

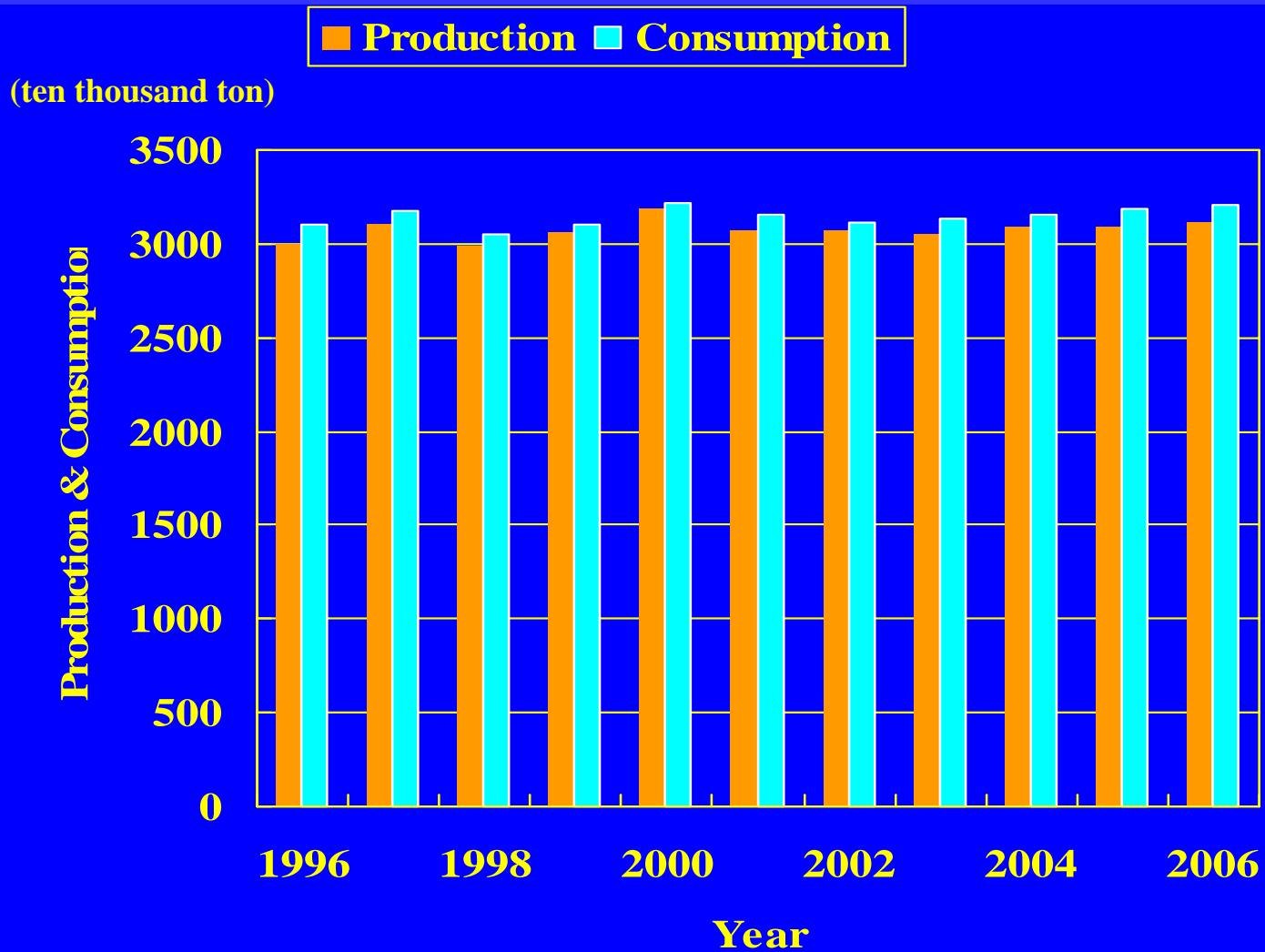
Paper Recycling in Japan

Achievements & Challenges

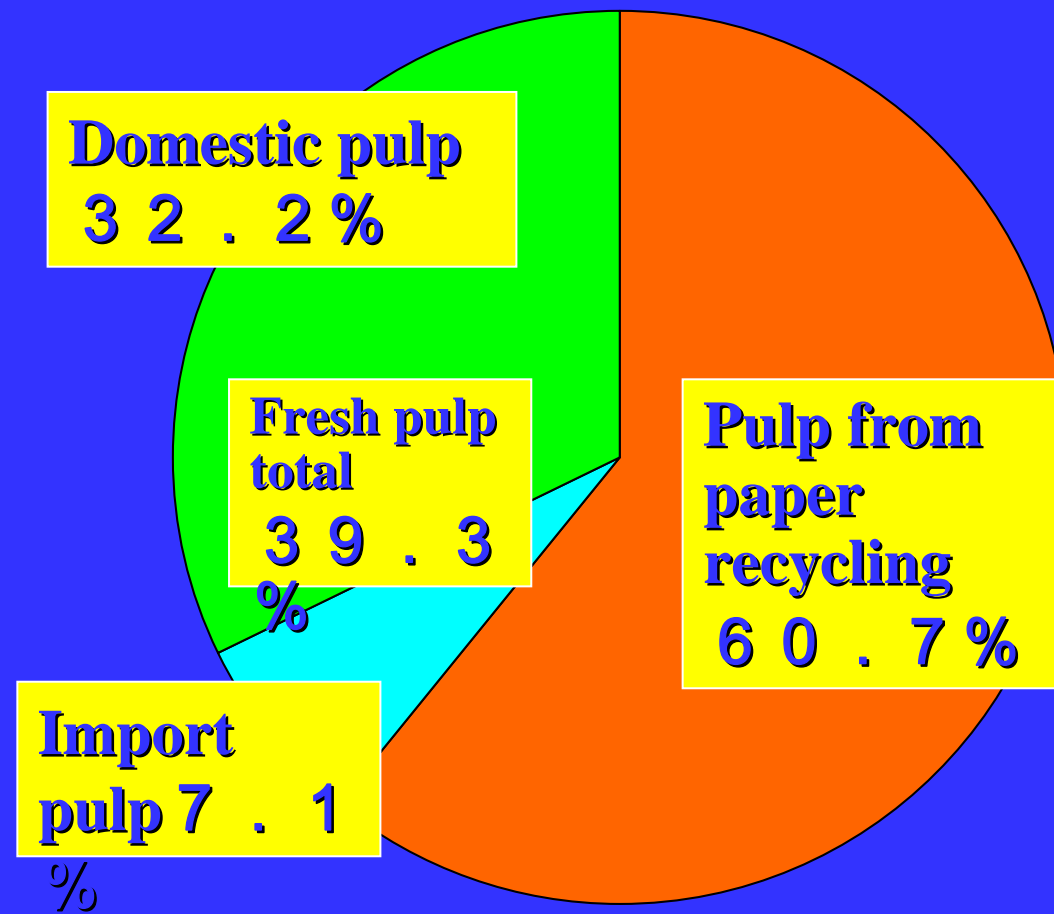


JAPAN TAPPI Kunitaka Toyofuku

Production & Consumption of Paper & Paperboard In Japan



Origins of Pulp in Japan(2006)



