



FIBRE BOX ASSOCIATION

The U.S. Corrugated Industry's Commitment to Sustainability

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FBA Vision/Mission

Trade association representing NA corrugated manufacturers

Vision:

To be the ***most-trusted voice*** in the North American corrugated packaging industry.

Mission:

The Fibre Box Association (FBA) is a non-profit trade association that represents North American corrugated packaging manufacturers and strives to ***grow, protect and enhance*** the overall well-being of the industry by providing member-valued programs and services.

Session Description

The waste stream is constantly changing in type and proportion; we're seeing less paper and more plastic, including multi-layer, flexible film pouches, etc. And what's packaging's impact on total waste generation. Up? Down? What are the potential environmental impacts of these material changes? Let's take a look.

Value of Packaging



- Protects



- Transports



- Sells



- Recycles



Value of Packaging

- Protection - Largest environmental impact of packaging is the consequence of not having packaging.
- Damaged/unusable product has far more environmental impact than the packaging that protects it.

What Is Waste?

The corrugated industry doesn't consider recovered corrugated as packaging waste. Packaging waste is a material that no longer has a use or value. According to the definitions found in the ISO 18600 standard series Packaging and the Environment, packaging waste is:

- packaging that has been used by the final consumer,
- is discarded for final disposal and
- is not intended for reuse or recovery.

That's certainly not the case with recovered corrugated. We recover over 90% of domestically produced corrugated and it becomes the source material for recycled containerboard (the paper that makes corrugated boxes).

Topics

- **Our Sustainability Efforts**
- **The Environmental Impact of Corrugated**



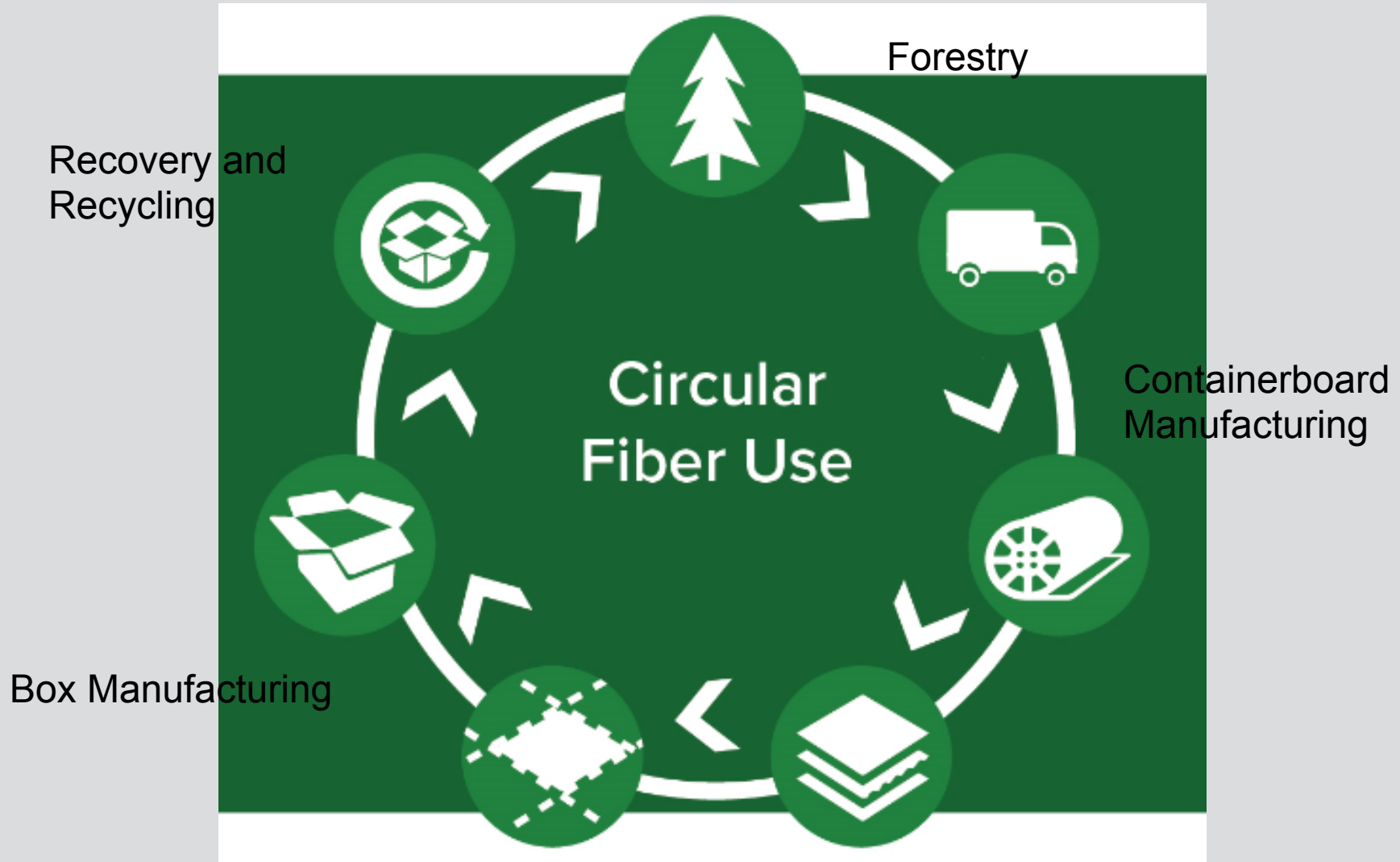
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Our Sustainability Efforts

