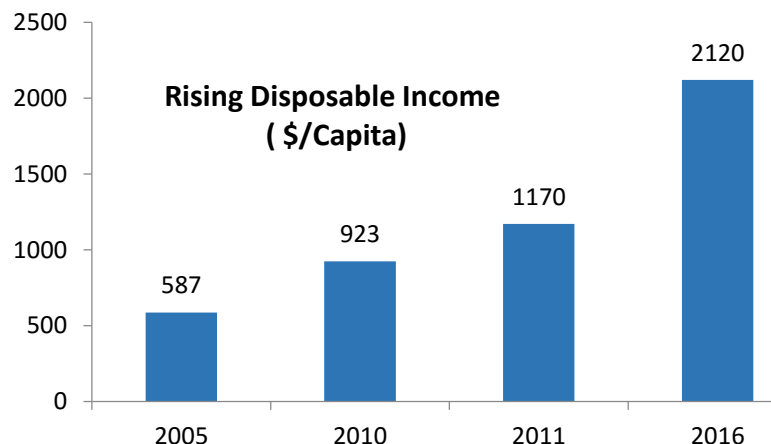
Per-Capita Consumption of Beer (Litres / per Annum / Person)



Source: Beeronomics



Source: Economist Intelligence Unit



- ❑ Alco-Bev contributes 65% of Glass demand .
- ❑ Alco-Bev segment Per capita Consumption is very low compared to other countries.
- ❑ Increasing urbanisation, high disposable income and changing social ethos will boost growth opportunity end user segment.
- ❑ Increased awareness of public about health & hygiene aspects-Glass-Eco-friendly.
- ❑ Reverse Migration in Pharma has began.

## Encouraging signs for Indian container glass market

**2 Indian whisky brands Royal Stag & Officer's Choice soaked in \$1 billion in retail sales**

**Diageo taking full control over USL.**

**Stable Government at Centre**

**Green shoots of Economic growth**

**PepsiCo Inc & Coca cola investing \$5 billion each during 2012-2020**

**Beer Players - Carlsberg, Molsoon Coor, Budweiser expanding in India**

# End User Segment – Growth Drivers for Container Glass Industry

- ❖ Liquor Segment contributes 50% Volume & growing at 12% CAGR .
- ❖ Per capita Liquor consumption - only 4 L compared to 110 L in Australia ,95 L in Russia and 35 L in China.
- ❖ The growing proportion of nuclear families, urbanization and changing social ethos will ensure sustained demand growth for the liquor industry.
- ❖ Focus by all players on Premium segment and above.
- ❖ Strong focus on Quality and Hygiene - to reduce reuse.



- ❖ Beer contributes 15% Volume
- ❖ Beer growth @ 12% CAGR .
- ❖ Per capita Beer consumption is only 1.8 L compared to 35 L in China & 76 L in Russia. MNC like UB, Carlsberg, Sab Miller caters ~85% of the Market
- ❖ Segment is expected to grow at robust pace due to young population ,high disposable income and increased urbanization.



## Pharma

- ❖ Pharma presently contributes 12% Volume & growing at 16% CAGR.
- ❖ India is 3rd largest market in world –Volume Terms / 14th –Value terms.
- ❖ GoI has notified on 29<sup>th</sup> Sep'14 , proposing ban on Plastics and PET in oral formulation – expected incremental market of 3 lacs MT per annum.
- ❖ Reverse migration to Glass has begun.



## Food & Soft drink

- ❖ Food and Soft drinks contributes 18% Volume
- ❖ Packaged food - 15% CAGR, Juices - 35% CAGR,
- ❖ Soft drinks ~Per capita consumption is 12 L compared to global average of 92 L
- ❖ Coke & Pepsi control 95% of the market



# Indian container glass industry working with Global players

## Technology Partners

### Batch house



### Furnace distributors and Fore hearths



### Hot end equipment



### Cold end equipment



### Utilities



## Customers

### LIQUOR



### BEER



### FOOD



### SOFT DRINKS



### PHARMA



## Glass – what & why



- ✓ Made from all natural and sustainable raw material
- ✓ Mixture of silica sand, soda-ash, lime stone and other trace elements
- ✓ Glass is 100% Recyclable and can be re-used more than 40 times
- ✓ Glass is chemically inert and pure
- ✓ Glass is “Generally rated as safe (GRAS)” and is graded safe by the U.S. Food & Drug Administration

Every ton of glass recycled saves 322 Kwh of energy, 246 kg of CO2 & 1200 kg of virgin raw material

Helps in Savings on Waste collection, Transportation and Disposal costs

Product packaged in glass denotes premium quality

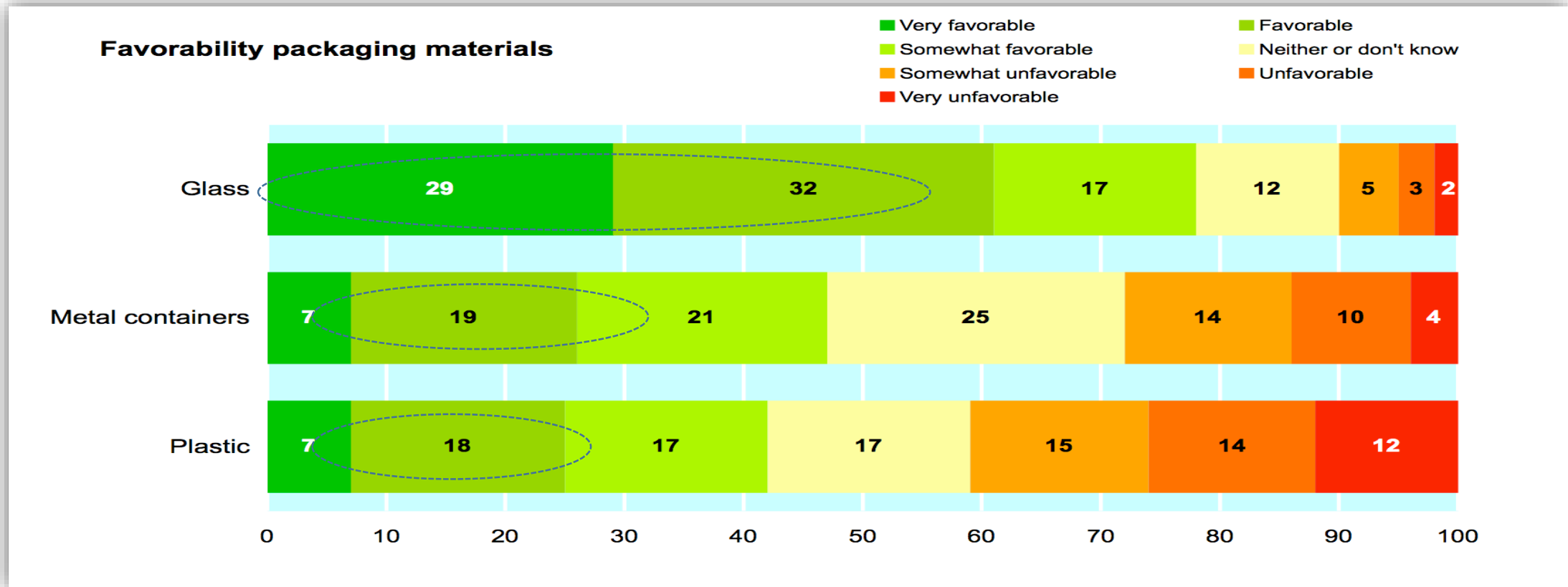
Suitable for high speed filling lines

Reduces the Quantity of waste to be treated or disposed

# What the consumers say across the globe ....

92% of consumers want safe drinking water and are willing to pay more for a better packaging than Plastics

60% say they are willing to pay more for more sustainable packaging as compared to plastics



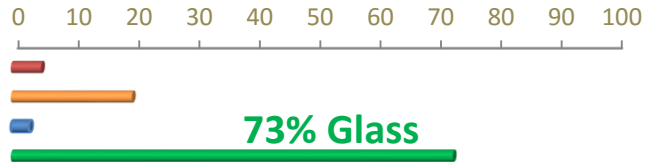
72% say they want more environment friendly packaging

81% want industry to use more glass containers

Source : European Container Glass Federation (FEVE) Consumer Research

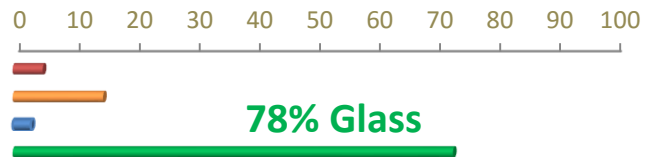
# What the consumers say across the globe ...

