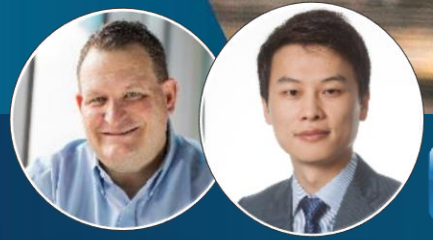
Transitioning towards a more circular economy with chemical recycling

2021 Vinyl Recycling Summit



Jayme Leita | Henry Li

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EASTMAN

A materials innovation company

- Celebrating more than **100 years of vital innovations that enhance people's lives every day.**
- A Fortune 500 company with approximately **14,500 employees and approximately 8.5 billion USD** in revenue
- Dedicated to **enhancing the quality of life in a material way**
- Sustainability strategy commitment to **mitigating climate change, mainstreaming circularity** and **caring for people and society**

NEW PLASTICS ECONOMY Global Commitment

U.S. PLASTICS PACT

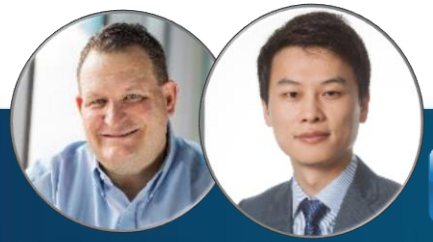
ENERGY STAR AWARD 2019 PARTNER OF THE YEAR Sustained Excellence

AMERICA'S MOST JUST COMPANIES Forbes 2017

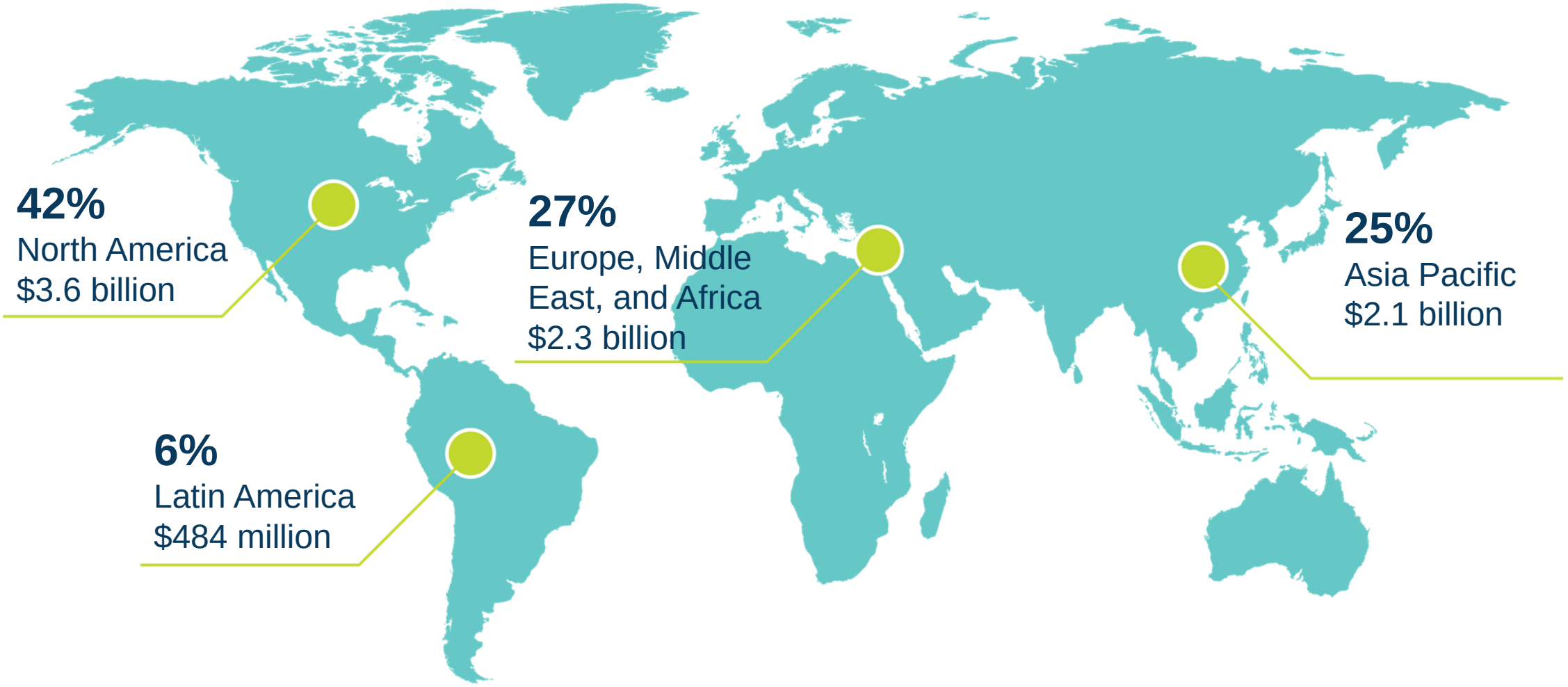
Responsible Care® OUR COMMITMENT TO SUSTAINABILITY

