



PAPERBOARDS
AND
SPECIALTY
PAPERS DIVISION

Packaging Innovations at ITC PSPD

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Flow of Presentation

- Packaging Influencers
- Sustainable Packaging
- Paper & Paperboard: A Sustainable Packaging Medium
- Packaging Innovations at ITC PSPD
 - Process Innovations
 - Product Innovations
 - Pixel Innovations

Changing Demographics - Old, Urban and Middle

- Changing cognitive and physical abilities will put new demands on packaging usability

E-tailing

- Leading to a renewed interest in secondary packaging as well as an increased demand for standard pack sizes
- The packaging being the part of the experience will mean that it is as important for e-commerce as it is for the shelf

Intense Innovation– Legislative Hurdles

- National and global environmental legislations are getting stricter
- Intra industry cooperation and stakeholder dialogue will play an essential part in the future to ensure new (legislation–conforming) innovations in the packaging market

Proud Packaging

- Today, some of the consumers are likely to view packaging as a necessary waste rather than as a solution as it is a highly visible contributor to household waste volumes
- As packaging becomes more intelligent and recyclable, its perception can be improved considerably going forward

7 Forces Influencing Packaging

Lean, Green and Convenient

- Light-weighting, sustainable raw materials and ease of use packaging on the go whilst ensuring freshness

Increasing raw material prices and the value of recyclable packaging

- The value of packaging will increasingly focus on the raw materials they contain and its recyclability
- Role of recyclers and retailers in the value chain is increasingly becoming more important

Sustainability

- Focus on overall sustainability of packaging will continue to grow

Sustainable Packaging: Goals

Social Responsibility

- Community health & well being, rights of the indigenous people

Performance & Cost

- Cost optimization without compromising on functional properties

Renewable Materials

- Trees, Bio-Plastic

Effective Recovery

- Reduce, Recycle, Reuse

Optimize Materials

- Rightsizing, Light-weighting etc.

Renewable Energy

- Wind, Solar & Hydro

Clean Production

- Emission Reduction, Water recovery, Effluent discharge

Material Health

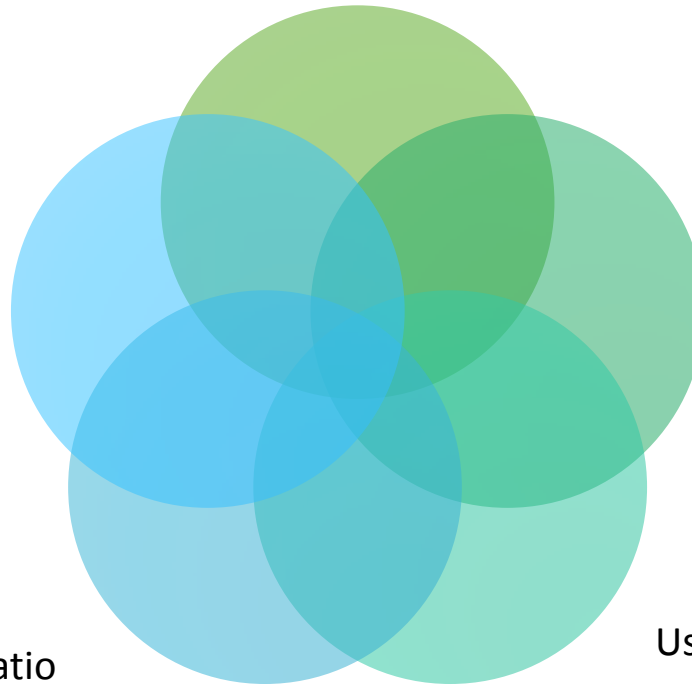
- Inks, Heavy metals etc.

Sustainable Packaging: By Design

Consider the product/brand's impact on the entire supply-chain: from supplier to distribution to retail customer

Logistics efficiency in complete life cycle – cube utilization, tare weight, enablement of efficient transportation and storage

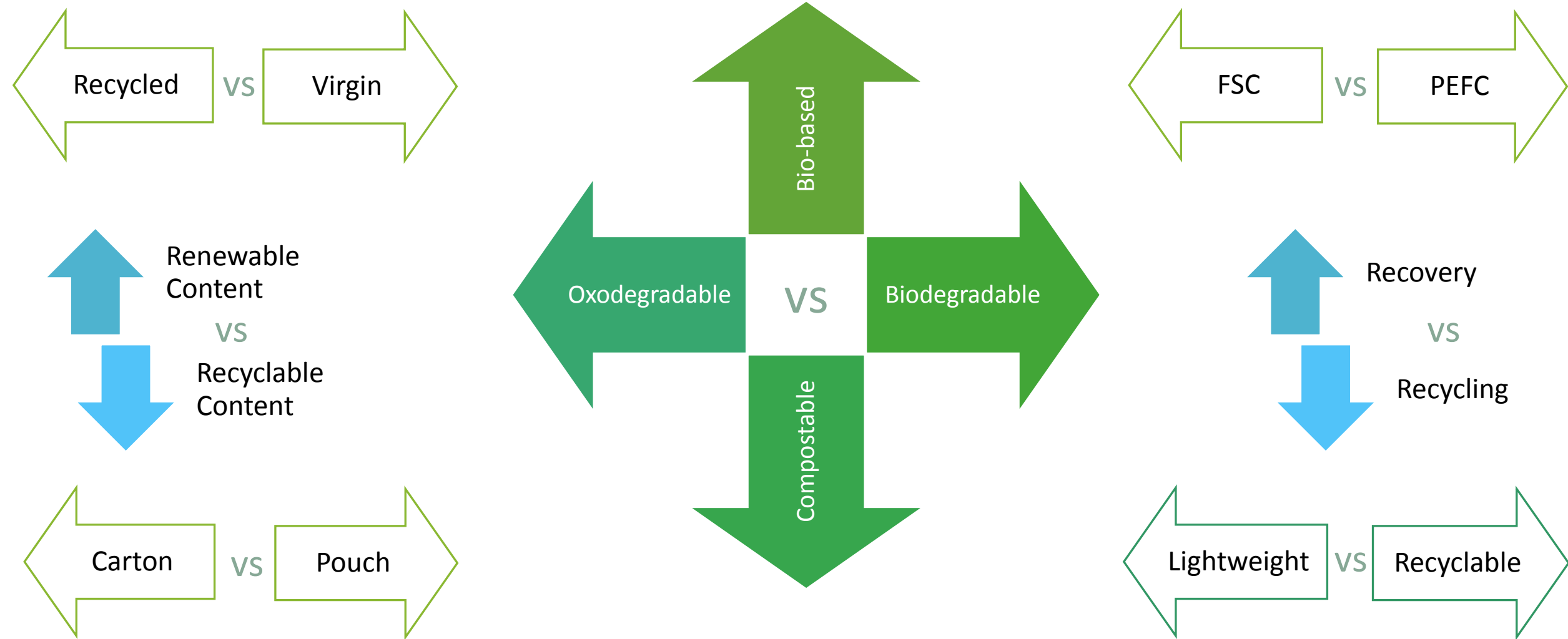
Assess options for structural design, material & process improvement, Optimized headspace, Product densification, shelf-life optimization