## Trust Glass



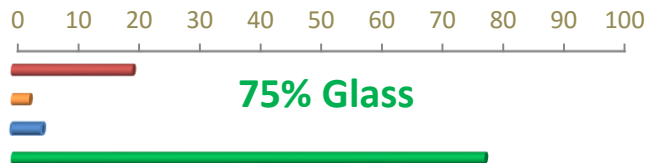
### Highest Quality

73% of consumers surveyed believe that **glass keeps the highest quality of any container**



### Most Pure

When purity is essential, 78% of consumers surveyed feel **glass is best at maintaining that purity.**

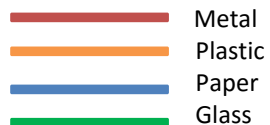


### Truest Flavour

75% of consumers surveyed agree that **glass keeps the truest taste and flavor of the product inside.**

Glass has been the preferred packaging choice for food and beverages since it was first introduced.

It's no wonder the leading food, beverage, beer, wine and spirits brands continue to trust glass containers to preserve both their products and their brand image.



# What the consumers say across the globe ...



## The Natural choice

Organic food and beverage manufacturers go to great lengths to ensure the quality and purity of their products.

Glass also portrays a premium image and enhances shelf appearance.

### Taste

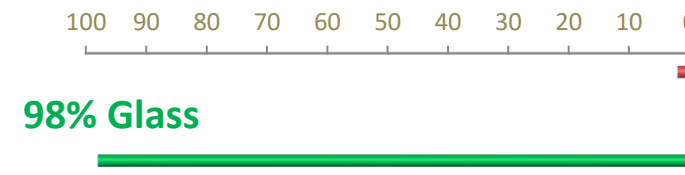
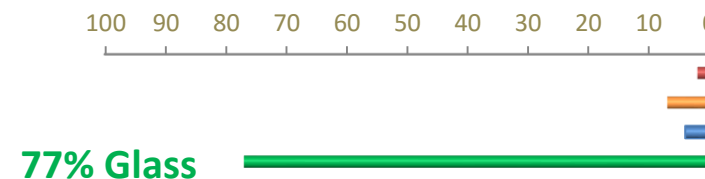
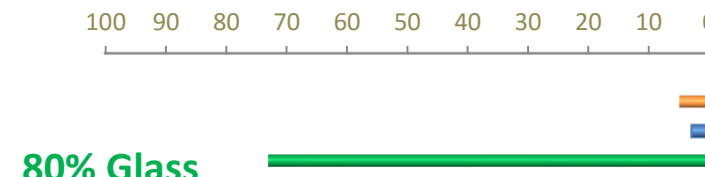
The fact that glass never loses purity makes it easy to see why nearly 80% of organic food consumers feel that **glass is best for maintaining the true flavor and taste of their products.**

### Health

77% of organic American families feel that **glass is the healthiest way to preserve foods.** They also agree that healthy foods make healthy families.

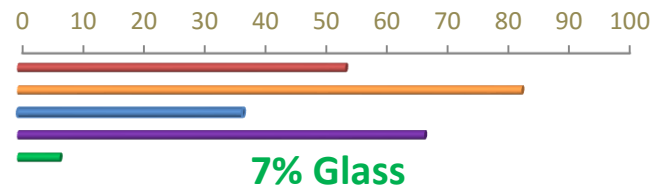
### Most Appealing

Just under 98% of consumers find the **appearance of glass to be most appealing when making a wine purchase.**

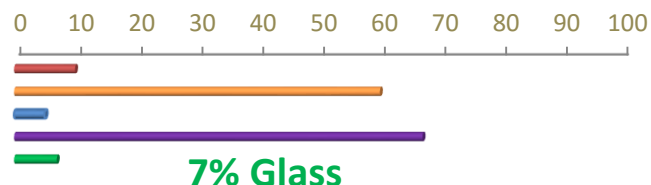


# What the consumers say across the globe ...

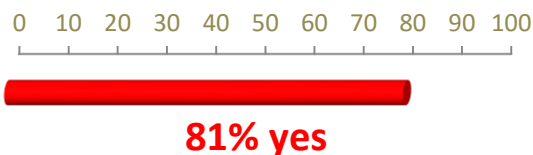
## Protect your health



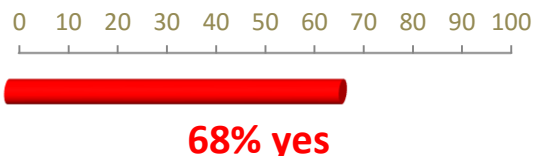
7% Glass



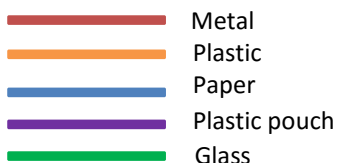
7% Glass



81% yes



68% yes



## Glass safe

Glass is seen as one of the containers *least likely* to leach chemicals into foods.

## Glass is green

Glass is seen as one of the *least polluting* containers.

## Material Matters

81% of consumers believe that **the container you choose, depending on its material, can leach chemicals** into the product.

## Purchase persuasion

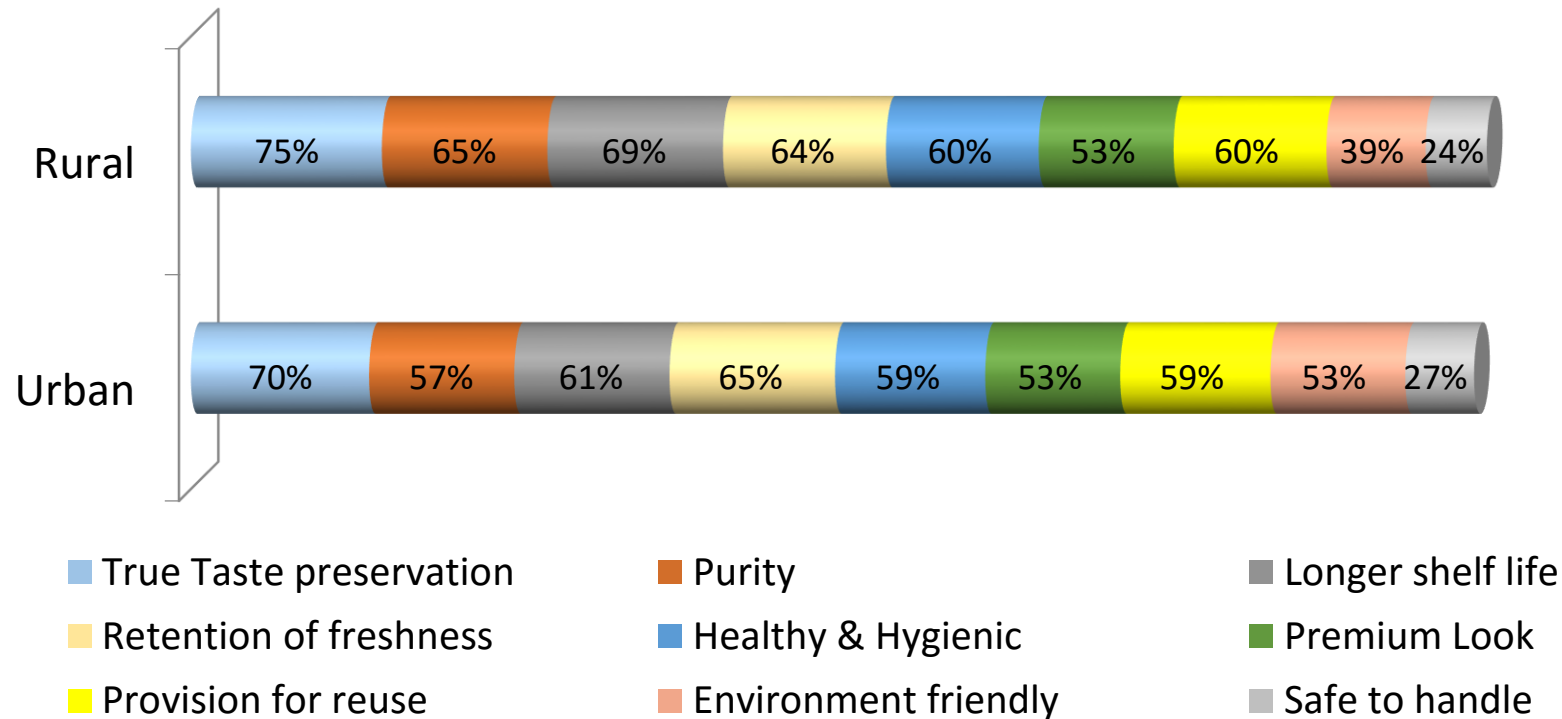
68% of consumer **purchases are influenced by the health impact of the container** housing the product itself.

Consumers are becoming more aware of packaging and how it can affect the foods and beverages they consume.

Not only do glass containers protect the flavor and purity of organics, but choosing glass demonstrates an elevated commitment to sustainability and the preservation of our natural resources.