WSJ 100 MOST SUSTAINABLY MANAGED COMPANIES 2020

TOP 100 BARRON'S Most Sustainable Companies 2021



Globally integrated operations



51 manufacturing sites in 14 countries

Approximately 14,500 employees around the world

Serving customers in more than 100 countries

Three simultaneous global crises need solutions

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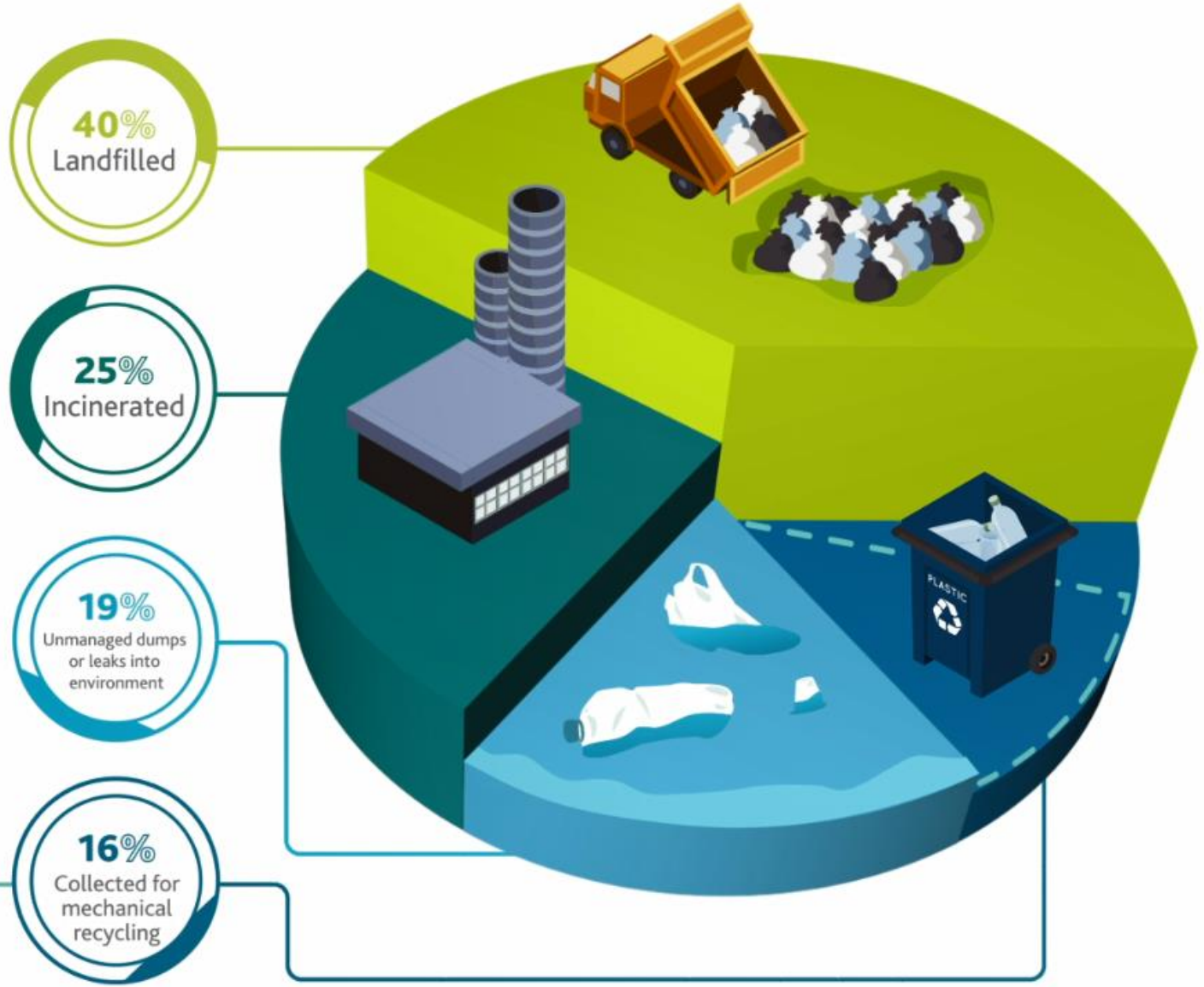
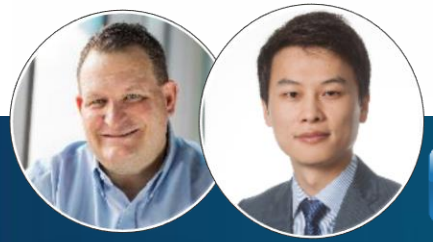
Opportunities **going to waste**