Product – Packaging ratio

Use of minimal materials – reduced packaging, reduced layers of packaging, lower mass, lower volume

Sustainable Packaging: Making Choices... Never Easy



Paper & Paperboard: A Sustainable Packaging Medium

Sustainable &
Renewable Raw
Materials

Resource Efficiency
& Lowering
impacts

Light-weighting

Improved
Durability & Shelf-
life

Reducing &
Eliminating the
use of Hazardous
Materials

Designing products
that are easier to
Recycle

Supporting Waste
Segregation by
Consumers &
Collection

Engineered Paper
and Paperboards

Confluence –
Newer barriers
through Water-
based Coatings

Emerging – Newer
barriers through
Plant-based
Polymers



Packaging Innovations at ITC PSPD



Process Innovations

Sustainable & Renewable Raw Materials

1,95,000

hectares of land greened by **ITC PSPD's Social and Farm Forestry** initiative (as of June, 2015), driven by an extensive research based **clonal propagation programme**, generating nearly

90 million person-days of employment

In order to ensure food and wood security, ITC PSPD has developed an

Agro-Forestry Model

Where agricultural crops are grown along with pulp species like Eucalyptus and Subabul. This model encourages plantations through small farmers in their private wastelands generating significant livelihood and natural capital

All **4** units of ITC PSPD are

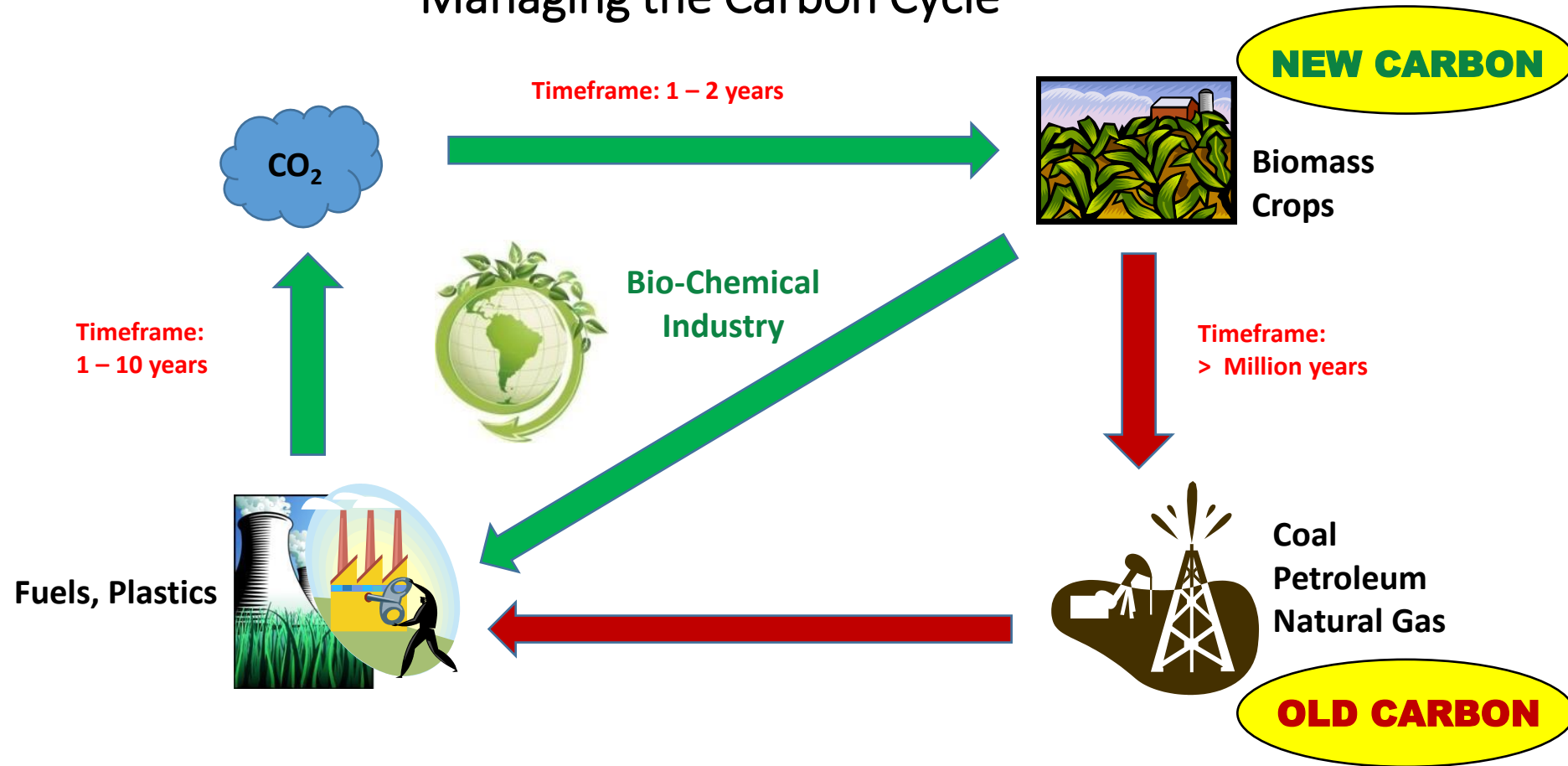


-CoC

Certified

Sustainable & Renewable Raw Materials

Managing the Carbon Cycle



NEW (Renewable) Carbon Feedstock
vs.
OLD (Petroleum) Carbon Feedstock

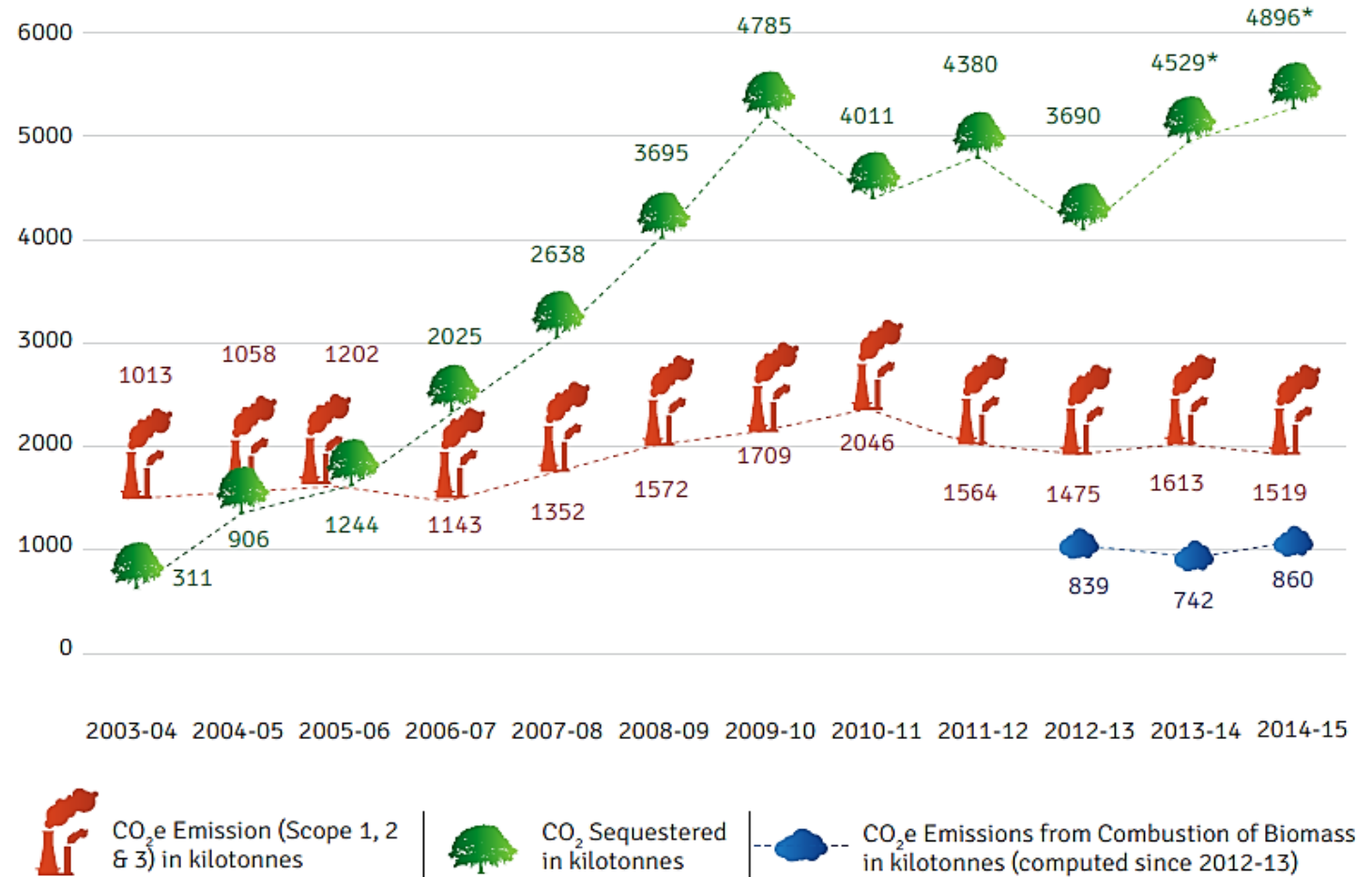


ZERO CARBON FOOTPRINT
Intrinsic “Value Proposition”
for Biobased plastics

Sustainable & Renewable Raw Materials

In 2014-15 ITC-PSPD plantations helped in sequestering 4896 kilotons of CO₂ as against overall ITC's emission of 2379 kilotons thereby continuing to contribute to our **Carbon Positive** status for the **10th year in a row**

GHG Emissions and CO₂ Sequestration



INNOVATION: Forestry Models that sequester more carbon than is released into the atmosphere

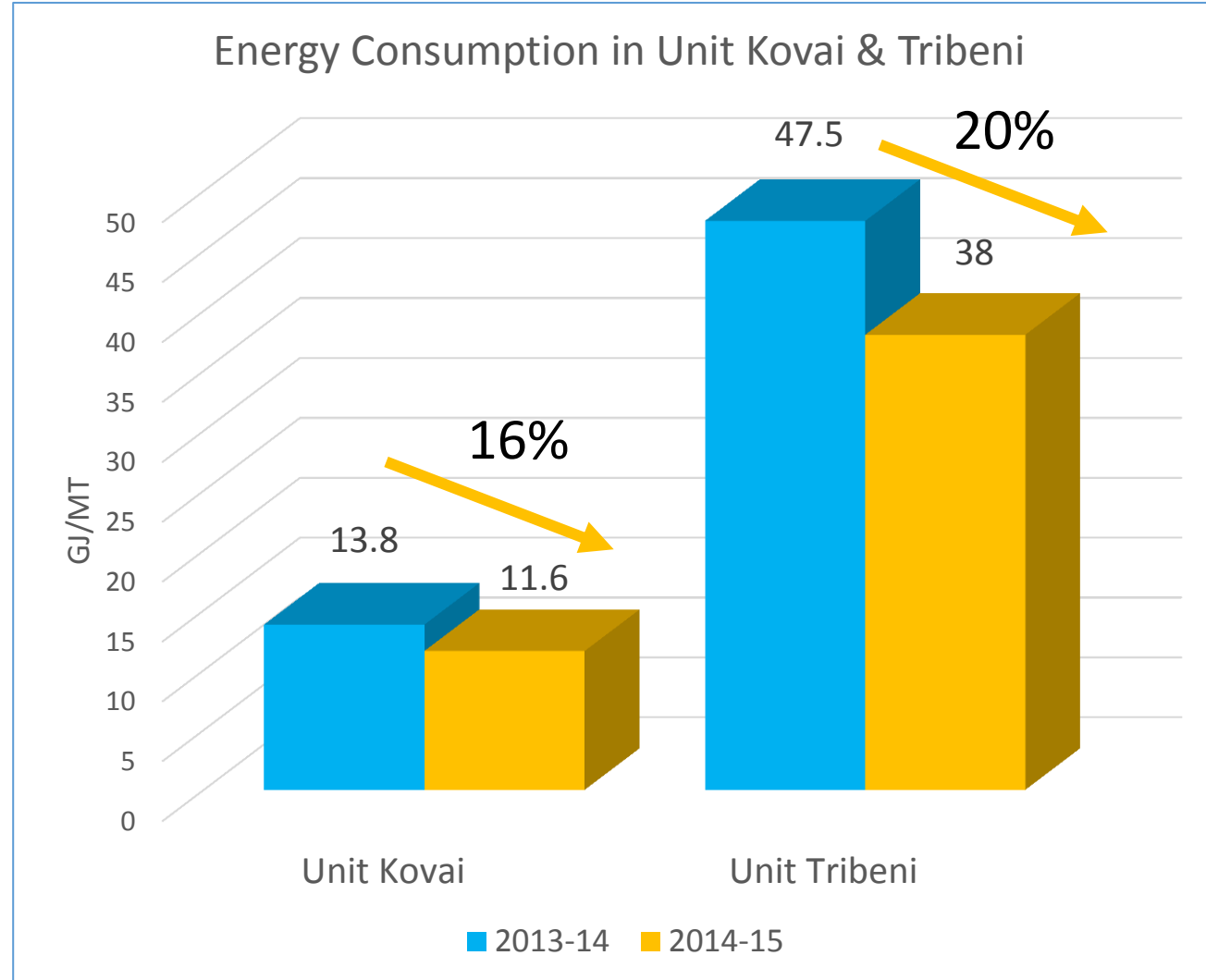
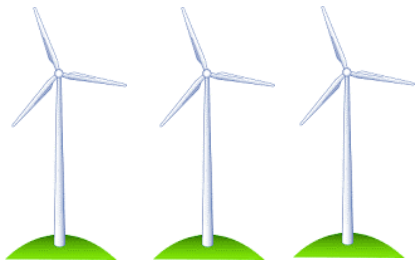
Energy Efficiency