# Do Indians prefer glass ???

- ❑ Rural consumers seem to prefer glass more than urban consumers considering all aspects
- ❑ Glass is considered the best in true preservation of taste and retention of freshness
- ❑ Safety in handling is the only major issue in which glass is least preferred



**75% of respondents across all categories (urban and rural) are willing to pay premium for modified glass packaging**

# Retail glass packaging growth

## North America ( 11% market share)

Mature market with stable long term growth prospect driven by increasing share of glass packaging in Beer & new consumption habits

## Europe ( 34% market share)

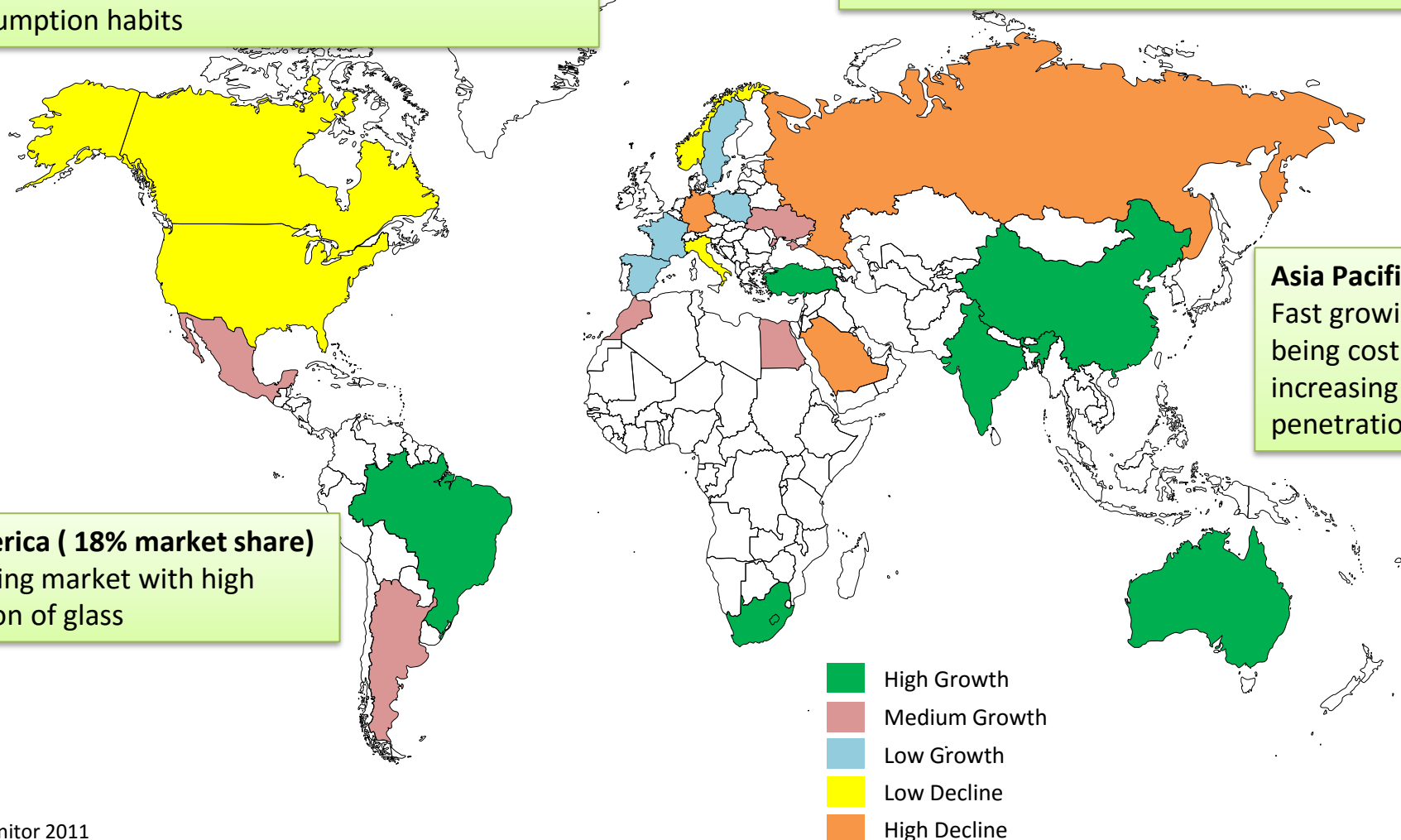
- Weak growth history due to economic recession
- Showing signs of recovery in certain regions

## Asia Pacific ( 34% market share)

Fast growing market with demand drivers being cost advantage, demographic trends, increasing income, consumerism & low penetration

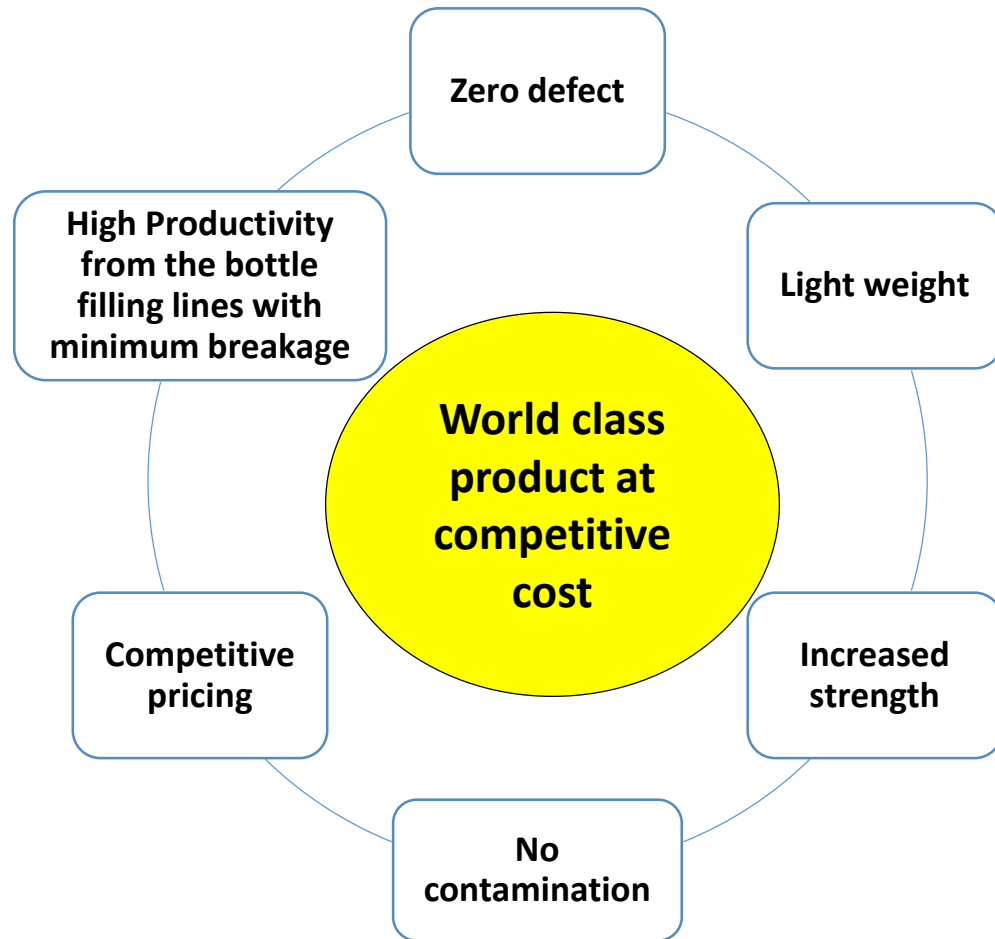
## Latin America ( 18% market share)