300 million metric tons
of plastics are produced globally

260 million metric tons
of plastics are disposed





Plastics are essential …
but the waste issue must be solved

HYDRATE

Plastics help to deliver hydration to those who need it

FEED

Advanced packaging technologies preserve fruits, vegetables, & meats

CARE

Plastics improve sterility, patient safety, and comfort in therapies

REDUCE **REUSE** **RECYCLE**

Mechanical recycling is not enough to solve the plastic waste problem.

	Common Uses	Share of Plastic Waste Generated	Mechanically Recycled?
1 PETE Polyethylene Terephthalate	Bottles	14%	Yes (clear) ~ 30% recycle rate
	Films, Forms, Other		✗
	Textiles	N/A	**Very Little**
	Carpet	N/A	**Very Little**
2 HDPE High Density Polyethylene		17%	**Yes ~ 9% recycle rate** **Natural HDPE ~ 31%**
3 PVC Polyvinyl Chloride		3%	**Very Little, Specialized**
4 LDPE Low Density Polyethylene		23%	**Very Little**
5 PP Polypropylene		23%	**Very Little**
6 PS Polystyrene		7%	✗
7 OTHER Other (acrylic, polycarbonate, PETG, mixed plastics)		13%	**Very Little** *Diversity of materials risks contamination*

Most mechanical recycling results in **downcycling** into lower value products that eventually are landfilled.

Generated share & recycled share of material sent to US Municipal Solid Waste in 2017 reported as recycled by US EPA. "Combusted" materials not considered recycled. Total of 32,120,000 MT discarded. Recyclability from OurWorldinData.org

MECHANICAL AND MOLECULAR RECYCLING

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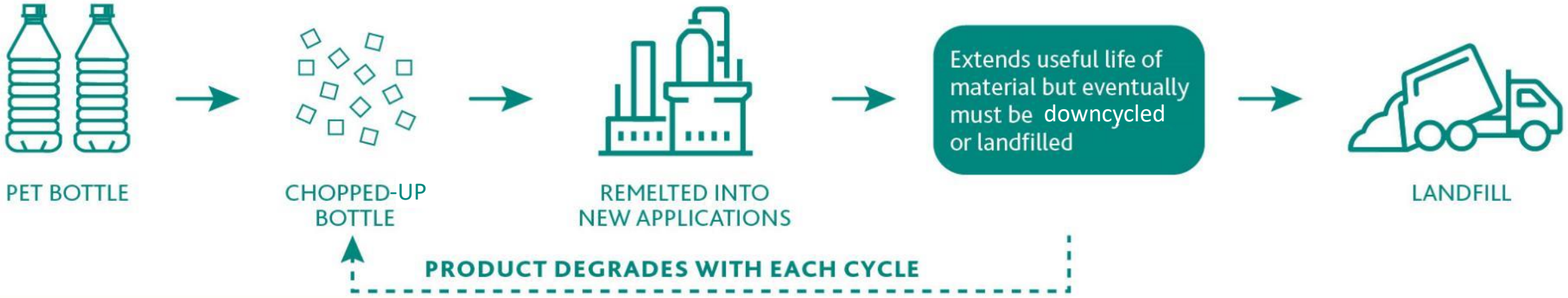
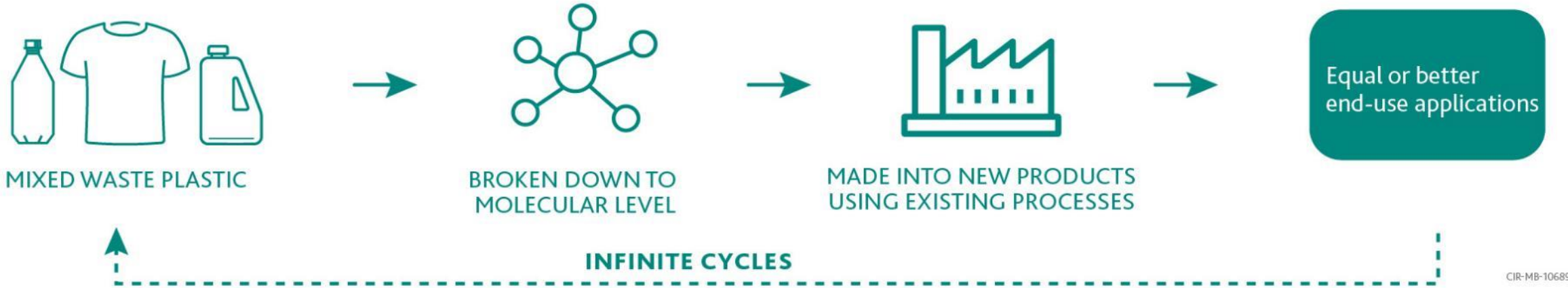
MECHANICAL RECYCLING