45%

Share of Renewable Energy in ITC PSPD's total energy consumption in 2014-15

130_{MW}

ITC's total installed capacity of wind energy with an investment of nearly Rs. 800 crore



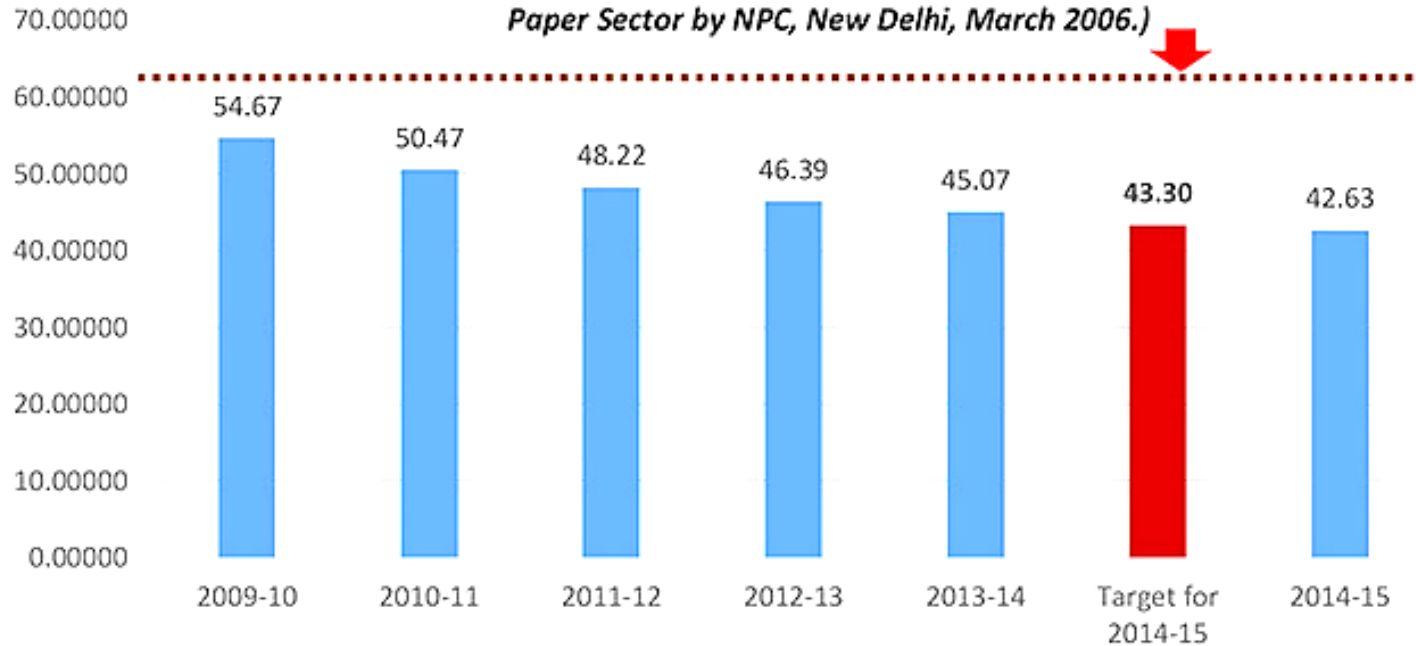
ITC PSPD's Renewable energy comes from

- Bark, lops, tops collected at the harvest site of plantations
- Chipper dust from wood
- Black liquor waste from pulping process
- De-oiled bran (used as boiler fuel)
- Wind Energy Farms

INNOVATION: Manufacturing waste used as biomass to produce renewable energy, which reduces use of fossil fuels

Water Usage & Effluent Treatment

Unit Bhadrachalam



68%

of treated water discharged outside from Unit Bhadrachalam and Unit Tribeni utilised for irrigation purpose

Specific water intake in ITC PSPD Unit Bhadrachalam reduced by

22%

From 2009-10

0%

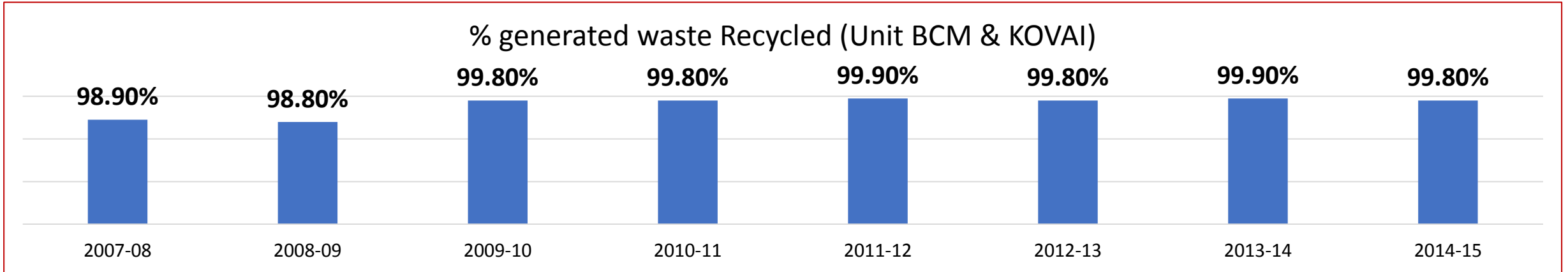
discharge of treated effluent outside premises by Unit Kovai since 2010-11