Corrugated Life Cycle



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Paper Industry 2020 Sustainability Goals



- Paper Recovery → Exceed 70%
- Energy Efficiency → Increase purchased energy efficiency by at least 10%
- GHG Emissions → Reduce intensity by at least 20%
- Forestry → Increase certified fiber procurement
- Safety → Reduce incidence rate by 25%
- Water → Reduce use in mills by 12%

Corrugated Industry is “RENEWABLE”



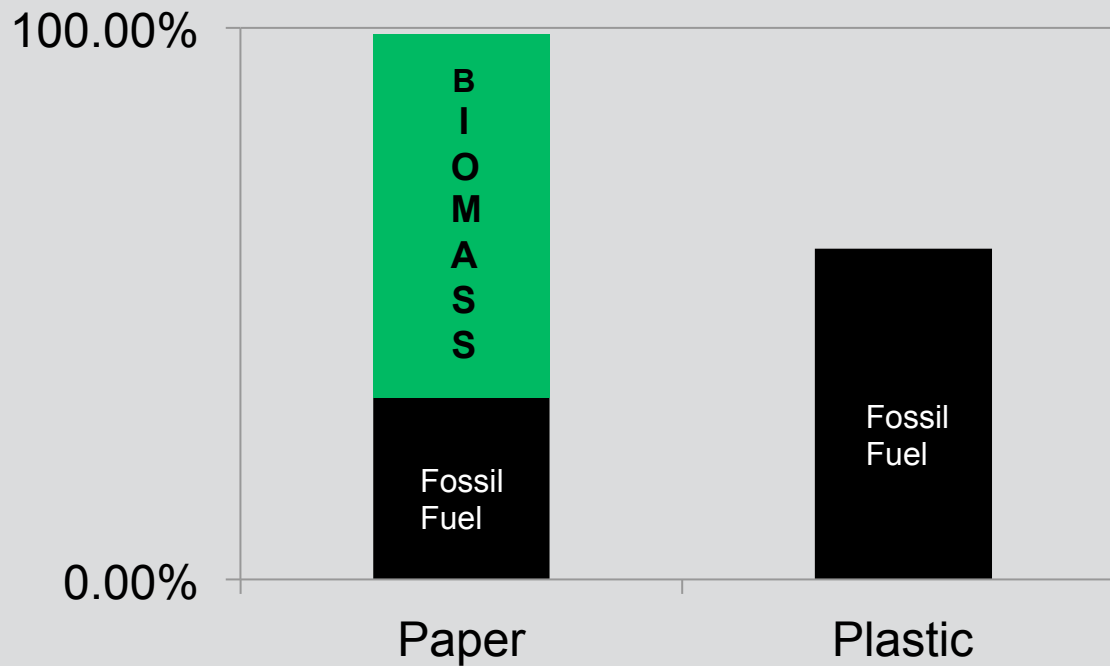
There are more trees today in the U.S. than there were 100 years ago.