MOLECULAR RECYCLING



Vision for a sustainable future…

Transforming our product portfolio to participate in the circular economy via **two loops**

Eastman's Advanced Circular Recycling Technologies

Carbon renewal technology

REFORMING
Operational today

20-50% less GHG emissions*

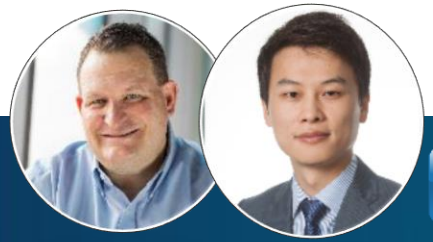
Polyester renewal technology

GLYCOLYSIS
Operational today

20-30% less GHG emissions*

METHANOLYSIS
Operational by **2023**

20-30% less GHG emissions*



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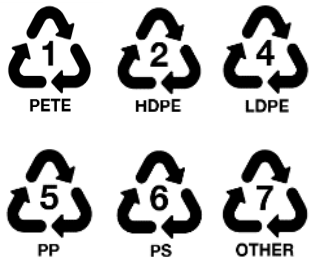
*Based on production of intermediates versus fossil feedstocks

EASTMAN'S ADVANCED CIRCULAR RECYCLING TECHNOLOGIES

Carbon renewal technology (CRT)



MIXED PLASTIC WASTE

REFORMING (NOW)

MOLECULES

CO, H_2
(syngas)

Cellulosic Plastics, Textile Fibers, Plasticizers, & Acetyl Chemicals
(20-100% recycle content)

20-50% LOWER GHG
(syngas)

Polyester renewal technology (PRT)

PET PLASTIC WASTE

GLYCOLYSIS (NOW)

METHANOLYSIS (2022)

MONOMERS

recycled DMT, recycled EG

Copolyesters, Specialty Plastics, & Plasticizers
(30-100% recycle content)

20-30% LOWER GHG
(rDMT, rEG)

Mechanical recycling is not enough to solve the plastic waste problem.

	Plastic Type	Common Uses	Share of Plastic Waste Generated	Mechanical Recycling?	Eastman Advanced Circular Recycling?	
					PRT	CRT
1 PETE	Polyethylene Terephthalate	Bottles	14%	Yes (clear) ~ 30% recycle rate	✓	✓
		Films, Forms, Other		✗	✓	✓
		Textiles	N/A	Very Little	✓	✓
		Carpet	N/A	Very Little	✓	✓
2 HDPE	High Density Polyethylene		17%	Yes ~ 9% recycle rate Natural HDPE ~ 31%	✗	✓
3 PVC	Polyvinyl Chloride		3%	✗	✗	Not Yet *(2nd generation)*
4 LDPE	Low Density Polyethylene		23%	Very Little	✗	✓
5 PP	Polypropylene		23%	Very Little	✗	✓
6 PS	Polystyrene		7%	✗	✗	✓
7 OTHER	Other (acrylic, nylon, polyurethane, polycarbonate, PETG)		13%	Very Little *Diversity of materials risks contamination*	✗	✓