As on March 31, 2015 ITC's **Integrated Watershed Development Projects**, covering nearly 2,12,000 hectares, support the **Water Positive** status of the Company for the 13th year in a row

INNOVATION: Initiatives to reduce water consumption, increase water harvesting and decrease wastewater effluents

Solid Waste Recycling

Efforts at ITC Units Bhadrachalam and Kovai to recycle the entire waste generated along with utilisation of externally generated waste paper as a source of fibre have helped ITC to maintain its **Solid Waste Recycling Positive** status for the 8th consecutive year



Waste Category	Waste Destination
Fly ash generated from coal-fired boilers	Used by cement and brick manufacturers
Lime sludge	Utilised in-house as well as by external cement manufactures
Wood waste from chipping operation	Used as a fuel in an in-house boiler

INNOVATION: Solid Waste generated as a result of manufacturing reused in the manufacturing process

Supporting Waste Segregation by Consumers & Collection

Paper is 100% recyclable and completely biodegradable (in a composting atmosphere). Disposal happens in 2 ways:

- Landfill (Takes a long time to degrade and releases harmful gases)
- Recover & Recycle (Provides economic benefit)

Objectives

- Create sustainable livelihoods for Swachh Sahayaks (Rag Pickers)
- Helping to create a clean and green environment

Concept

- Bring awareness to all the stakeholders of the society on source segregation by conducting systematic propagation activities
- Facilitate effective collection mechanism of recyclable dry waste
- Manage the post consumer packaging material disposal/recycling

Reach

- Presently covering 300000 households in Bengaluru , Coimbatore and 3 towns in Telangana



26,000

Tons of recyclable waste paper collected during 2013-14 by WOW

INNOVATION: Initiative to improve collection and recycling of paper

Reducing & Eliminating the use of Hazardous Materials

➤ Pulping & Bleaching Process

- Cl – E – H – H to O₂ - ClO₂ - O₃ – H₂O₂ – ClO₂
- Complete elimination of Chlorine and Hypo with ClO₂ and Peroxide bleaching, leading to :
 - Elimination of Dioxins & Furans in the finished product
 - BOD, COD & AOX reduction in effluents meeting international standards
- Onsite/in-process production of ClO₂ than storing them in cylinders



➤ Stock Preparation

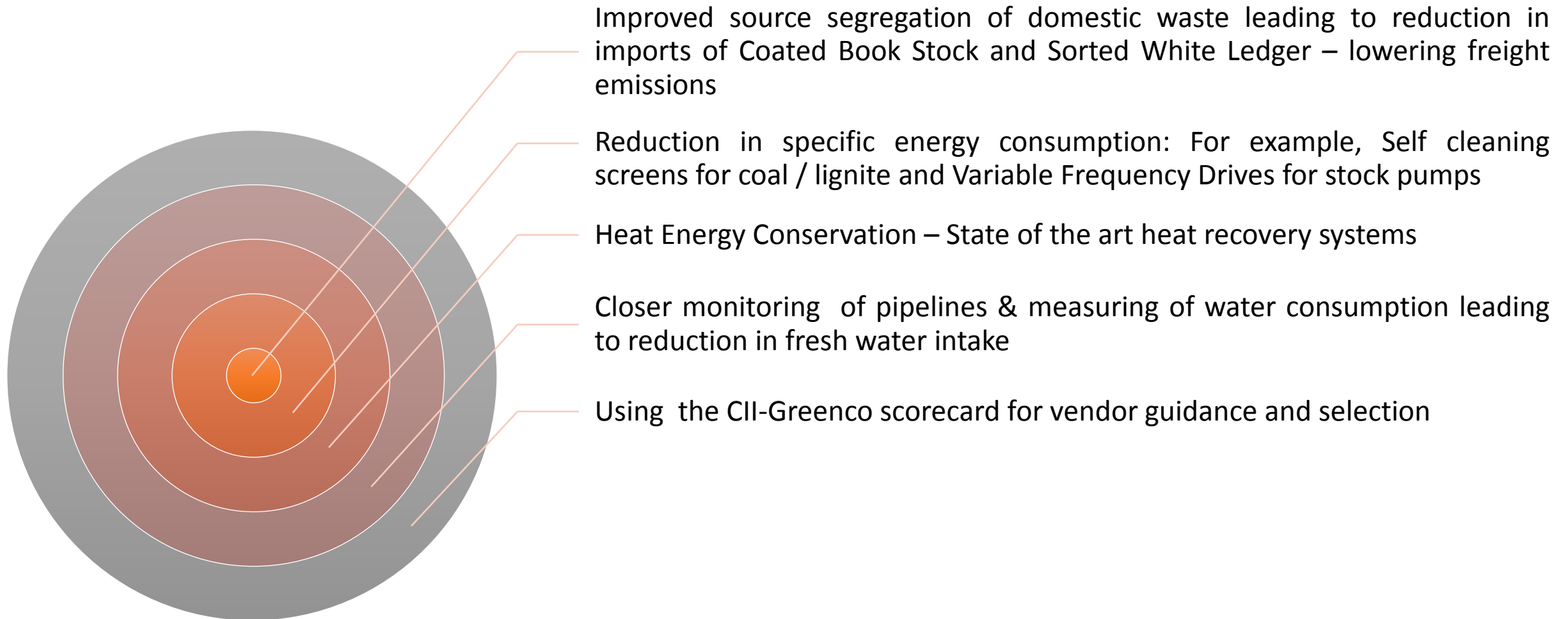
- Hot dispersion process eliminates heavy metals and phthalates in recycled printed material.
- Single component to Multi component retention aids : chemical retention & reduced effluents