Forestry



- 751 MM acres of forestland in U.S. (one-third of U.S. land mass)
 - 504 MM acres classified as timberlands
 - 91% of wood harvested in the U.S. is from privately-owned farms
 - 28% of harvest in the U.S. is initially directed towards pulp facilities
- 3.2MM seedlings planted each day (1.2B/year) in the U.S.
- 1.7 growth-to harvest ratio
- 20-30 year growth span
- Trees absorb CO₂, enough to offset 10% of nation's CO₂ emissions
- Development of Sustainable Forestry Practices and Sustainable Forestry Certifications (SFI, PEFC, FSC)

Containerboard Mills



Two-thirds of energy in kraft paper mills comes from biomass fuels – carbon-neutral.

Containerboard Mills



Improvements:

- AF&PA 2020 Better Practices, Better Planet Goals
- Reduced water use
- Continued conversion to natural gas

Converting Plants

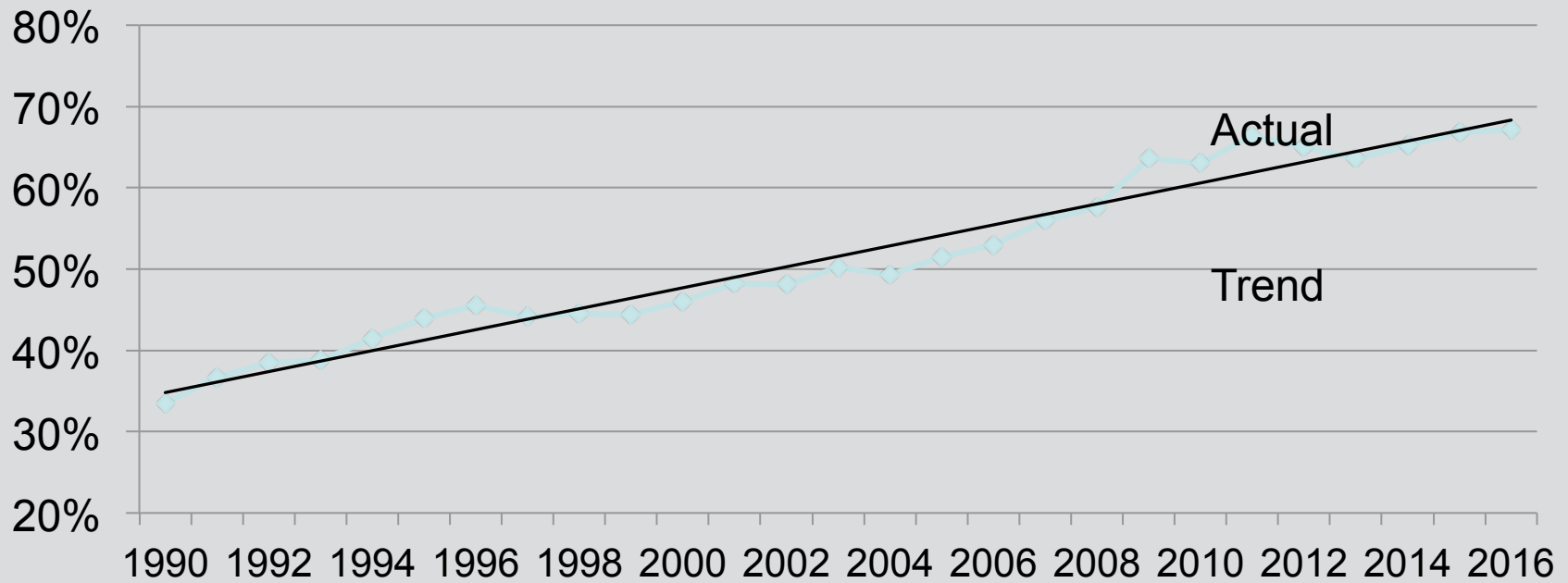
Improvements:

- Continued conversion to natural gas
- Re-lamping
- High-efficiency boilers
- Optimized package design (right-sizing)
- Renewable energy (solar, wind)
- Sponsored 3 industry-average LCAs to track progress