Why We Are Promoting Paper Recycling

1. Securing new fiber resource for increasing paper demand

Demand for paper and paperboard is increasing rapidly among the East Asian countries where economic development is remarkable

2. Reducing waste disposal volume

2006y	Domestic paper consumption:	32.1 M tons
	Paper recovered for recycling:	22.8 M tons
	Not recovered:	9.2 M tons

mostly goes to incineration or landfill

Ways to Reduce Waste Volume and to Utilize it as Resources

- **Collaboration among industry, government, and private sector**
- **Constitution of Laws**
 - **Law for the Promotion of Utilization of Recycled Resources**
 - **Containers and Packaging Recycling Law**
 - **Law on Promoting Green Purchasing**
- **Separate collection of waste is a duty of the local governments.**
- **Waste from home is classified at the point of disposal for separate collection as in the next slide.**
- **We believe that separate collection is better than mixed collection**

Garbage Separation in Home



According to Containers and Packaging Recycling Law



Garbage Collection in Supermarket



Collection Station



Pet Bottle



Container Tray



Aluminum Can



Liquid Container



Polystyrene Tray

Unwelcome Impurities in Paper Recycling

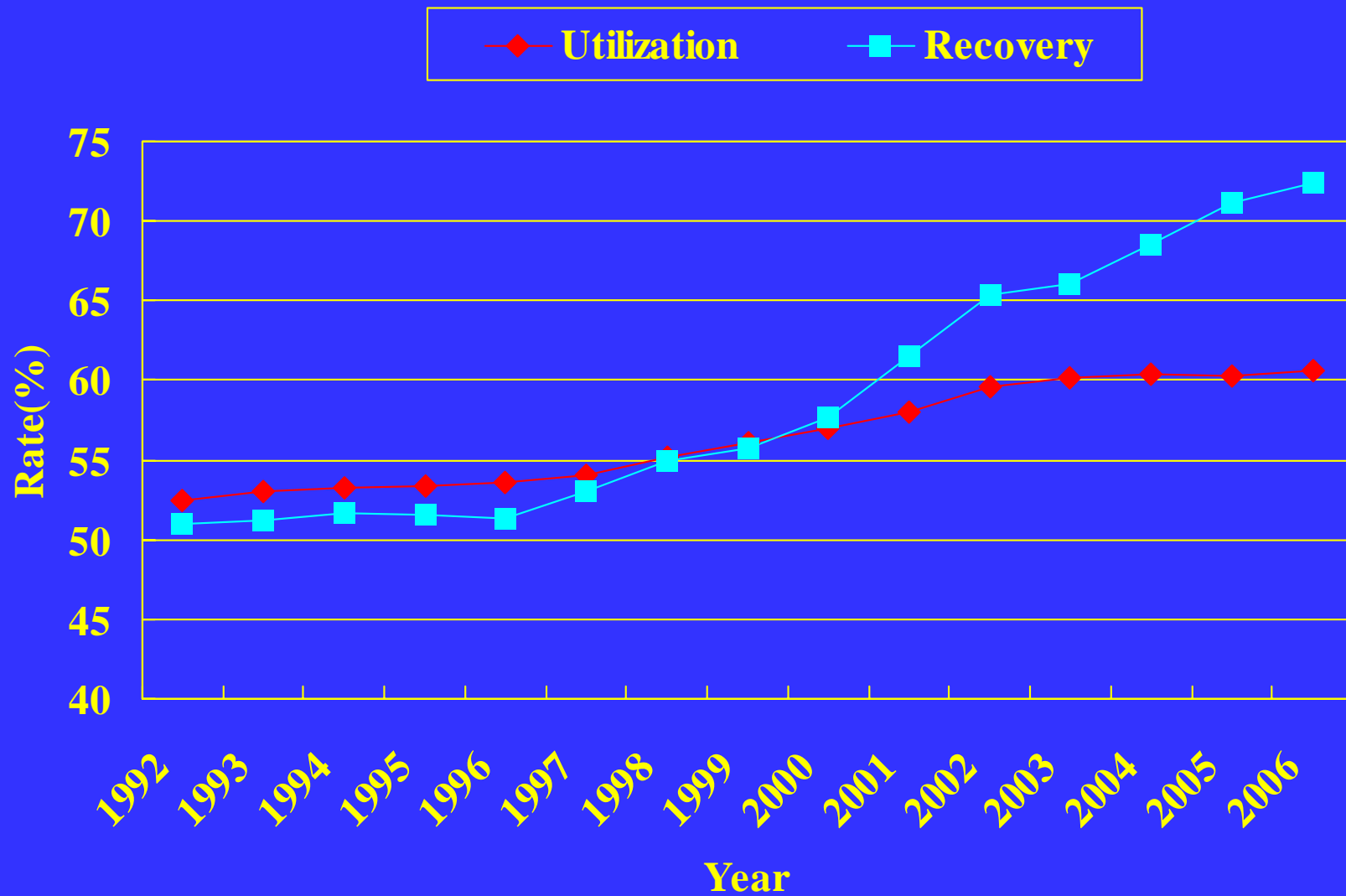
1. Non-paper products

Adhesive tape, Stickers, Metal pieces on folders, Metal clips, Film, Polystyrene foam, Cellophane, Plastic items, Glass items, Cloth, Fragrance

