

URGENT PROBLEM, TRANSFORMATIVE SOLUTIONS:

The transition to a circular economy and the emergence of advanced recycling technologies for plastics

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Eastman, at a glance . . .



- A Fortune 500 company
- 2018 revenue of approx. **10 billion USD**
- Serve customers in over **100 countries**
- Approx. **14,500 employees**
- A journey from a diversified to a **materials innovation company**
- A **century of innovation** embedded in our culture
- Operating **four business segments:**
 - Additives & Functional Products
 - Chemical Intermediates
 - Fibers
 - Advanced Materials

World-class specialty plastics for worldwide markets



Ophthalmics

- Sunglasses
- Reading glasses



Medical

- Devices, bags, and tubing
- Suction and drainage
- Culture tubes



Durables

- Food containers
- Baby bottles
- Appliances



Electronics

- Displays
- Tablets and notebooks
- Smartphones



Retail and Architecture

- Molding and trim
- Store displays
- Skylights



Packaging

- Household
- Cosmetics
- Food and beverage



3D Printing

- Printing filaments
- Powder

Our world is evolving

Attitudes about plastics are changing rapidly. Public sentiment has become increasingly negative.

Circular Economy



Public Perception



Regulatory



Value Chain



Plastics improve quality of life...*But the waste issue must be solved.*



HYDRATE

2.2B people globally still do not have access to clean drinking water



FEED

Advanced packaging technologies can prevent 72k tons of landfilled food, preventing 329k tons GHG emissions annually in the US*



CARE

Plastics improve sterility, patient safety and comfort in therapies



Defining the waste problem

300 million metric tons
of plastics is produced globally

260 million metric tons
of plastics are disposed

12%

25%

40%

19%



**Mechanically
recycled**



Incinerated



Landfills



**Unmanaged dumps or
leaks into environment**

This is leading to the vilification of plastics

Vision for a sustainable future

EASTMAN

Creating value from waste through Eastman advanced circular recycling technologies

CARBON RENEWAL TECHNOLOGY

Converts complex waste



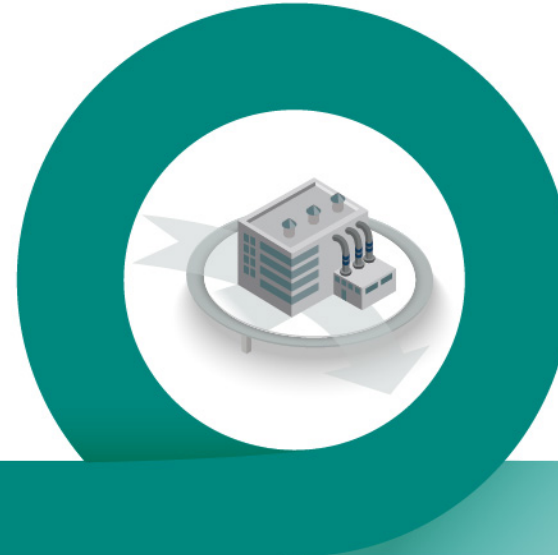
REFORMING

Operational today

20%–50% less GHG Emissions

POLYESTER RENEWAL TECHNOLOGY

Converts polyester waste



GLYCOLYSIS

Operational today

20%–30% less GHG emissions
(2020 estimate)