Fast growing market with high penetration of glass

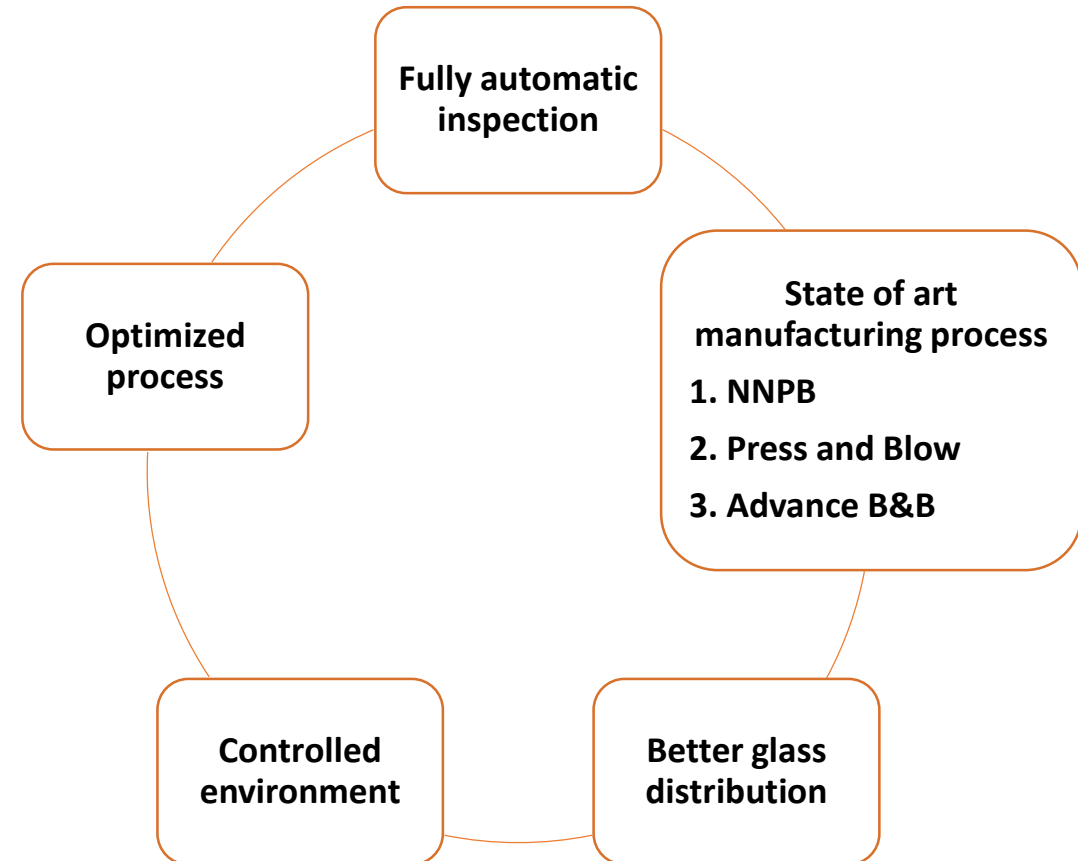


# Global customers : wish list

What global customers look for in glass packaging ..

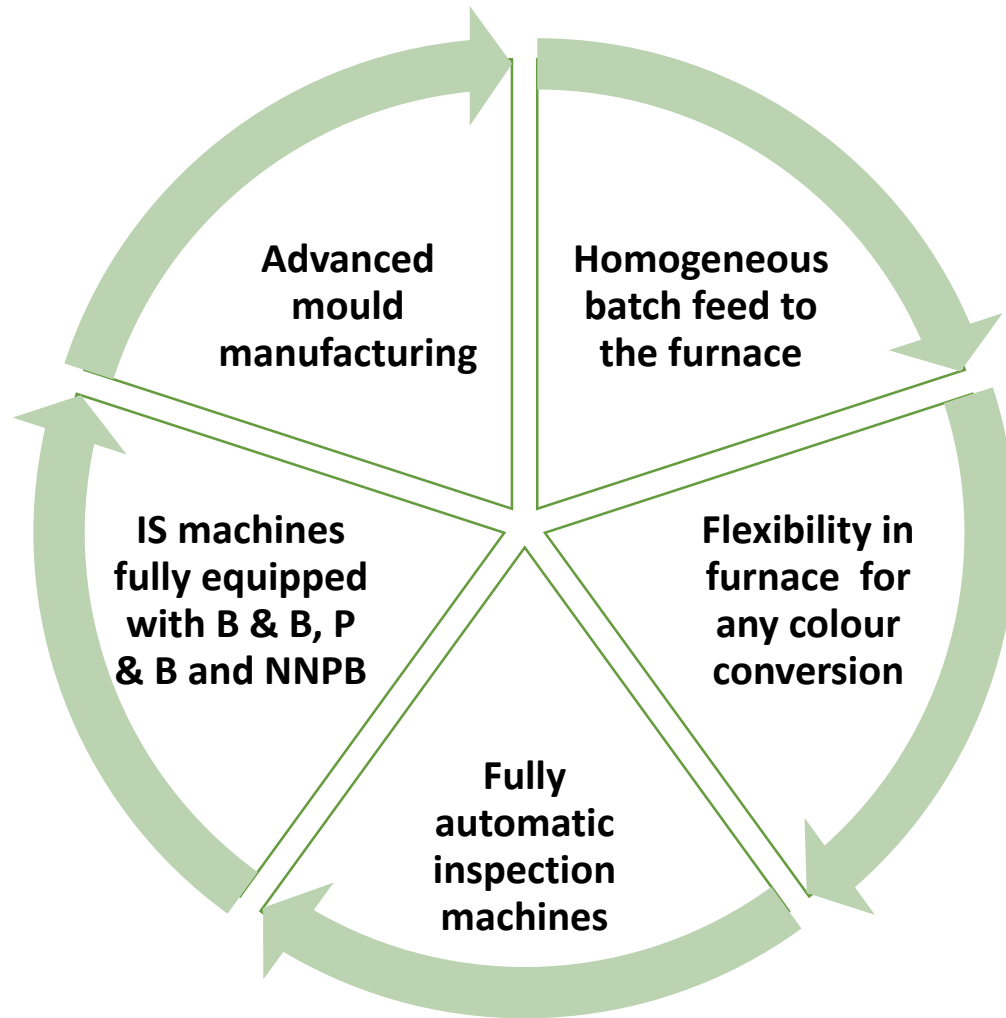


What is required to satisfy them..



Latest Technology at each step is the answer..

# What a 21<sup>st</sup> century container glass plant needs to have



## What Technology gives

- ☐ Reliability , Repeatability and Reproducibility in making glass bottles.
- ☐ NNPB & Advanced B&B process produce light weight glass bottles with increased strength.
- ☐ Bottle of any size ( 3 ml - 3200 ml ) & colour can be manufactured as per customer need.
- ☐ Reduced cost of production gives global competitive edge.
- ☐ Controlled conditions with minimum manual intervention give contamination free glass bottles.

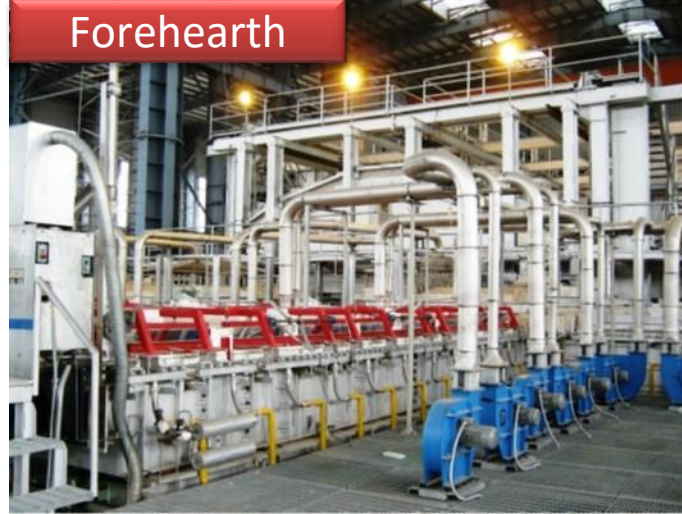
**State of the art technology & process is a pre-requisite to fully cater to the MNC customers**

# State of the art plants in India

Batch House



Forehearth



Bottle forming



Packaging

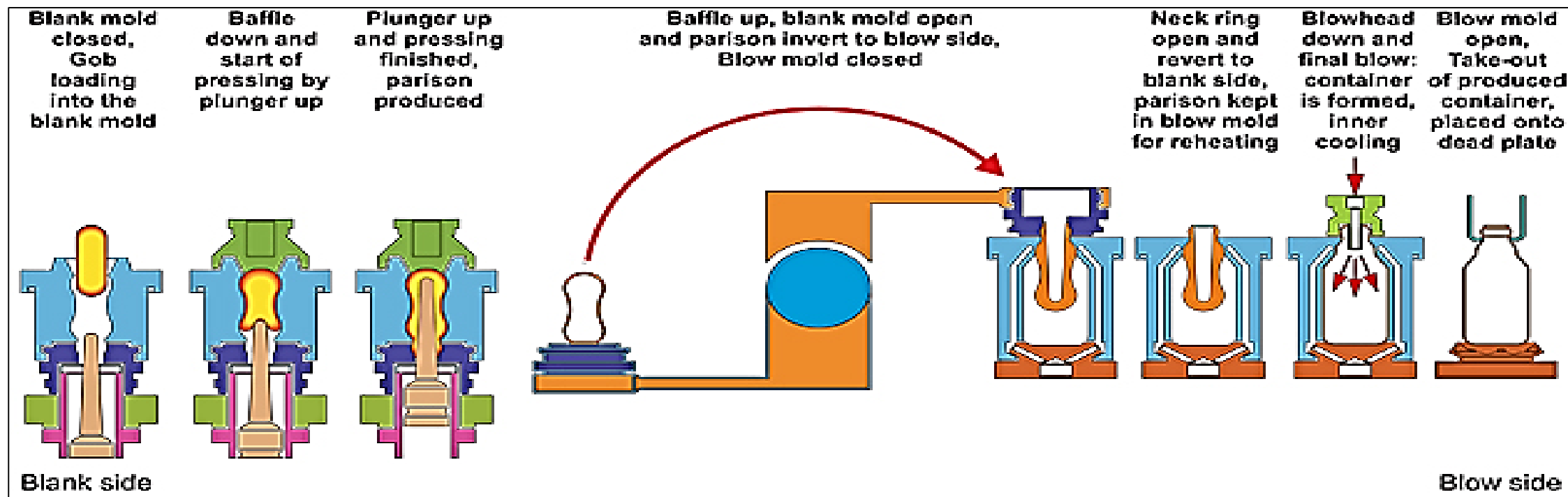


Cold End



Inspection





**What it is** - NNPB is a revolutionary process that not only controls the distribution of glass inside the container, but also reduces the weight of glass by 33% without having any adverse effects on the performance of the glass containers.