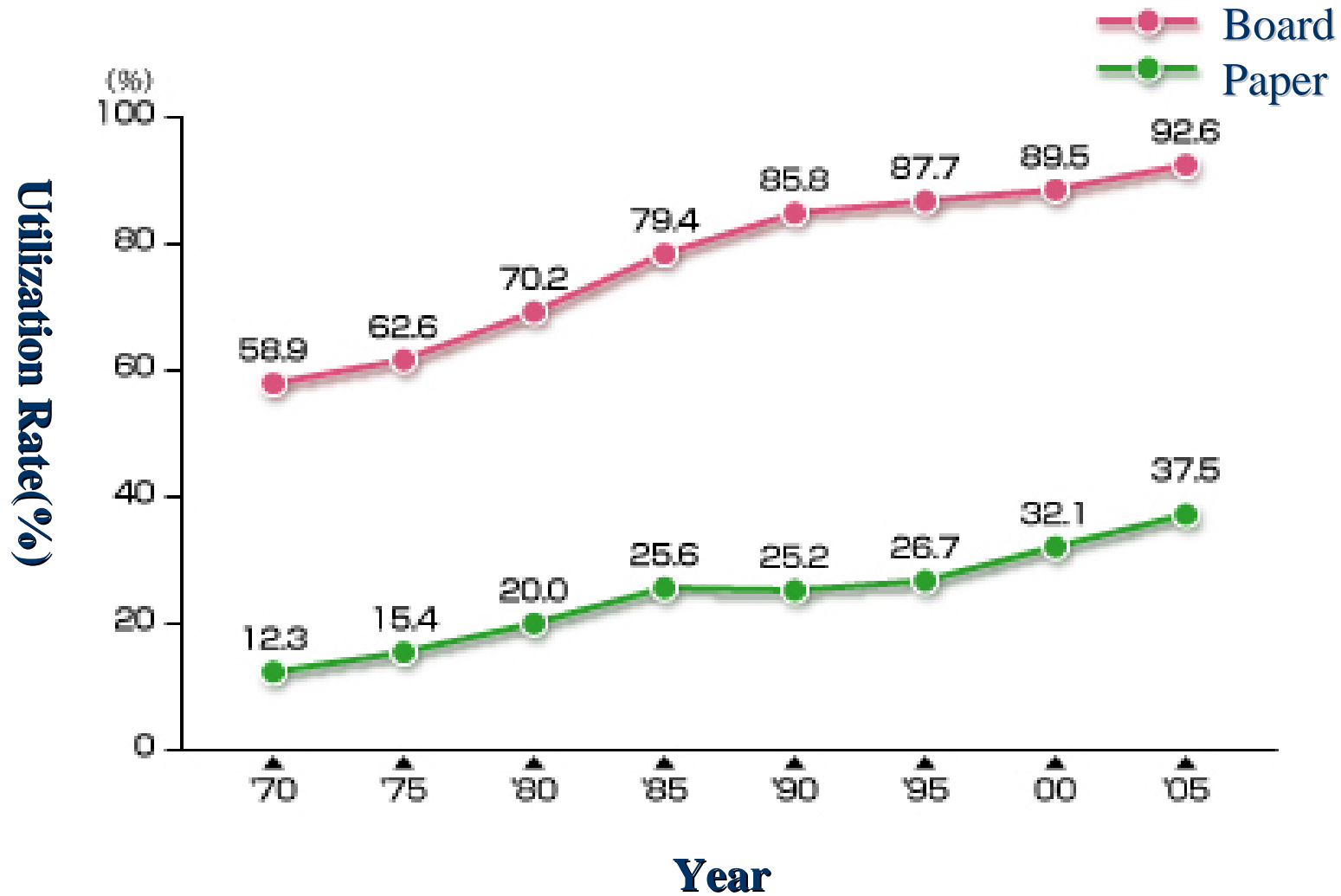
2. Prohibitive paper products

Envelopes with adhered stickers, Plastic-coated paper, Wax paper, Oiled Paper, Photos, Synthetic paper, Processed water-resistant paper, Carbon-backed paper, Carbonless copy paper, Thermal paper (fax paper), Textile printing paper (dye sublimation paper for iron printing etc.), Thermal foaming coated paper

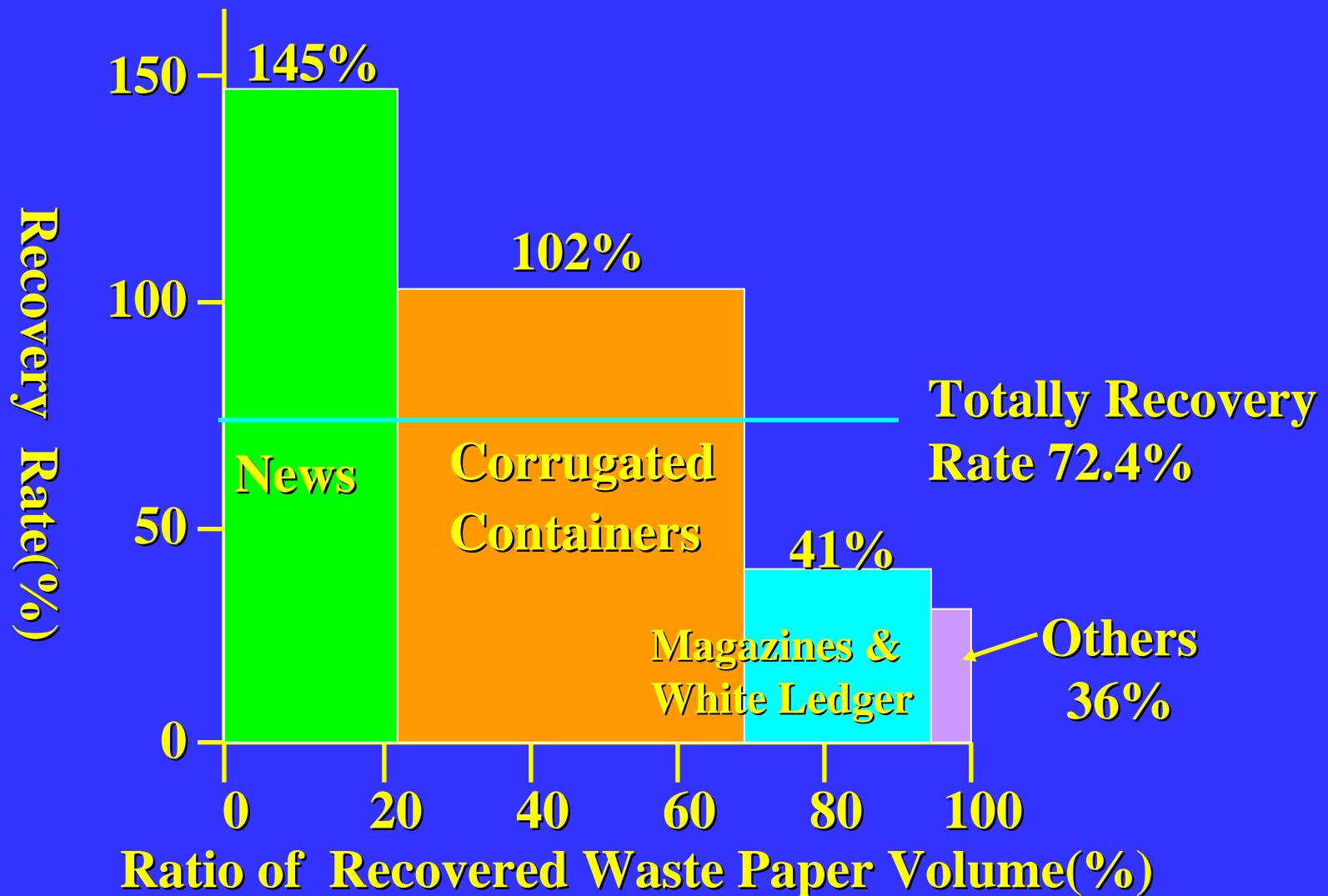
Paper recycling : Change in the rate of Recovery & Utilization