Generated share & recycled share of material sent to US Municipal Solid Waste in 2017 reported as recycled by US EPA. "Combusted" materials not considered recycled. Total of 32,120,000 MT discarded. Recyclability from OurWorldinData.org

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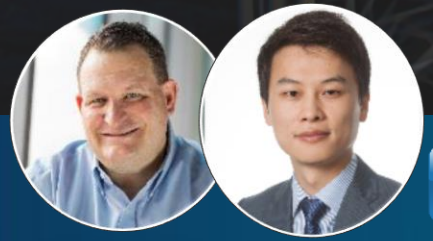
Eastman Advanced Circular Recycling Technologies:

carbon renewal & polyester renewal
will process over

250 million

pounds of waste annually by 2025

and 500 million pounds by 2030



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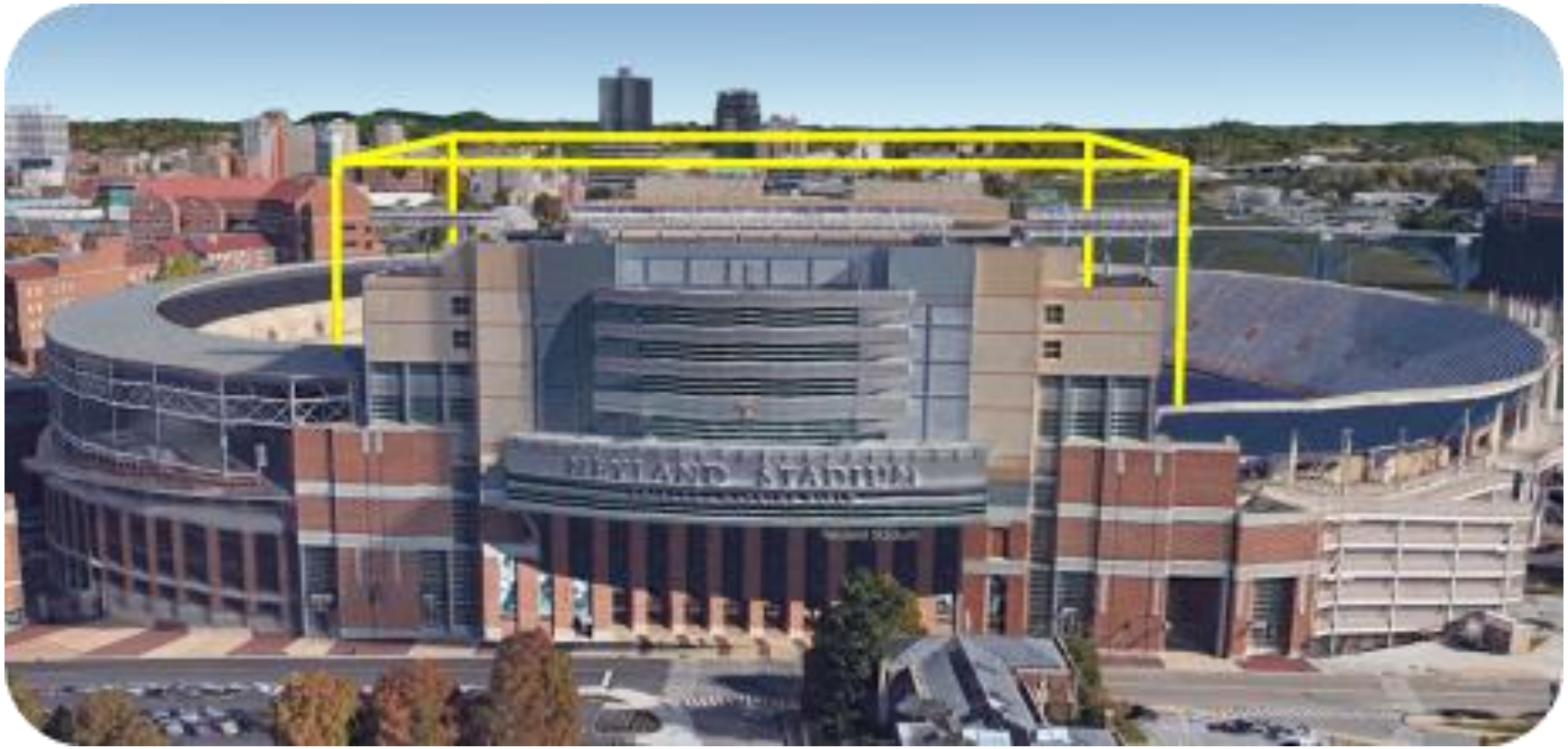
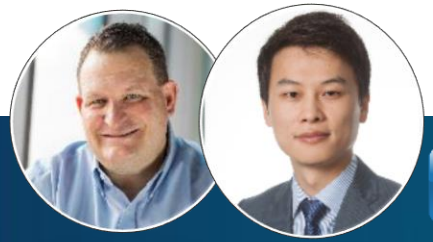
What does 250,000,000 pounds of waste plastic look like?