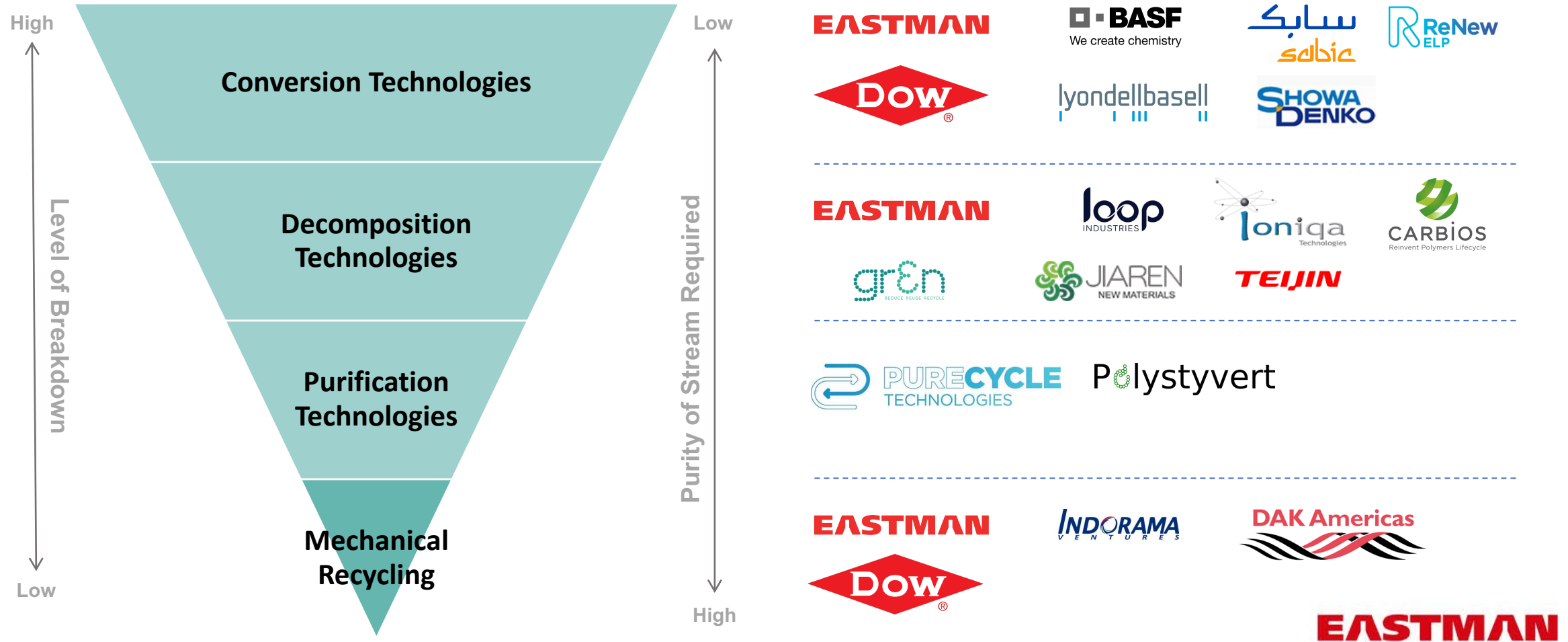
METHANOLYSIS

Operational by 2022

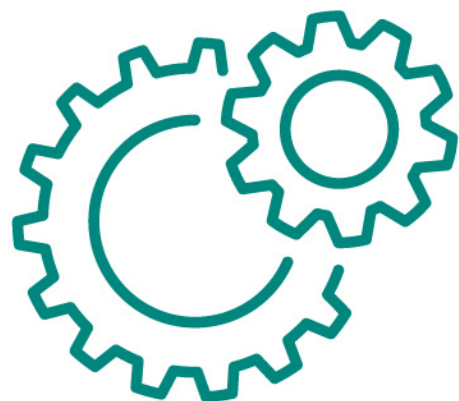
>30% less GHG emissions
(2020 estimate)

Technology Developments

Material suppliers and start ups are making announcements and investments around chemical and mechanical recycling.



MECHANICAL RECYCLING



Optimum LCA and easy technology to implement, **but...**



Requires clean sources of unmixed PET or HDPE



Reduced performance in key properties



Due to polymer degradation, limited number of recycle times

CHEMICAL RECYCLING



Robust process enables broader mix of inputs



Broken down chemically, impurities removed



Indistinguishable performance from prime materials

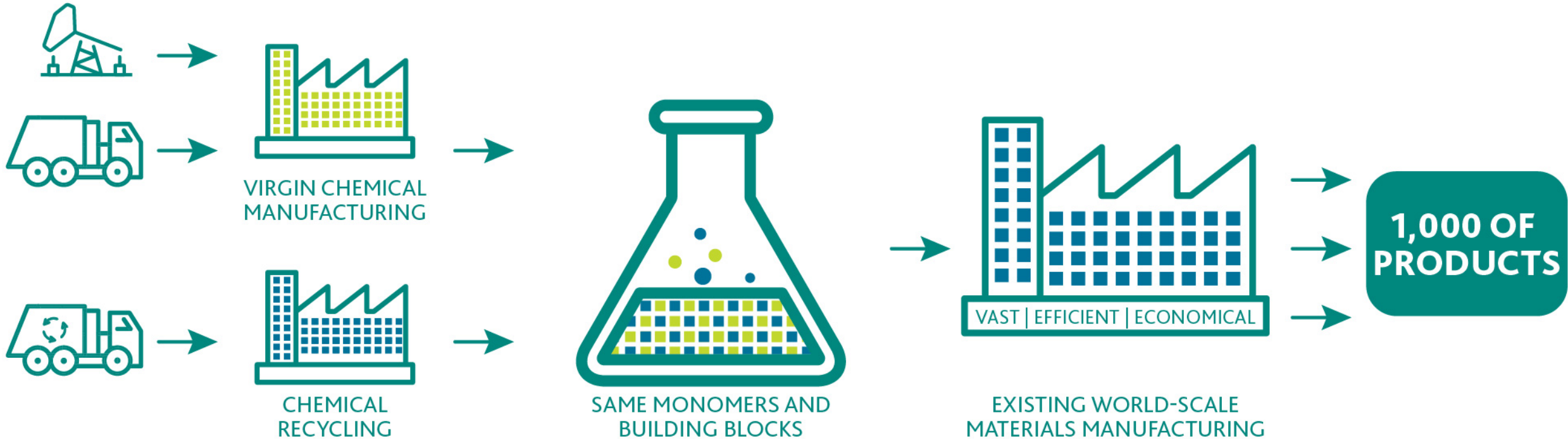


Unlimited recycle times

SIGNIFICANT LIMITATIONS OF MECHANICAL RECYCLING CAN BE ADDRESSED THROUGH CHEMICAL RECYCLING TECHNOLOGIES, OPENING UP A BROADER MIX OF PRODUCTS FOR RECYCLING.

WHY MASS BALANCE?

EASTMAN



MASS BALANCE EFFICIENTLY ENABLES THE FUTURE OF RECYCLING, WITHOUT DISRUPTING THE EXISTING SUPPLY CHAIN OR INFRASTRUCTURE.

Third-party certification



ISCC

International Sustainability
& Carbon Certification

Why Certification?

- Audit & verification of mass balance and chain-of-custody
- Transparent standards for methodology and claims
- Promote trust and high integrity with stakeholders

Why ISCC PLUS?

- Highly regarded international standard for circular and bio economy
- Multi-stakeholder association (industry, NGO's, academia)
- ~3700 active certificates
- Significant momentum for chemical recycling applications

Eastman is using a highly credible, transparent, well-established and a regularly audited standard for Mass balance.

In conclusion

Solving plastic waste challenges require **collaboration between all players in value chain** with a big picture perspective.

Mass balance accounting framework **is a critical enabler for** driving rapid, large scale, **global circular transformation**.

Full acceptance of Mass balance for driving “recycled content” across value chains could **remove limitations** for brands and other organizations **to meet sustainability goals** by making more recycled materials available and marketable.

To learn more, read the [Ellen MacArthur Foundation CE100 whitepaper](#)