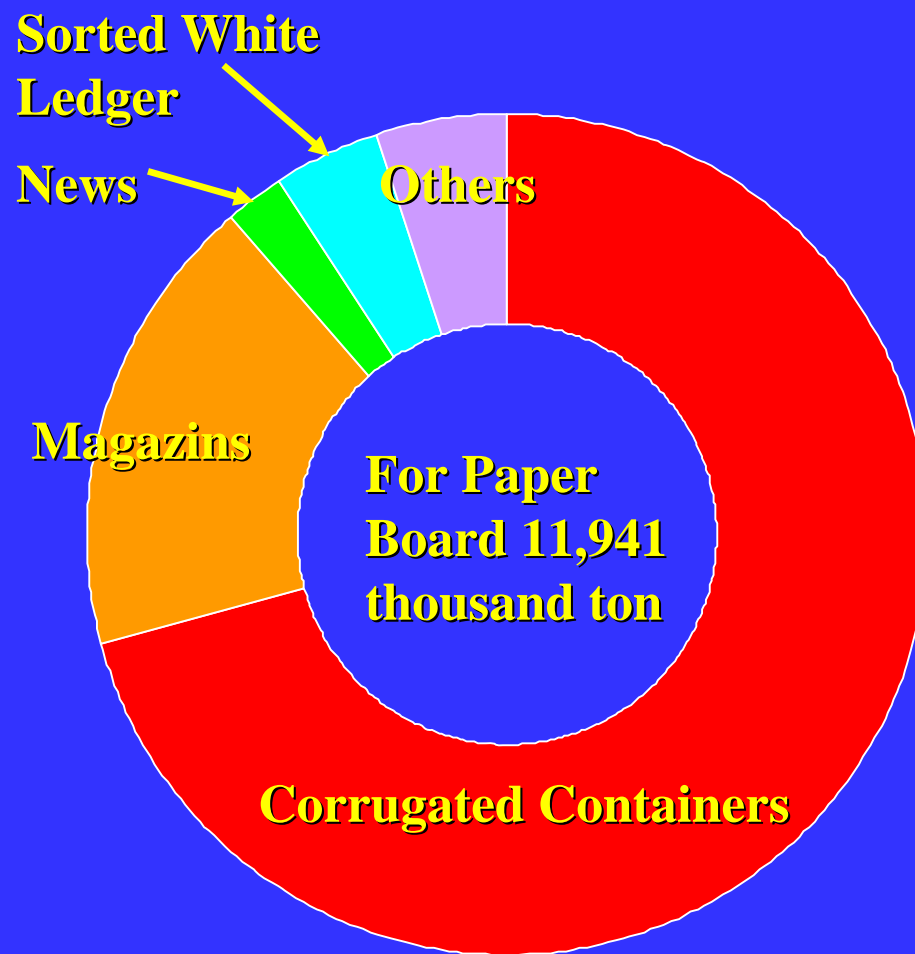
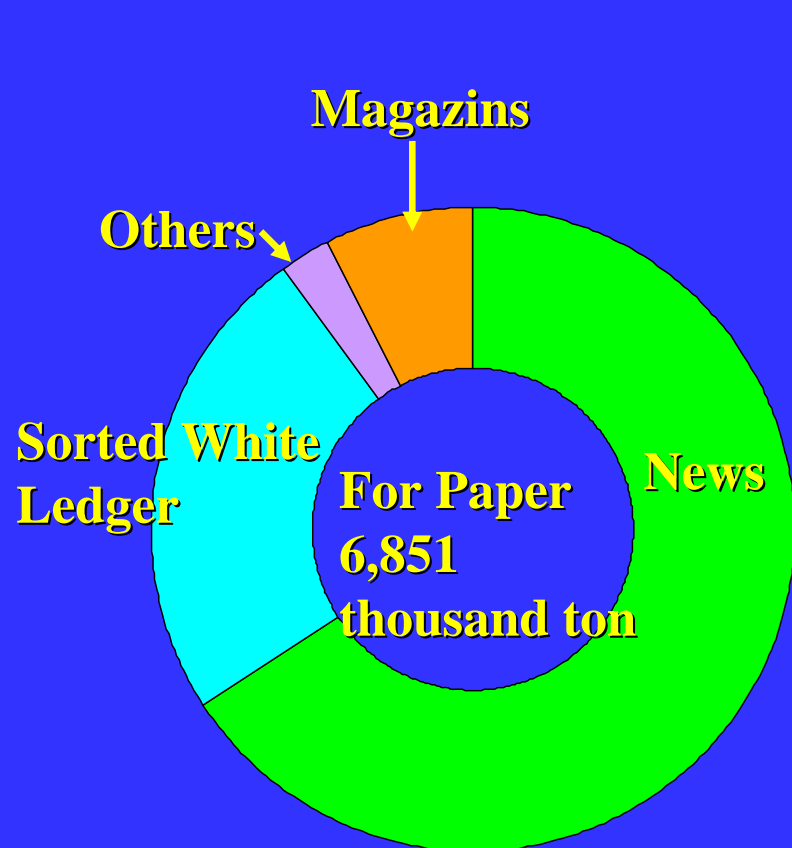
Utilization Rate of Recovered Paper