Neyland Stadium in Knoxville, Tennessee is one of the largest stadiums in the world (Top 10).
250,000,000 pounds of ground waste plastic would fill this yellow box inside of Neyland Stadium.
We will be processing this volume of plastic waste each year starting in 2023.



Delivering world-class products and solutions

nalgene MADE IN USA

QUALIFORM

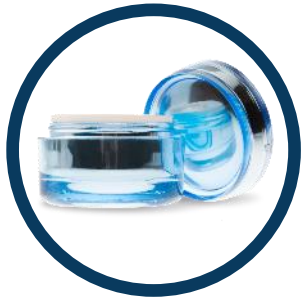
CAMELBAK

ESTĒE LAUDER COMPANIES

MARCHON

H&M

LANDER



Eastman Cristal Renew

Eastman Tritan Renew

Eastman CDA Renew

Eastman Naia™ Renew

Eastman Renew plasticizers

INTRODUCING A **NO-CHANGE** SOLUTION THAT **CHANGES EVERYTHING**

Committed to your sustainable future
Eastman is committed to creating solutions with higher sustainable content and a lower carbon footprint.

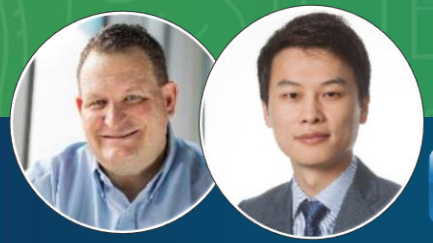
Sustainability without compromise
Our sustainable plasticizers are identical in chemical makeup, performance, and regulatory certifications to our legacy products.

Sustainability without greenwashing
Our plasticizers have ISCC-certified renewable content, offering a credible, certified, and transparent solution to address the global waste problem.

Sustainability without waiting
Powered by Eastman Advanced Circular Recycling technologies, these solutions are available at scale right now!

Eastman Renew plasticizers	Certified recycled content*
Eastman 168™ Renew 20 non-phthalate plasticizer	20%
Eastman DOA Renew 20 plasticizer	20%
Eastman Triacetin Renew 59	59%

**Certified recycled content is achieved using mass balance allocation.*



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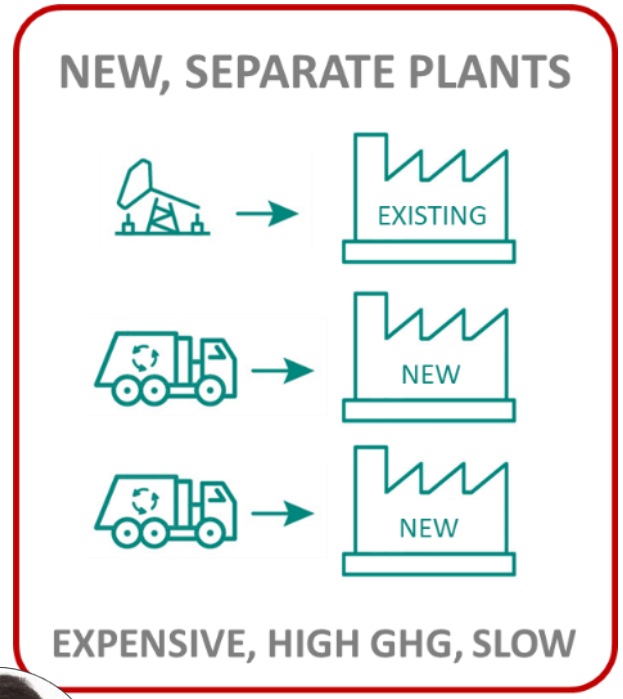
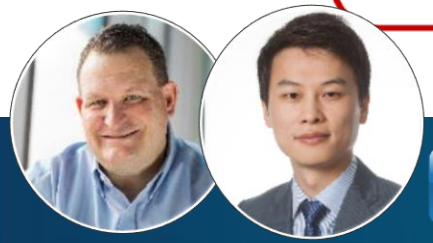
Mass balance accounting is necessary to achieve scale NOW