➤ Dry end

- Replacement of Urea based OBAs with solvent based FDA approved OBAs - better organoleptic properties
- Elimination of Ammonia in the coating colors
- Removal of Sulphuric Acid in pH control water in Cooling Towers

INNOVATION: Continuously lowering impacts by using newer process and specialty chemicals and also increasing recyclability

Environmental Impact Reduction based on LCA



INNOVATION: Using LCA to identify 'hotspots' in the entire life-cycle of the product and working to mitigate them



Product Innovations

Light-Weighting

Pharma Cartons

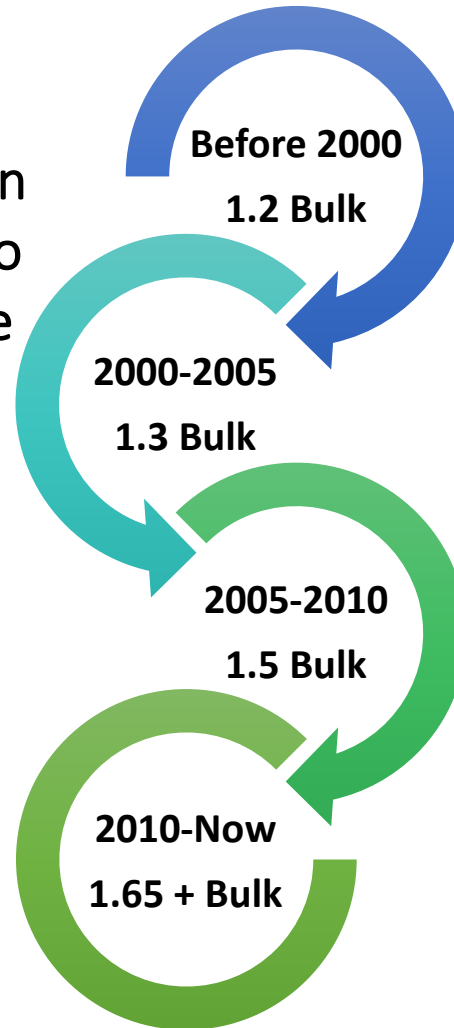


Shipper Cartons

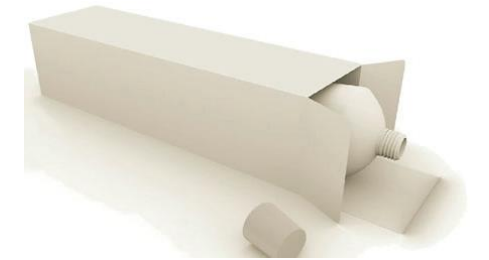


Adapted from ICCA

ITC PSPD:
Improvement in Bulk from GB to FBB, paving the way for source reduction



Light-weighting in Toothpaste Cartons



SKU	SUBSTANCE REDUCTION (ACROSS 5 YEARS)
Small	12%
Mid	16%
Large	13%

INNOVATION: Strong focus on improving yield for packaging; Delivering stiffness instead of GSM

Case Study: Source Reduction *Canister for Bottles*

Indo|barr|r

Engineered for frozen foods

- **Customer Need:** Brand distinction; Reduce packaging material – source reduction
- **Old Packaging:** Cartons
- **Solution:** Indobarr Canisters
 - Better graphic reproduction
 - Better shelf appeal
 - Suitably designed paperboard for strength, sealing and forming properties
 - Light-weighting

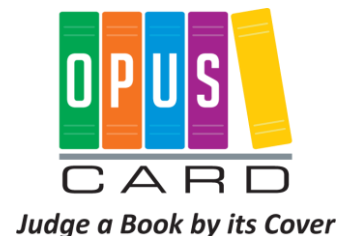


Case Study: Source Reduction - *Nanobev*

- **Customer Need:** Cups for small volumes ~ 65 ml
- **Old Packaging:** Cupstock with higher GSM board and PE coating
- **Solution:** Nanobev
 - Light-weighting - Reduced paperboard GSM to 165
 - More environment-friendly - Reduced PE coating from 15 to 12 GSM



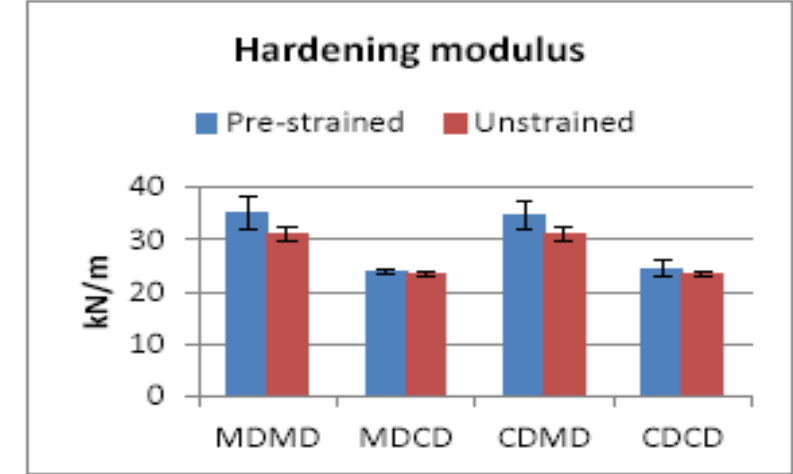
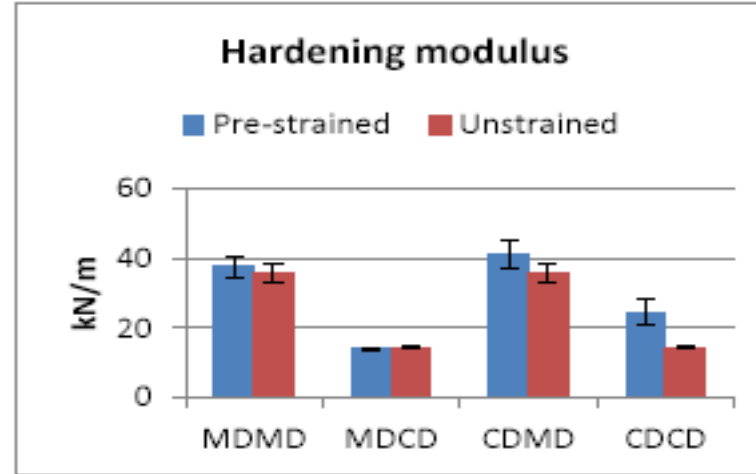
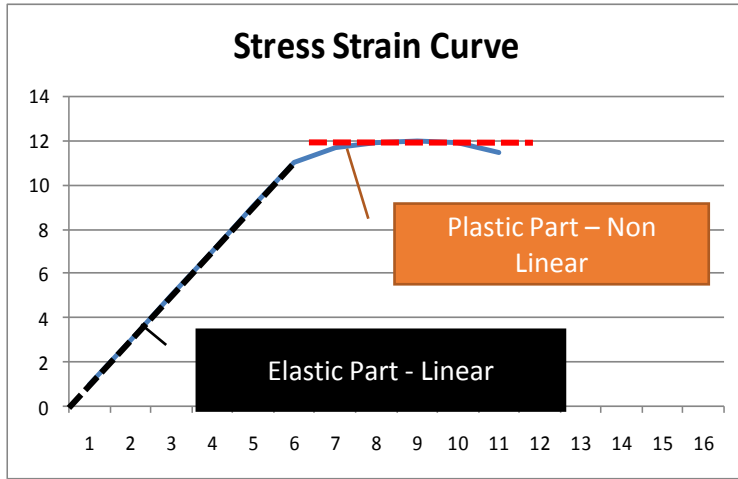
Case Study: Source Reduction - *Opus Card*