Waste Paper: Recovery Volume & Recovery Rate

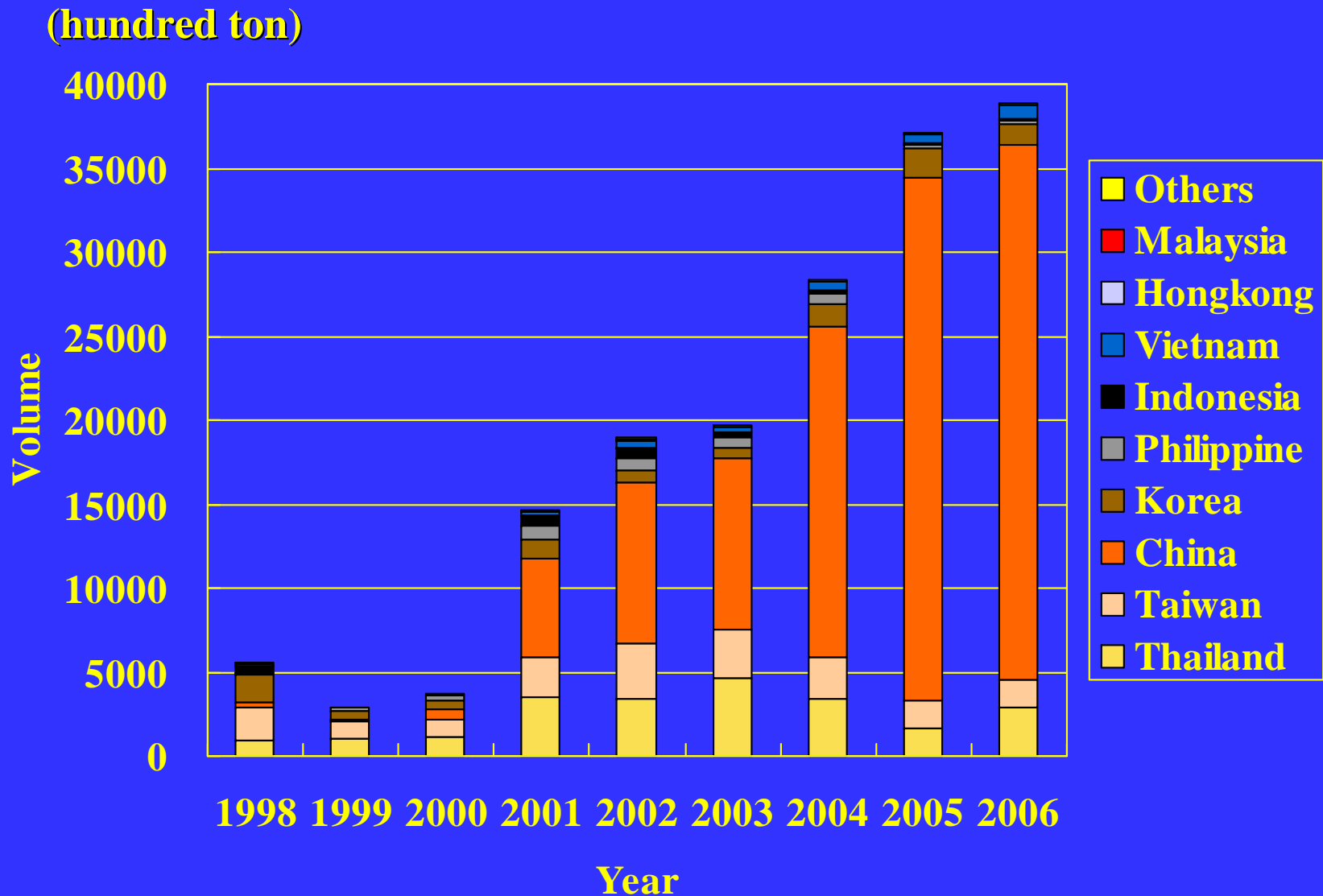


What Kinds of Recovered Paper Are Used for Paper and Paperboard Production



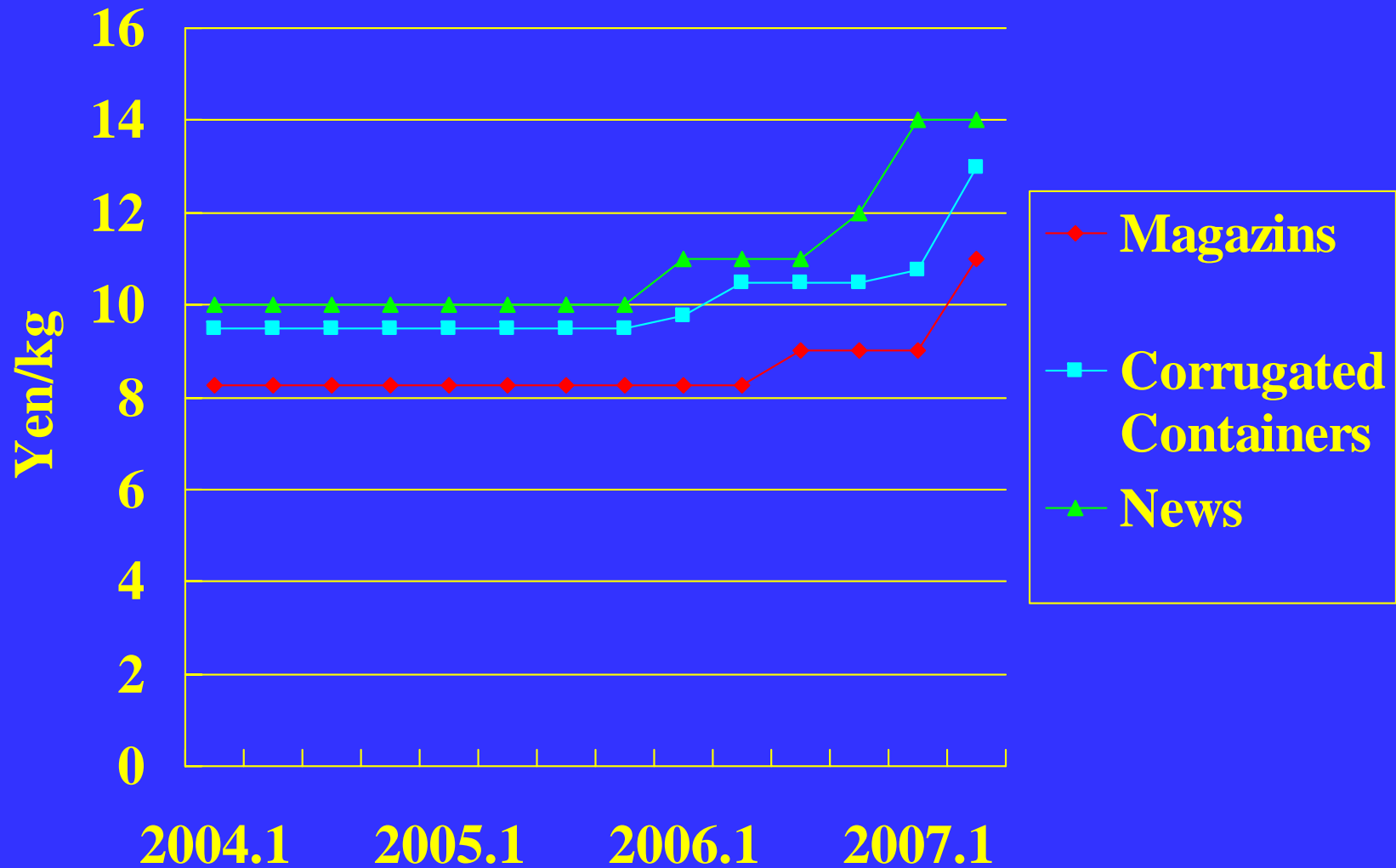
Influences of China (1)