Without mass balance, duplicate infrastructure is required (plants, storage, logistics, etc.), essentially making it cost prohibitive to get to large scale by **dramatically increasing** timelines, costs, and carbon footprints.

With mass balance, existing assets can be modified to start **scaling waste plastic as feedstock quickly**.



Mass balance offers a better way



THIRD-PARTY CERTIFICATION

Eastman is using a highly credible, transparent, well-established, regularly audited standard for mass balance. Becoming certified is a *competitive advantage* for the circular economy.

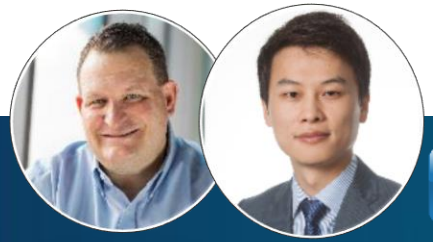
Who is ISCC?

- Global sustainability certification system
- Includes all types of sustainable feedstocks
- Developed by multi-stakeholder association
  - Corporations
  - Research institutions
  - NGOs
- Transparent, detailed, and publicly available standards
- Most popular certification for chemical recycling in circular economy
- ISCC conducts internal reviews, provides guidance, and supports system users

Why ISCC?

- Highly regarded international standard for circular and bioeconomy
- Credible third party with detailed standards
- Multi-stakeholder perspective
- Leader and significant momentum for chemical recycling applications

ISCC
International Sustainability & Carbon Certification



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Thank you!
Questions?

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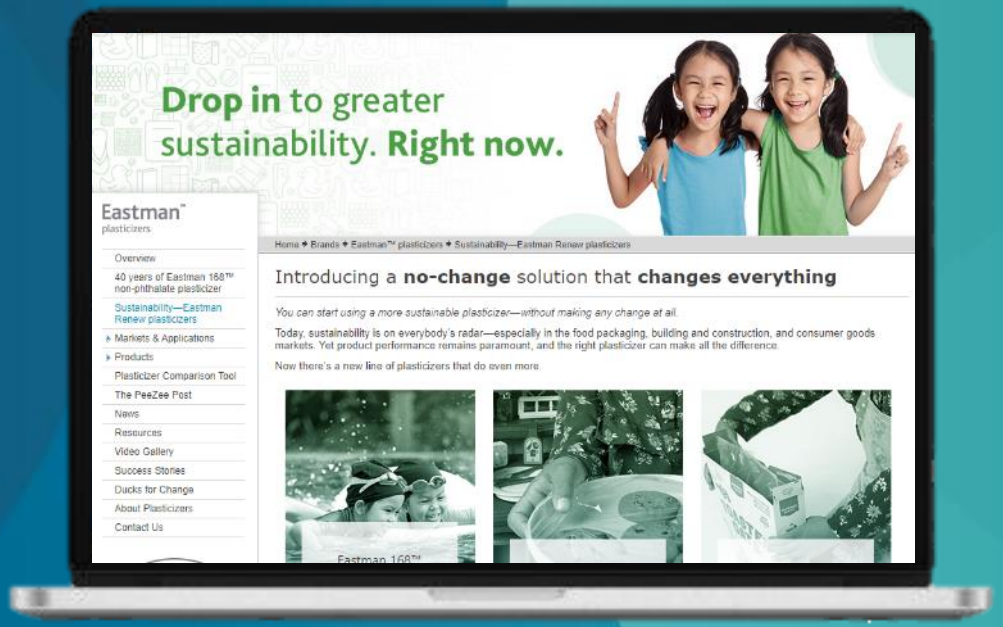
Find more resources at Eastman.com/renewplasticizers



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