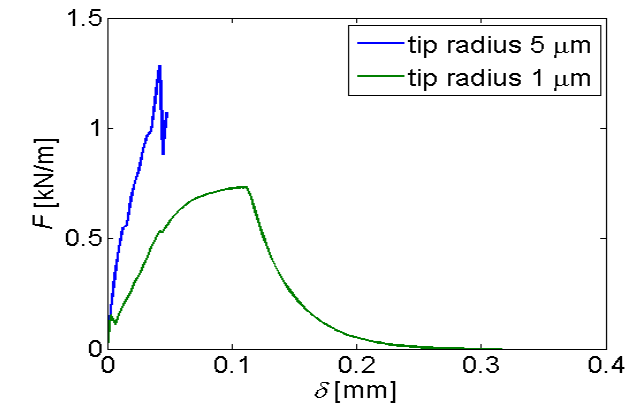
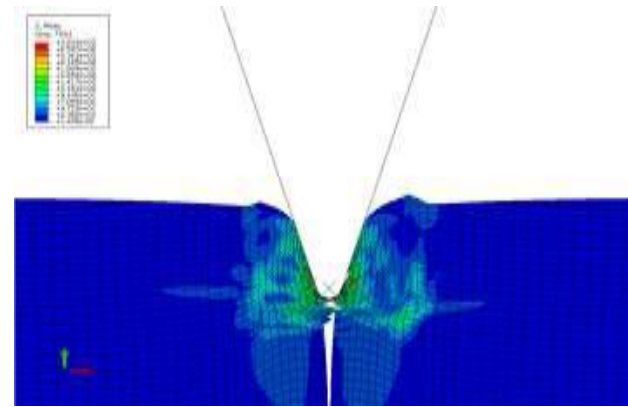
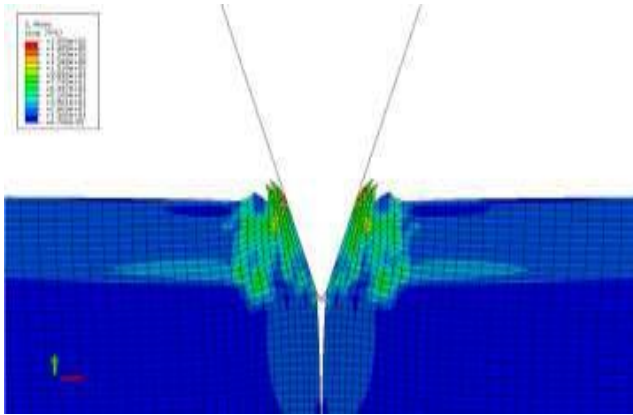
- **Customer Need:** Paperboard for Book Covers; Reduce packaging material
- **Old Packaging:** Paperboard with higher GSM to achieve required strength properties
- **Solution:** Opus Card
 - Light-weighting - Reduced paperboard GSM
 - Durable – Optimum folding endurance even at lower GSMs
 - Aesthetics – Better graphic reproduction

Engineered Paper & Paperboards

Mis-register: Difference in hardening modulus values between two paperboard samples



*Die-cutting – Tool tip with a larger radius distributes energy over larger area.
Configuring internal fracture and delamination of paperboard based on the finishing process*



INNOVATION: Product Engineering for continuous improvements

Improved Durability and Shelf-life

Residual Lignin

- Oxytrac pulping eliminates any residual lignin in the pulp

pH of the paper

- Advancement in Sizing Technology
- Conventional Rosin Sizing (5 pH) to ASA /Cationic Rosin (6.8 pH)

Light fastness of Dyes and OBAs

- Shift from Basic Dyes to Pigmented dyes
- Process and dosage changes

INNOVATION: Performance improvement by using new-gen process and inputs, increasing packaging shelf-life

Case Study: Designing Eco-friendly Products



For Display Packaging

- NeoWhite Bliss is a high performance board made out of *recovered fiber* which delivers on both aesthetics and performance parameters
- Pre-consumer paperboard waste from Unit Bollaram is recovered and sent to Unit Kovai where the *PE coating is separated from the paperboard* using state-of-the-art technology, to manufacture a new product – NeoWhite Bliss
- It is endowed with attributes like excellent fiber tear which make it suitable for *Blister card packaging*
- The product also allows for replacement of traditional solvent-based heat seal lacquers to more *eco-friendly water-based heat seal lacquers*
- It accounts for about *20% reduction in GSM* compared to recycled boards
- It has also helped *replace the traditionally used PVC cap in blisters with PET caps*



INNOVATION: Use of recovered fiber to manufacture eco-friendly paperboard for packaging

Case Study: Designing Eco-friendly Products

Antifungal Board for Soap Cartons

- Replaces PE coating with fungicide coating which protects the soap from fungal growth due to moisture and helps retain its freshness
- Completely eliminates the need for inside pouch and can be used in direct contact with soap - saving both money and time taken on filling lines
- The fungicide chemical is completely safe for skin contact



Developments in Food Packaging Products



Paperboards with emulsion coatings / PLA
- Fully Biodegradable under composting conditions



Virgin fiber based paperboards with barrier coatings
- Designed for frozen foods and beverage packaging

Virgin fiber based paperboards (free from agents which can migrate into the food product)
- Conforms to global standards



Virgin fiber based paperboards
- Responsibly sourced sustainable fiber
- Smooth runnability on packing lines