Waste Paper Exports from Japan



Influences of China (2)

Waste Paper Prices



Waste Paper Utilization in Japan: Targets and Results

1991y Constitution of “Law for the Promotion of Utilization of Recycled Resources”

Target: waste paper utilization rate 55% by 1994

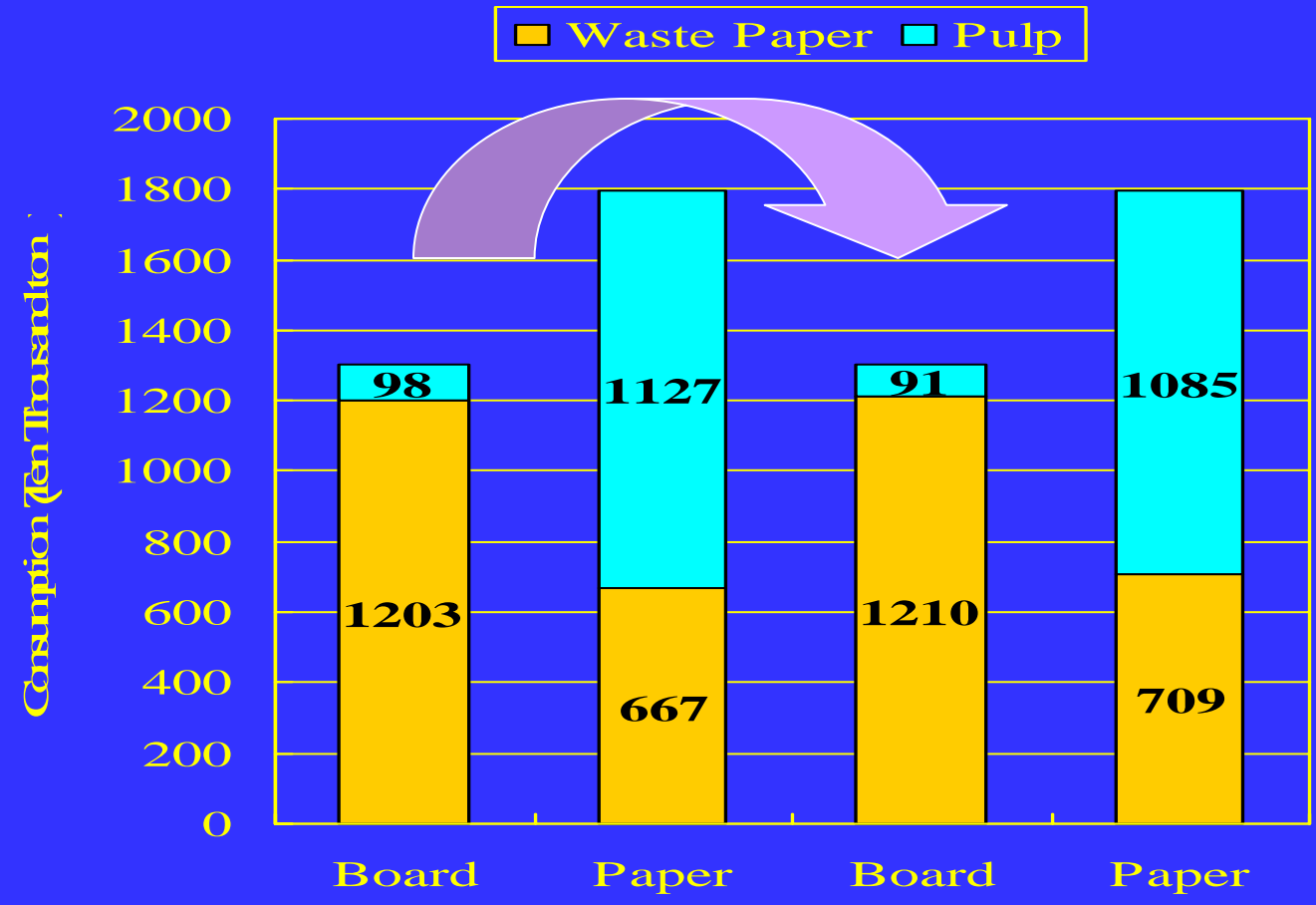
Result: accomplished by 53.3% in 1994

1995y **New Target:** waste paper utilization rate 56% by 2000
Achievement: 56.1% in 1999

2000y **New Target :** waste paper utilization rate 60% by 2005
Achievement : 60.2% in 2003

2005y **New Target :** waste paper utilization rate 62% by 2010

New Target : Utilization Rate 62% by 2010



**Utilization Rate
60.4%(2004)**



**Utilization Rate
62.0%(2010)**

Study on Safety of Food Containers Containing Recycled Pulp

- **Cooperative study with the government and the paper industry on food containers containing recycled pulp**
 - No health problems in most cases**
 - Safety authorization of using recycled pulp for food containers**
- **The guideline (voluntary standard)**
 - Good management of waste paper & production line**
 - Heavy metal 1µg/ml (as lead) below**
 - Not to be used in ovens and microwave ovens**

Studies on Binders and Adhesives for Promoting More Recycling

- **Studies on adhesives for bookbinding**

**Whether binders should be finely dispersed or not
in repulping process?**

Can water soluble binders be a substitute?