U.S. Paper Recovery Rate 1990-2016



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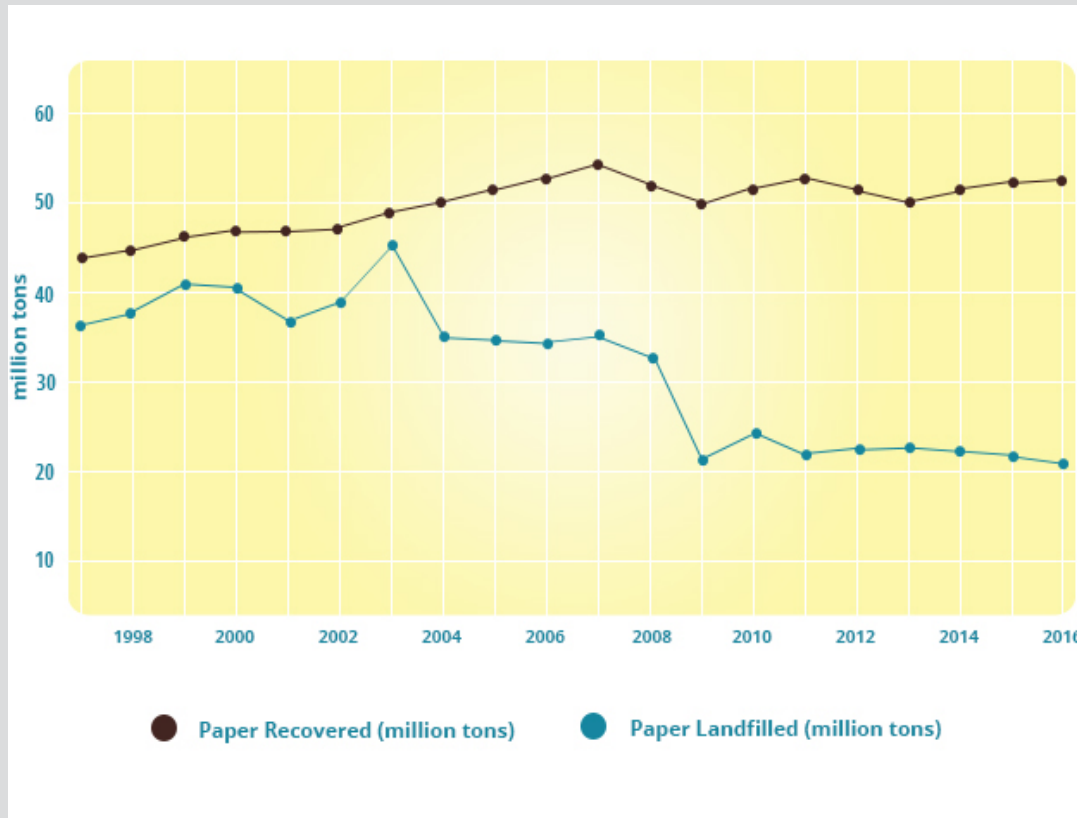
Source: AF&PA

Recoverable

- Packaging Materials Scorecard

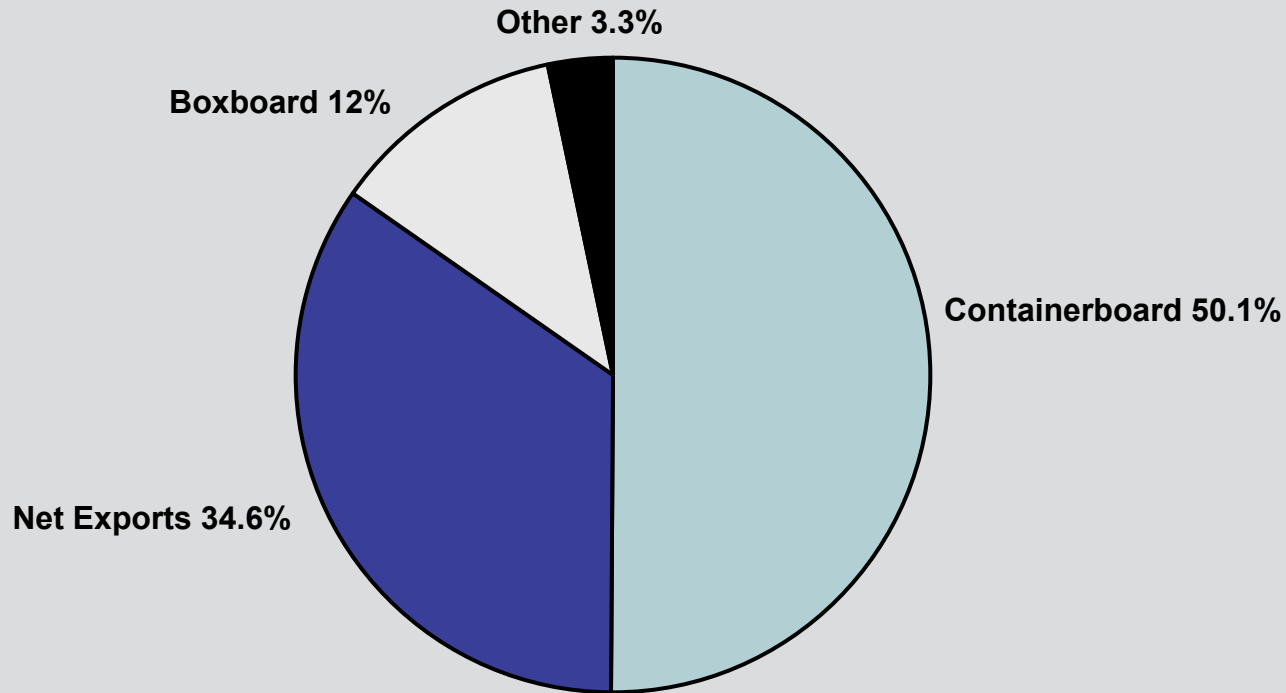
	<u>2014 EPA Recovery Rate</u>
– Paper/Packaging (OCC)	74.8% (91%)
– Metals	5.8%
– Glass	7.6%
– Plastics	5.4%
– Other	6.5%
- Market Incentives – \$
- Curbside Collection – 96%
- Landfill Usage for paper has declined by half since 2000.