### Advantages

- ☐ Better glass distribution throughout the bottle.
- ☐ Lighter in weight - lower consumption of molten glass.
- ☐ Lower cost.

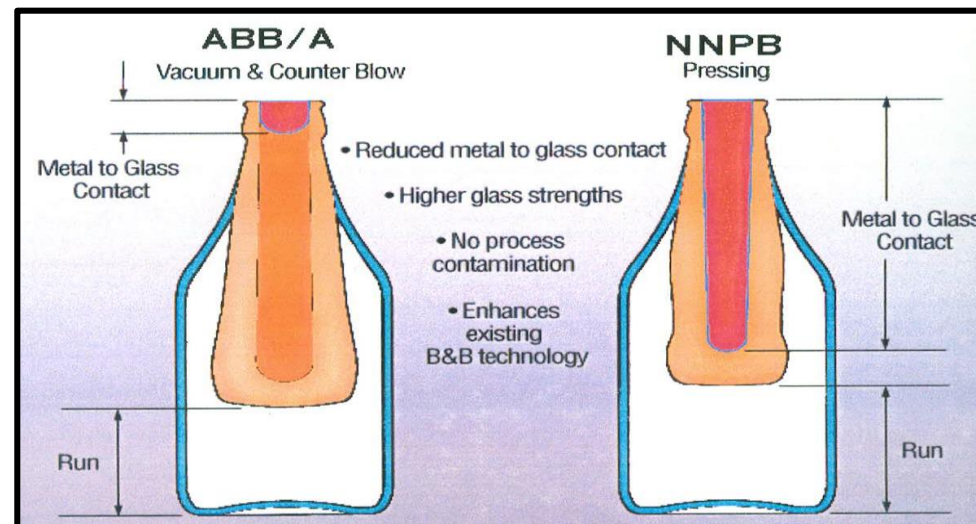
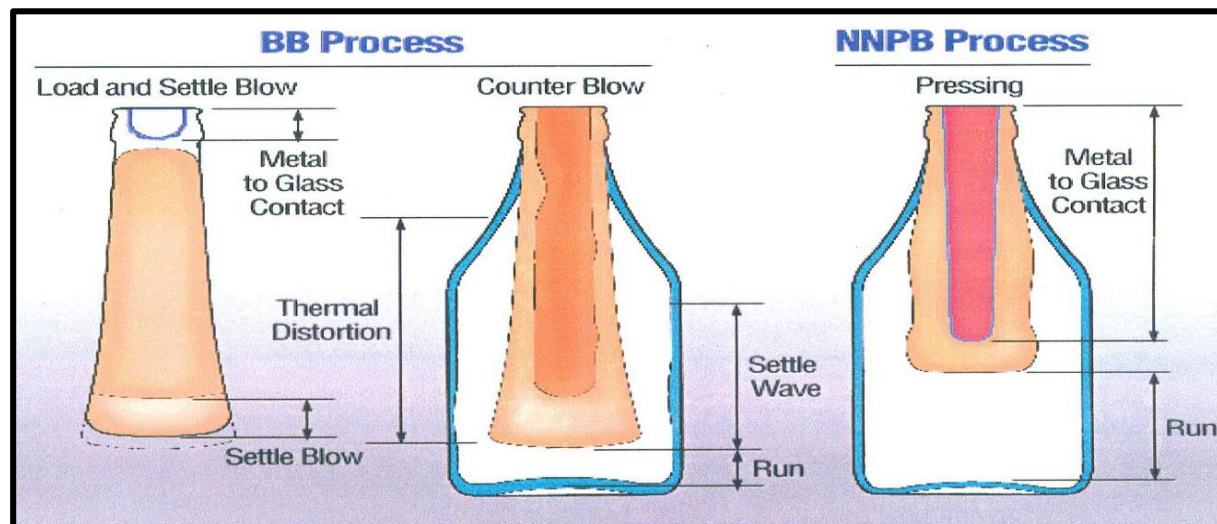


ABB - uses AFCON & Vacuum Technology to get the benefits of Both B&B and NNPB processes

### Advantages

- ☐ Better Glass Distribution
- ☐ Higher glass strength due to reduced metal to glass contact
- ☐ Reduction in Glass Container Weight

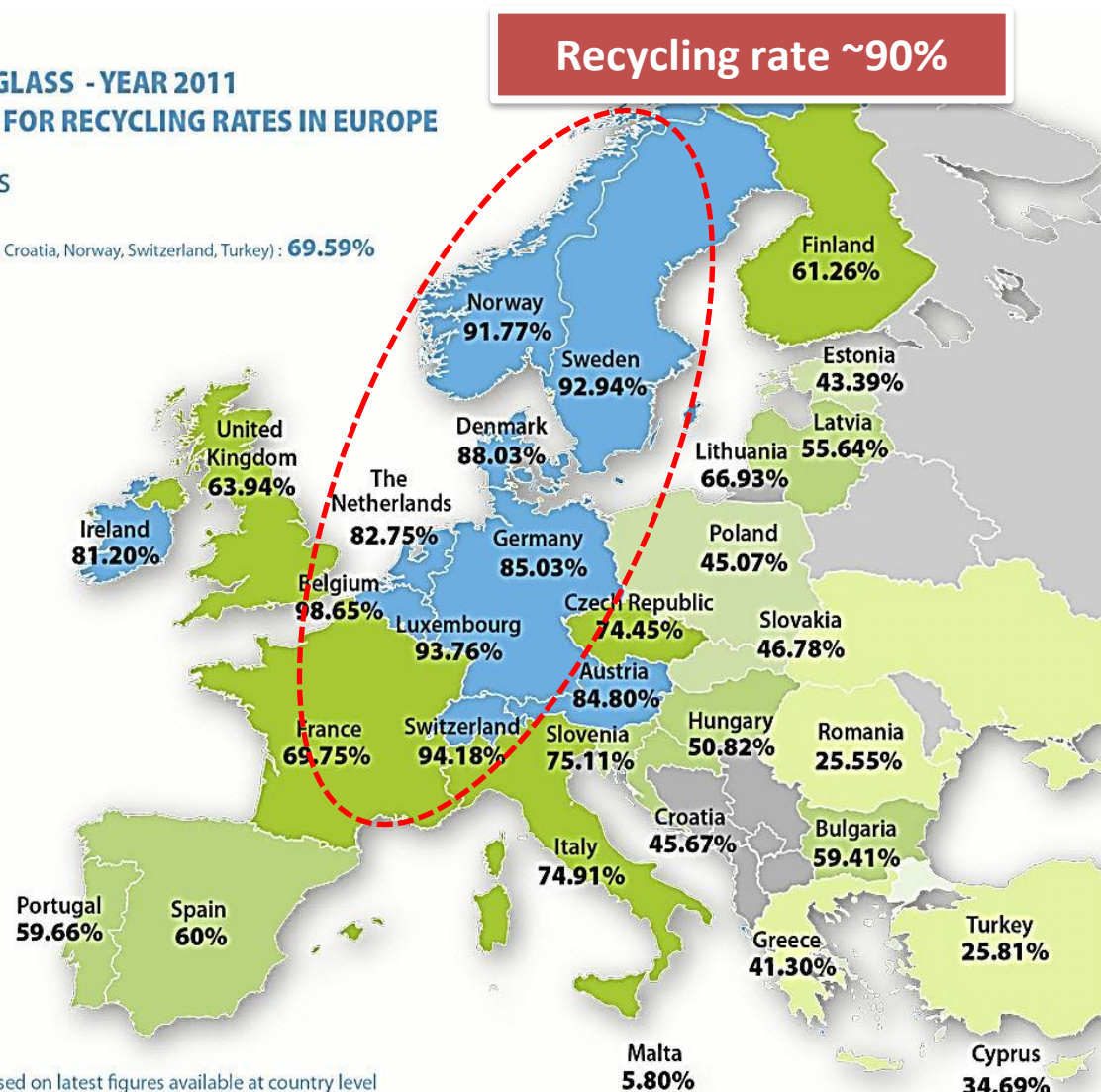
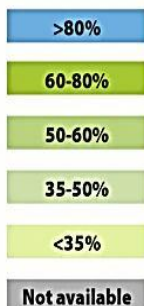
# Glass recycling – more the better

## CONTAINER GLASS - YEAR 2011 COLLECTION FOR RECYCLING RATES IN EUROPE

### AVERAGE RATES

EU27: **70.28%**

EUROPE (including Croatia, Norway, Switzerland, Turkey): **69.59%**



Estimated data based on latest figures available at country level

Source: European container glass federation (FEVE)

- ❑ Recycling glass decreases amount of raw materials used, lessens demand for energy, cuts CO2 emissions, extends furnace life.