- **Adhesive Paper**

Development of water soluble adhesive

**Adhesive paper with water soluble adhesive can
be recycled**

Recyclable Inks and Surface Treatments

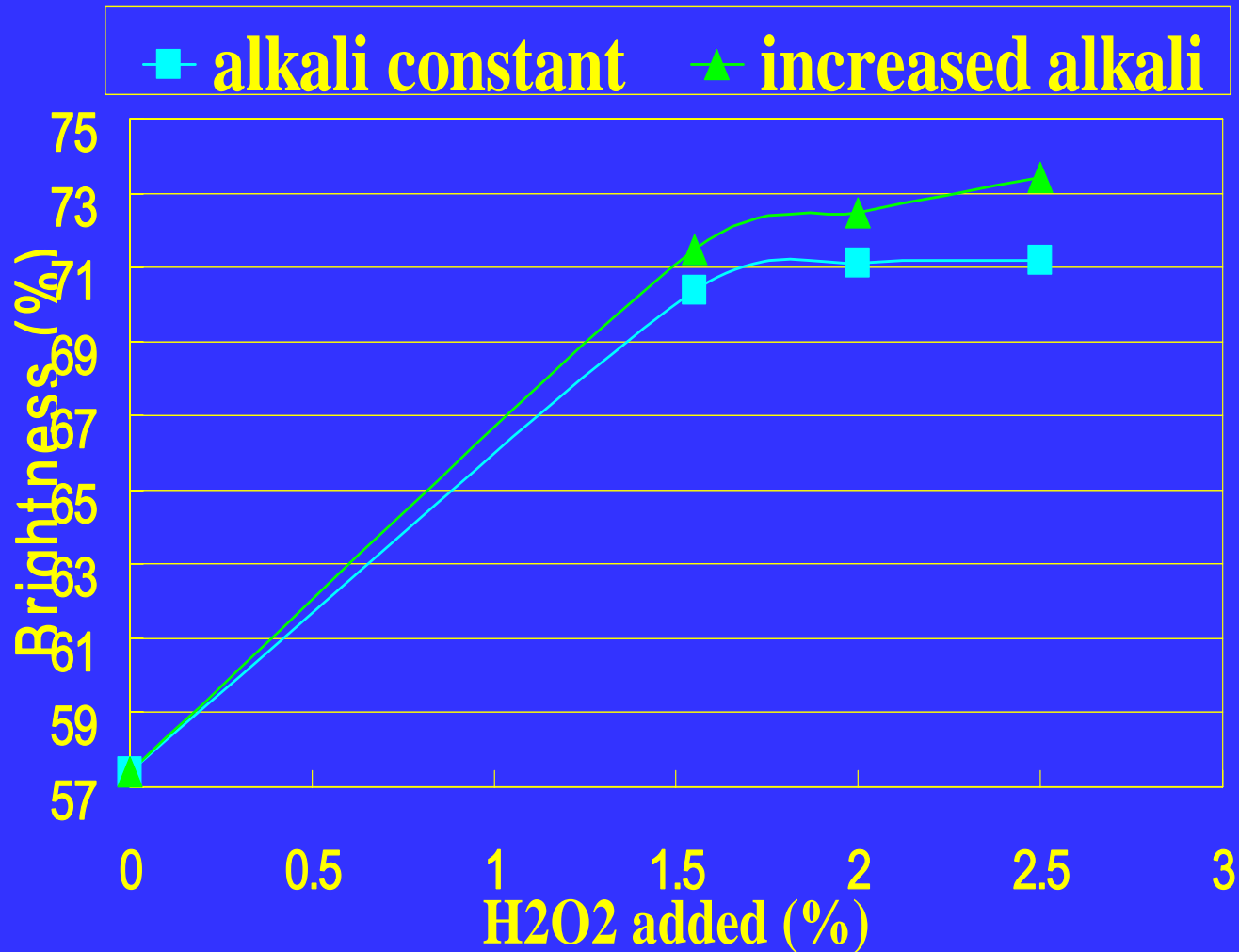
classification	type of ink	recyclable by lab. test	pilot test
gold, silver ink	Offset gold ink	○	○
	Offset silver ink	○	○
	Gravure gold ink	○	X
	Gold leaf	X	—
Pearl	Pearl	⊙	—
UV ink	Regular UV ink	X	—
	Hybrid UV ink hardening type	○	○
	Hybrid UV ink polymerization type	○	○
gloss treatment	UV coat 3μm	X	—
	UV coat 10μm	X	—
PP	Lamination PP	Unknown	X

DIP for New Application

- **Increase DIP contents in some paper grades**
 - **Use DIP in products that do not contain DIP yet**
- 1) DIP of 80% brightness from old news**
High brightness, 2 Step bleaching
Decrease dirt
 - 2) DIP of 70% brightness from old magazines**
Development low cost DIP with 70% Brightness