Recycled fiber based paperboards



INNOVATION: Use of PLA coating instead of Plastic resulting in more eco-friendly products

Case Study: Designing Customized Products

- For Digital Printing applications
- Sold in cut-to-size sheets of 13 x 19 inches
- Reduces wastage at printer's end
- Better waste management at PSPD



Case Study: Designing Customized Products

- **Nanobev** sold as blanks and bobbins instead of sheets/reels
- Customers are mostly small printers lacking in waste management technology
- Helps the printers and the environment by reducing wastage at printer's end
- Better waste management at PSPD





Pixel Innovation

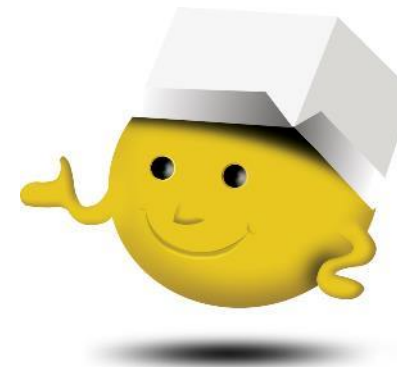
Papyra Mobile App

What does Papyra do?

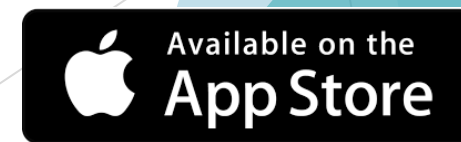
- ▶ Helps you select the right paper/board for your product on the basis of end-use in Packaging, Graphic and Specialty applications
- ▶ Aids in more informed decision-making – whether it is selecting the type of paper/board or determining the required quantity
- ▶ Empowers you with detailed product and technical knowledge at your fingertips
- ▶ Puts you in direct contact with ITC PSPD for any product query

How does Papyra do it?

- ▶ Suggests papers & boards from ITC portfolio by simply selecting the end use segment
- ▶ Helps compare grades based on: 1) Cross Direction Stiffness or 2) Caliper Comparison
- ▶ Grammage Slider - recommends a GSM for each grade based on application and accounts for some source reduction potential
- ▶ Calculates the tonnage (for a chosen GSM & Carton dimension) between different grades with similar functional properties
- ▶ Tech Guru – a complete guide on Paper and board properties and usage
- ▶ Product Specification - download product specifications with a simple click
- ▶ **Contact Section – a dedicated customer experience manager from ITC will reply to any query regarding the App within 24 hours**



To download the App, search for ITC's Papyra on



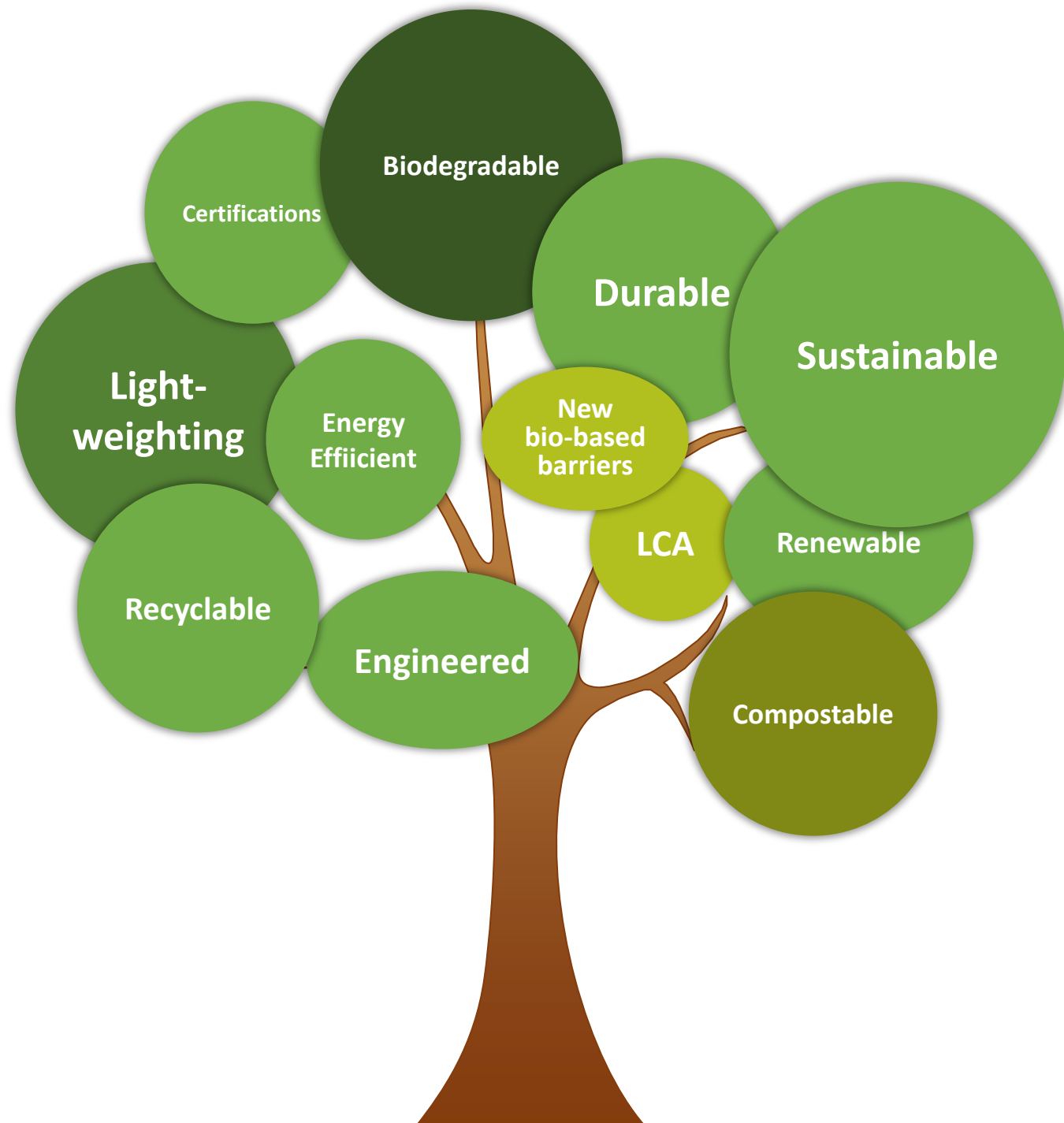
Or visit <http://www.itcpspd.com/papyra/>



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