- ❑ *At 50% recycled glass in manufacturing, Removes 2.2 million MT of CO2 emissions = 400,000 cars off the road each year.*

- Europe uses almost 70% recycled glass on the average
- Only 40% glass is recycled in India & rest goes into landfill

# LCA Study on container glass in India – key findings



## What is LCA ?

The Life Cycle Assessment (LCA) is a tool to measure, assess and orient improvements in the environmental performance and impact of a product from raw materials through to production, use, and end-of-life phases.

## Why it is important ?

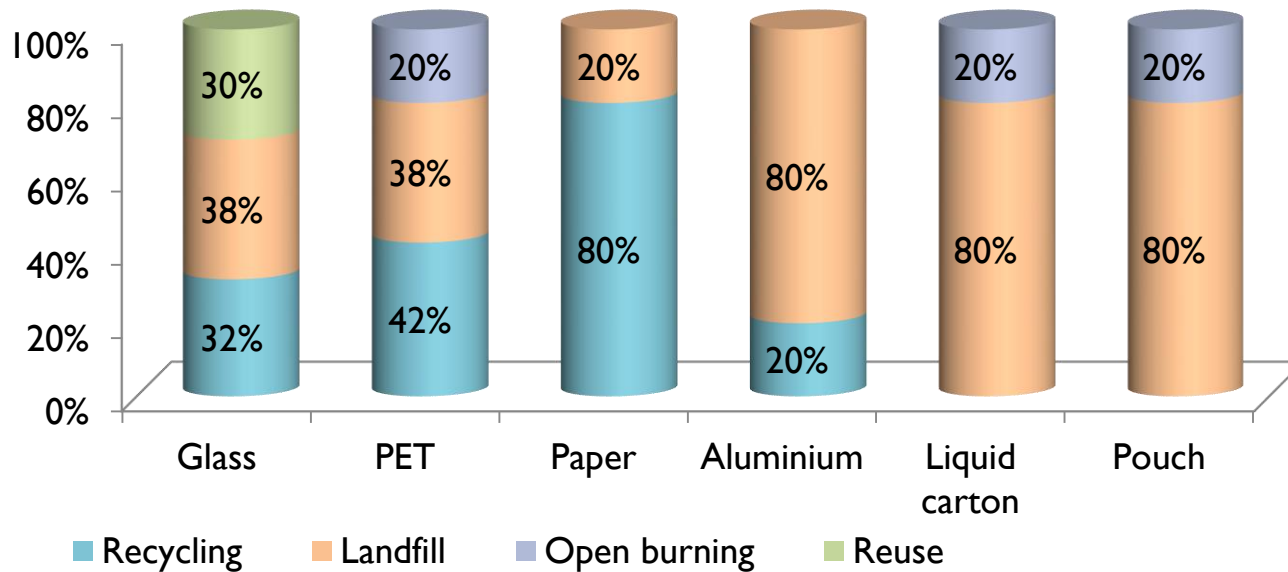
- ✓ AIGMF commissioned the study to establish a clear understanding of the environmental impact of container glass at all stages of the life cycle.
- ✓ The study will also help glass manufacturers to identify and investigate potential improvement opportunities for container glass packaging.

**The study was conducted on Cradle – to – Cradle approach which is the ultimate test in assessing the environmental impact of a product because it ensures that all aspects of a product's life, end-of-life and reincarnation are accounted for.**

## Methodology

- ✓ Data collected on Upstream processing , Transportation, Production & end-of-life disposal.
- ✓ Site visits done for 24 sites of various member companies of AIGMF.
- ✓ The LCA model was created using the GaBi 5 Software system for life cycle engineering, developed by PE International AG. The GaBi database provides the life cycle inventory data for several of the raw and process materials obtained from the upstream system.

# LCA Study on container glass in India – key findings

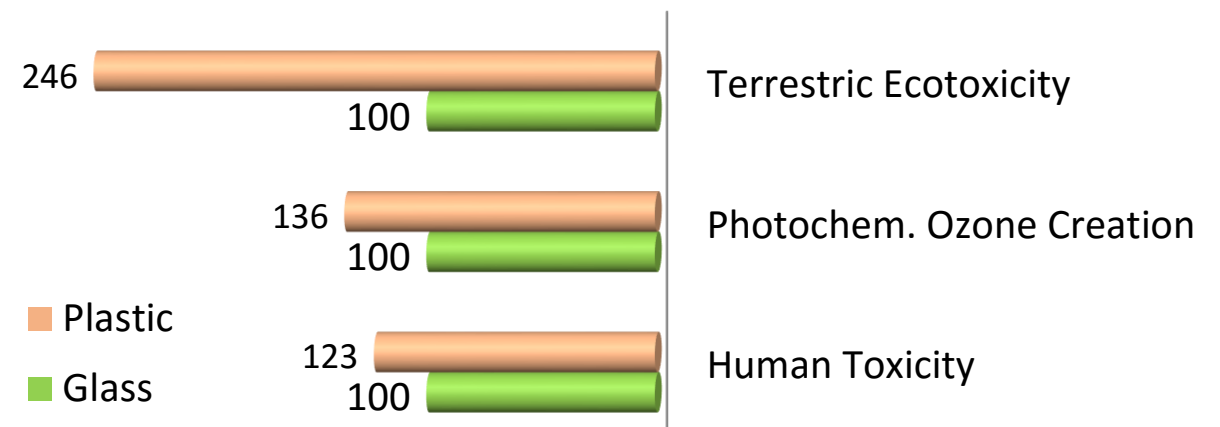


## End of life for packaging mediums

- ☐ In India, only glass is being reused ( 30% ).
- ☐ Very high landfill rate (80%) for Aluminium , Liquid carton board & pouch.
- ☐ Significant open burning for used materials in case of PET, Liquid carton & pouch leading to environment pollution & health hazard.

## Glass vis-à-vis Plastic

- ☐ Glass is by far the most eco-friendly material while packaging is concerned
- ☐ Shelf-life of Food & Beverages with glass container is much more than other packaging mediums



# LCA Study on container glass in India – Key Findings

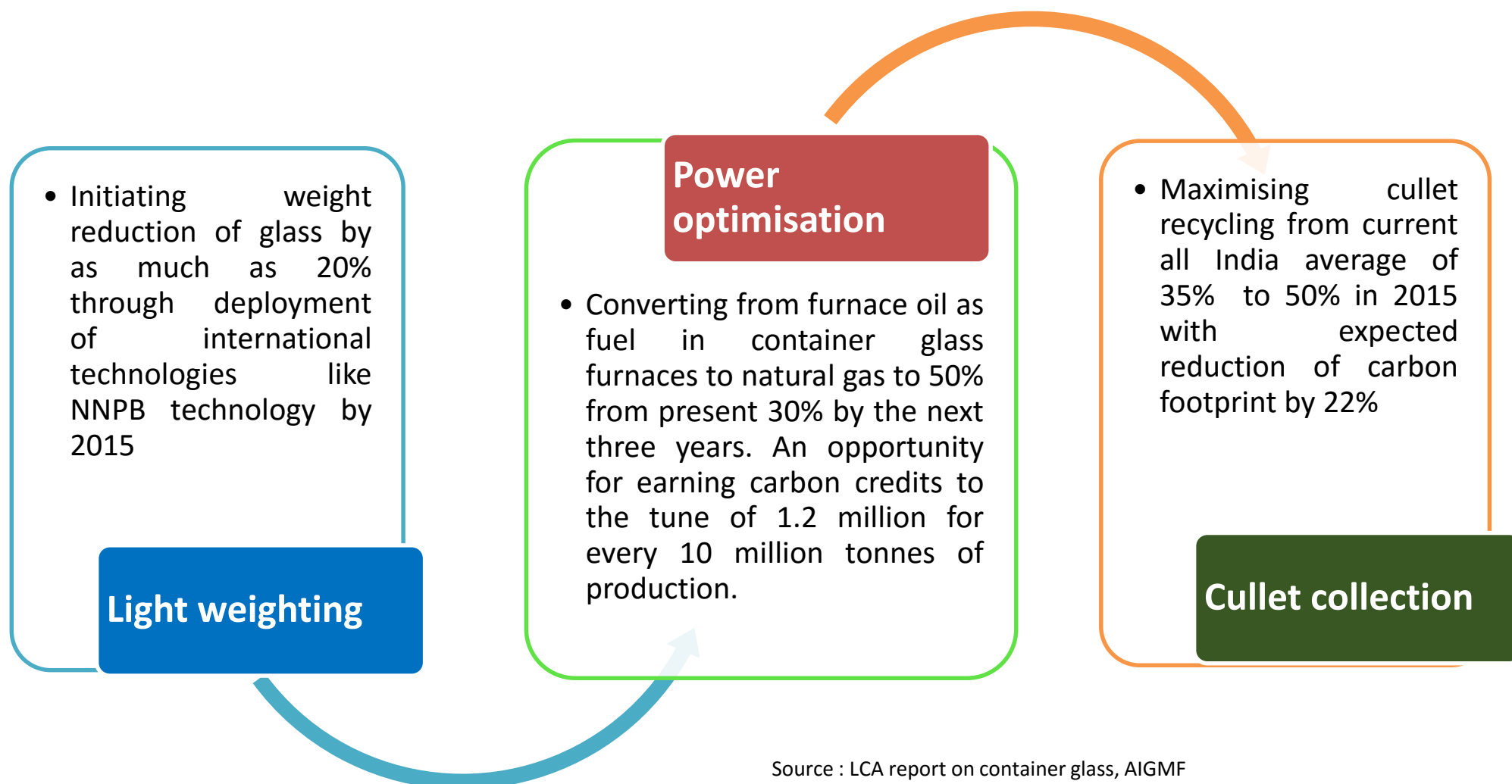
## Effect of weight reduction & recycling on environmental profile of glass