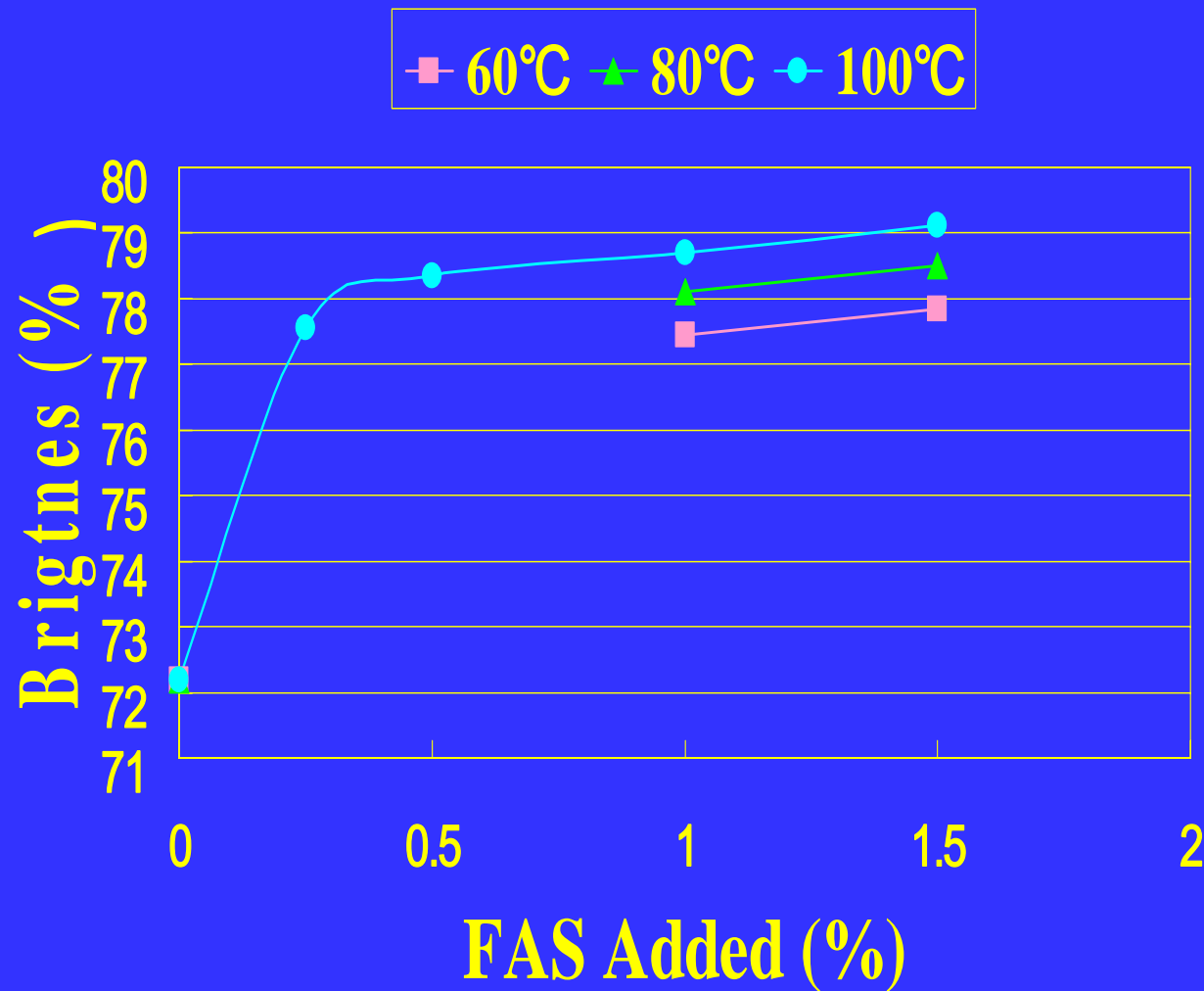
High Grade DIP from Old News

Bleaching with H₂O₂

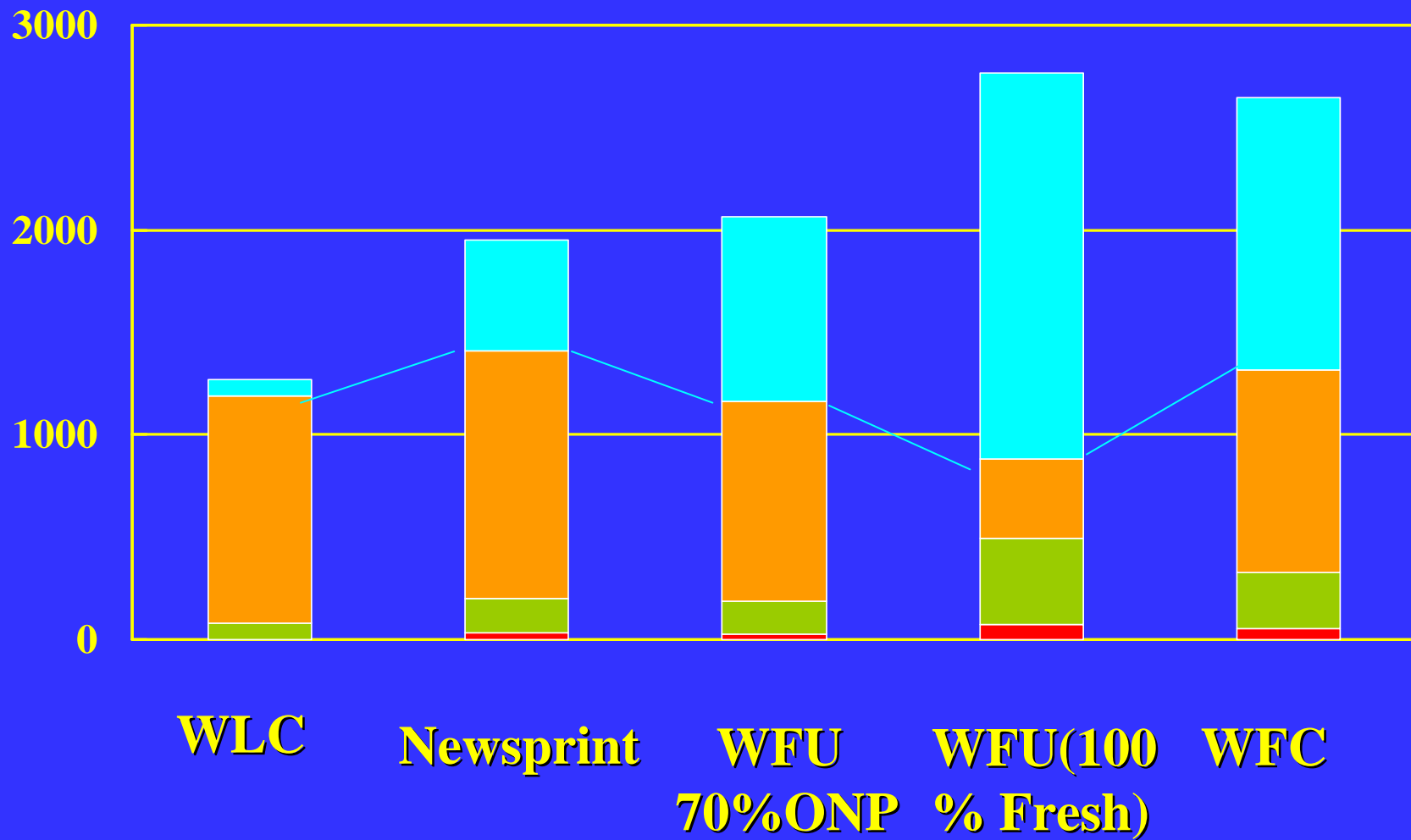
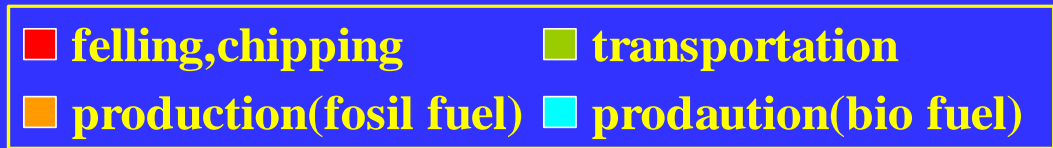


High Grade DIP from Old News

Bleaching with FAS



Paper Product LCA - CO₂ Emission (kgCO₂ / Paper ton)



Thank you for your attention