EPA Landfill Report - 2015



- Increased recovery of paper-based products
- Reduced impact on landfills
- Reduced CO2 emissions
- Reduced methane emissions
- Less paper entering landfills than plastic

Corrugated Boxes are “RECYCLABLE”



Almost all recovered OCC is being recycled for use in domestic products and exported for use in packaging around the world.



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The Environmental Impact of Corrugated

Industry Average LCA

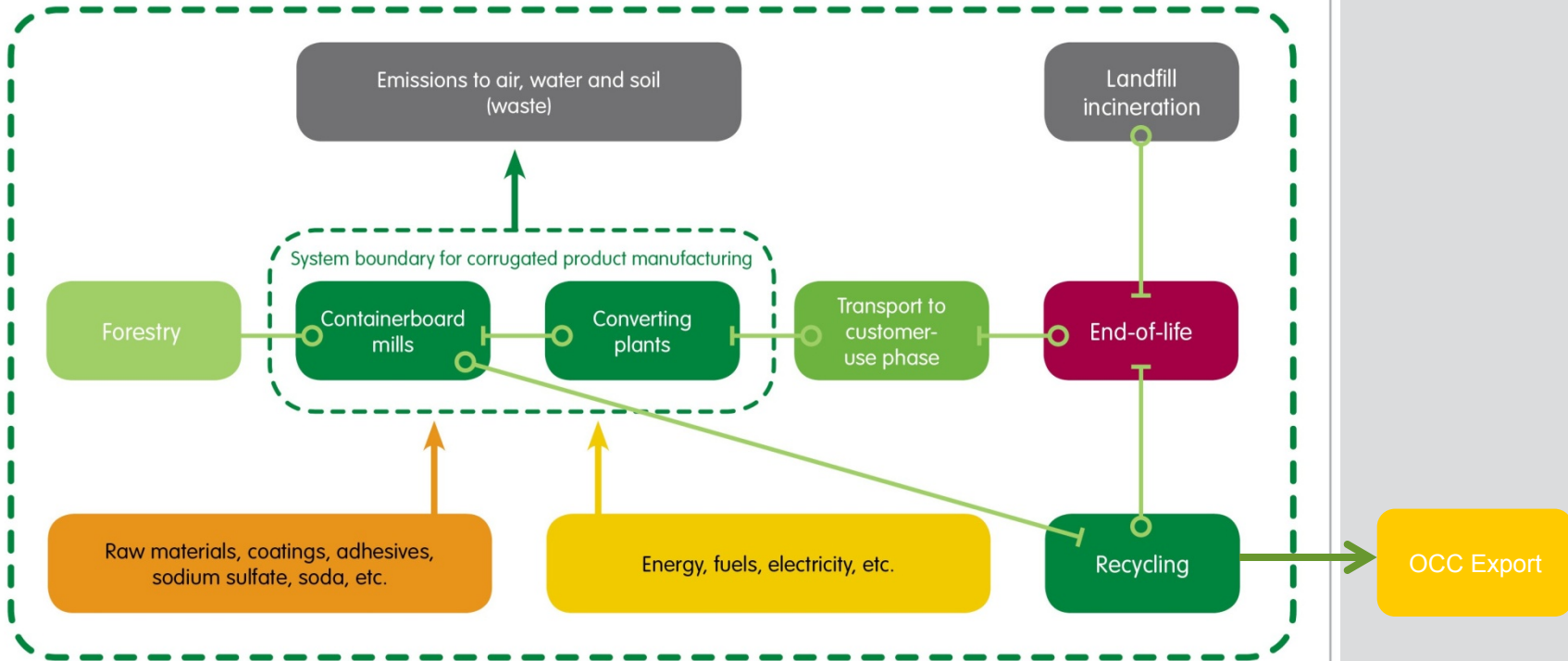
Purpose:

Answer the question, “What is the cradle-to-grave impact of one kilogram of corrugated product on the environment?”

Industry Average LCA – Scope

Figure 1.

System Scope and Life-cycle Phases for U.S. Average Corrugated Product
Summary of System Boundaries



Corrugated Life Cycle Impacts



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Key Findings

Industry continues to improve

- Environmental performance improved significantly in most impacts between 2006 and 2014
- Pulp and papermaking production (containerboard) is main driver of environmental performance
- End-of-Life is only important with respect to global warming indicator results

Actual LCA Results: 2014 versus 2006

• Global Warming	35% reduction
• Eutrophication	29% reduction
• Smog	23% reduction
• Water Use	21% reduction
• Respiratory	21% reduction
• Acidification	20% reduction
• Renewable energy	13.8% increase
• Non-renewable energy	9.8% reduction
• Fossil fuel depletion	3.8% reduction
• Ozone	3.4% reduction



Main Change Drivers



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Parameter	2006	2010	2014	Impact
Recovery Rate	72%	85%	89.5%	Increasing recovery rate decreases amount going to landfill, leading to reduced GW.
Utilization Rate (kg/ kg CBD)	0.42	0.46	0.52	Increased usage of recovered fibers reduces carbon removal (sequestration), total energy use at mills (renewable) and water use. Overall, a net benefit to GW.
Board from 100% recycled fibers	22.3%	26.6%	30.5%	
Carbon Removal (kg CO ₂ eq/kg CP)	-2.8	-2.6	-2.4	Reduced carbon removal is due to use of more recycled fibers, leading to increased GW.

Main Change Drivers



Parameter	2006	2010	2014	Impact
Total fossil fuels used at mills (MJ HHV/kg CBD)	23.8	23.4	22.1	Less fossil fuel use reduces GW and other air emissions (ODP, POCP, AP, RES).
Share of natural gas in mill fuel mix	46%	54%	73%	More natural gas in the fuel mix reduces GW and air emissions, but increases fossil fuel depletion (FF) because it is harder to extract.
Total energy used in converting (MJ/kg CP)	2.1	1.9	1.9	Less energy reduces GW and other air releases. It also reduces non-renewable energy demand (NRPE).
Natural gas used in converting (MJ HHV/kg CP)	0.82	1.03	1.09	More natural gas in the fuel mix reduces GW and air emissions, but increases fossil fuel depletion (FF) because it is harder to extract.

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How we improved

- **Increased recovery of OCC** at end-of-life from 72% in 2006 to 89.5% in 2014, which reduced landfill emissions of methane (GW impact)
- **Increased use of recycled fibers**, which reduces water and total energy use at mills as well as carbon sequestration (NRPE, WU, NRPE, RPE, GW).
- **Reduced energy use at mills**, which reduced GHG and other air releases. (GW, ODP, POCP, AP, RES, NRPE)
- **Increased use of more-efficient fossil fuels** by switching from oil/coal to natural gas, which reduced GHG other air emissions and increased Fossil Fuel Depletion. (GW, ODP, POCP, AP, RES, NRPE, FF)

Corrugated Industry is Committed to Improving



- ✓ Planting more trees than are harvested
- ✓ Procuring fiber from sustainable forests
- ✓ Recovering fiber and avoiding landfills
- ✓ Replacing fossil fuels with carbon-neutral biomass fuels
- ✓ Reducing water consumption and usage
- ✓ Right-sizing designs
- ✓ Transporting products cost effectively to consumers
- ✓ Providing jobs to nearly 100,000 Americans in over 1,000 towns
- ✓ Maintaining safe work environments
- ✓ Being RESPONSIBLE

Questions?



Thank you

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