CML2001 - Nov. 2010	Weight reduction (-20%)	Recycling (75%)	Weight reduction (-20%) & Recycling (75%)
Acidification	18%	40%	45%
Eutrophication	17%	37%	44%
Global Warming	18%	39%	50%
Human Toxicity	15%	15%	27%
Terrestrial Ecotoxicity	17%	35%	52%
Photochem. Ozone Creation	18%	43%	45%
Primary energy demand from ren. and non ren. resources	16%	31%	41%

**With increased recycling & reduced weight, environmental effects of glass can be reduced by 50%.**

# LCA Study on container glass in India – Recommendations

Glass manufacturers to lower environmental effects of glass to establish glass' green edge over other packaging mediums on human and environment impact parameters through.....



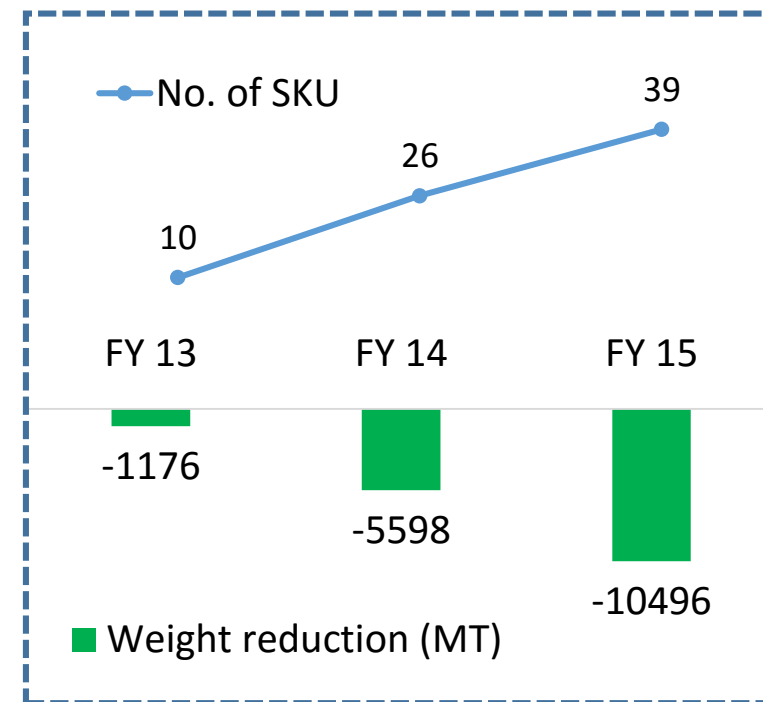
# Light Weighting in FY 15-16

## Illustration

Customer	Product Description	Old Weight (gm)	Light Weight (gm)	Reduction	Potential (Million Bottles)	Status
Bajaj	100 ML FLINT ADHO L/W BTL	140	130	7%	40	Done
USL	750 ml McD L/W	540	505	6%	12	Done
ABD	375ml OC BLUE LW	280	265	5%	7	Done
Radico	180ml OAB_L/W	165	150	9%	30	Done
Pernod Richard	375 ml RS BOTTLE-New Design	300	280	7%	4	Done

Customer	Product Description	Old Weight (gm)	Light Weight (gm)	Reduction	Potential (Million Bottles)	Status
USL	180 ml Ramanova L/W	180	140	22%	9	In Progress
USL	750 ML GILBEY L/W BOTTLE	530	475	10%	3	In Progress
General	180ml FLAT SLW	105	100	5%	6	In Progress
USL	180ml MCD NO1 whisky - ND LW	195	175	10%	17	In Progress

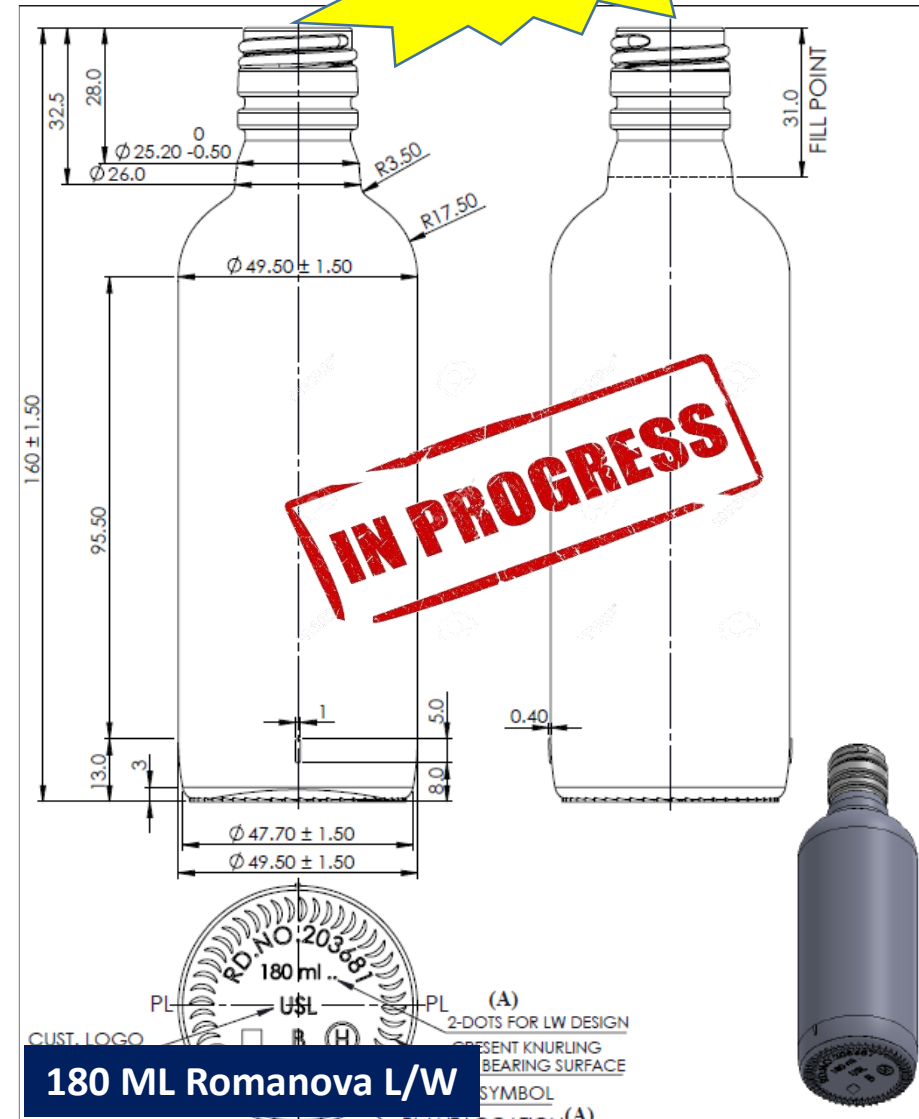
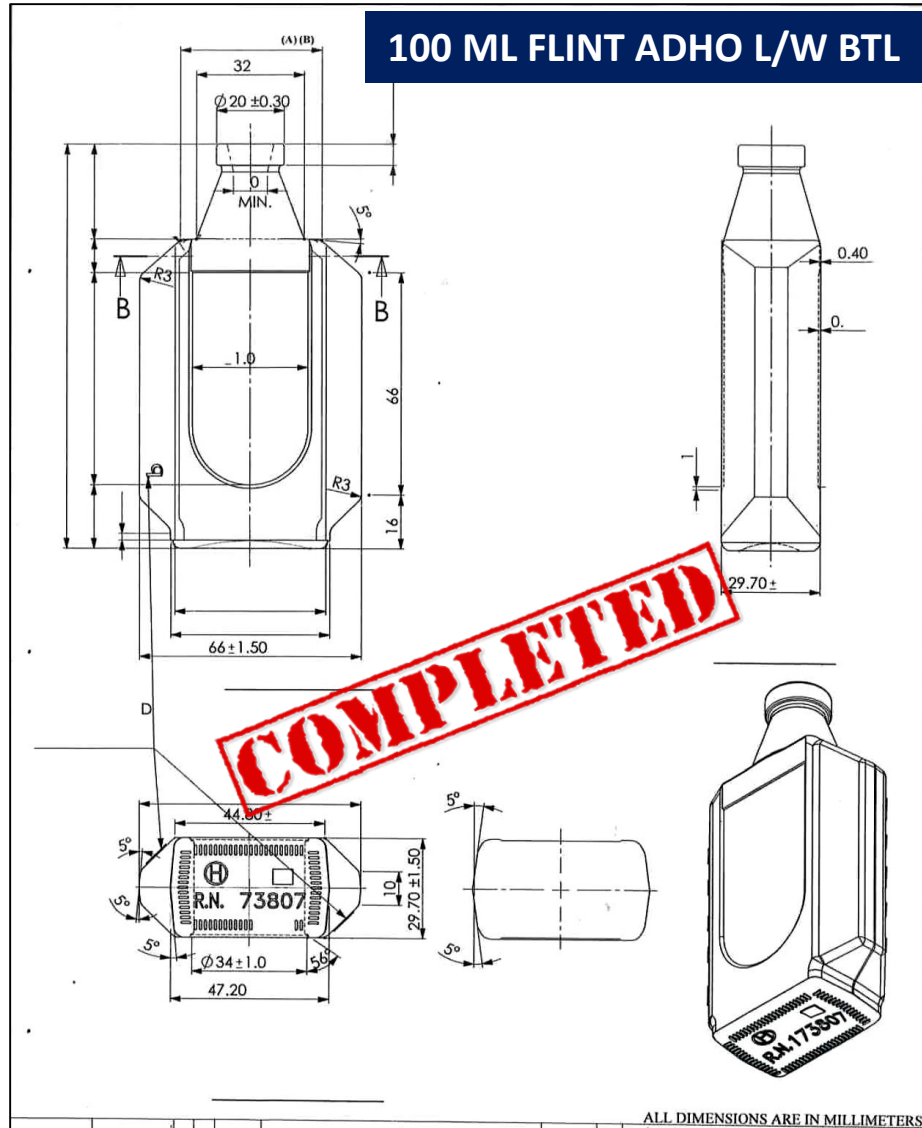
## Light weighting increasing every year



**In FY 15, 10% weight reduction was achieved**

# Light Weighting in FY 15-16

Illustration



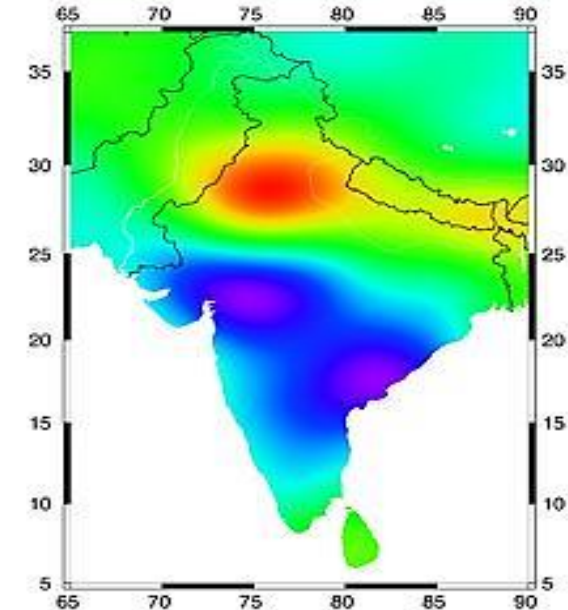
# Water footprint – Glass has minimal impact

**Freshwater is a scarce resource; its annual availability is limited and demand is growing**

"If measures are not taken to ensure sustainable groundwater usage, consequences for the 114 million residents of India may include a collapse of agricultural output and severe shortages of potable water,"

Matt Rodell, NASA

The map shows groundwater changes in India during 2002-08, with losses in red and gains in blue. The estimated rate of depletion of groundwater in northwestern India is 4.0 centimeters of water per year



Source: NASA



**PET**

- It takes anywhere between 1 to 2 liters to manufacture a 500ml PET bottle

**Tetrapack**

- The water footprint for a 500ml Tetra Pak carton stands at 200 ml of water

**Glass**

- 500 ml glass bottle will have water footprint of approx. 127 ml

Source: [www.theguardian.com/sustainable-business](http://www.theguardian.com/sustainable-business)

# Meeting MNC customers' expectations



## CDP

### Carbon Disclosure Project

- CDP is an international not-for-profit organization providing the only global environmental disclosure system.
- This enables investors, companies and governments to mitigate risks from the use of energy and natural resources and identify opportunities from taking a responsible approach to the environment.
- This provides a platform for a responding company to demonstrate their current actions and achievements and is also a means to spotlight any future plans.

## SGP

### Supplier Guidance Principle

- Communicate values and expectations of suppliers and emphasize the importance of responsible workplace practices that respect human rights and comply, at a minimum, with applicable environmental and local labor laws and core international conventions.

## Sedex

- An innovative and effective supply chain management solution, helping to reduce risk, protect company reputation and improve supply chain practices.

## Weight reduction

NNPB technology enables Glass Containers to be 25% lighter and thinner.

The Glass Containers made through NNPB Technology have the same strength as compared to containers made through B&B and P&B.

**Need to educate the users & customers**

## Strength increase

Can thermal tempering process , as followed for toughened glass, be applied to glass bottles ?

Can better coatings & chemicals be applied to improve strength of the bottle ?

**Need more research & investment in bringing new technologies**

**Glass is not old fashioned**

**Address value for money  
through sizing and multipacks**

**Change perception**

**Increase consumption  
occasions with smaller sizes**

**Make benefits of glass more  
known to the public**

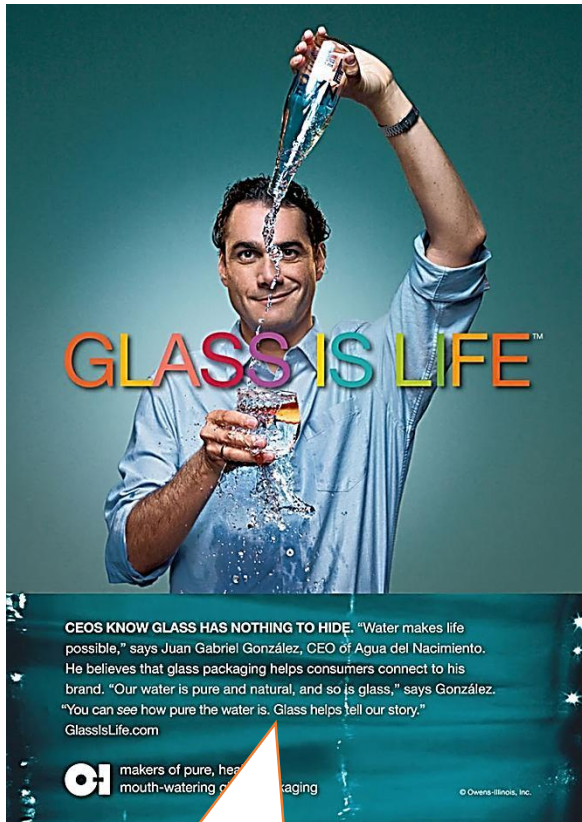
**Be progressive & imaginative**

**The glass industry still has  
“room for improvement”**

**Raise green profile with light  
weighting and  
communication**

**It is about us – it is about glass**

# Glass is life



**"Water is pure and natural, and so is glass"**  
- CEO, aguadelnacimiento



**"Glass is clear, natural & it feels honest"**  
- Co-founder, True Fruits



**"Glass is essential to ensure the unique characteristics of Jack Daniel's"**  
- Master Distiller, Jack Daniel Distillery

Thank you

