



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Recommendations for Decarbonization from a Materials Perspective

MATERIALS DECARBONIZATION WORKGROUP, EGLE

Background

Several stakeholders have championed materials related proposals to address decarbonization since the since five advisory workgroups were formed.

EGLE determined there was a need for a materials focused group to process these proposals and develop recommendations to the Council on Climate Solutions that support the just transition to a low carbon economy through a materials management lens.

The group developed a baseline understanding of current materials related emissions and proposes the recommendations in the attached report.

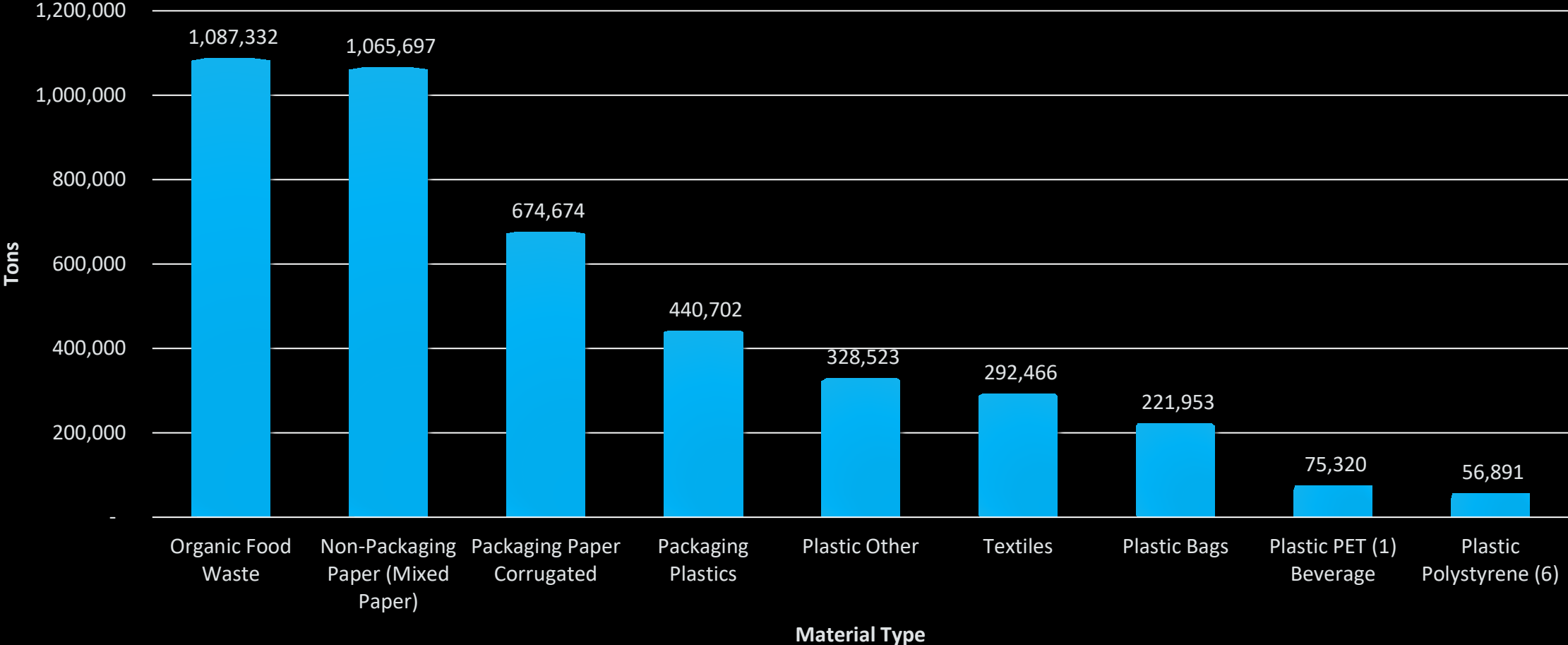
Priority Materials

Michigan generates and landfills approximately 8,000,000 tons annually.

Michigan also imports and landfills additional materials.

We identified the materials on the following chart as high priority materials for decarbonization. This chart excludes approximately half of the total waste generated and disposed in Michigan (including Industrial Waste, Construction & Demolition waste, contaminated soils, and others).

Estimated Total Annual Tons Landfilled by Material



Food Waste

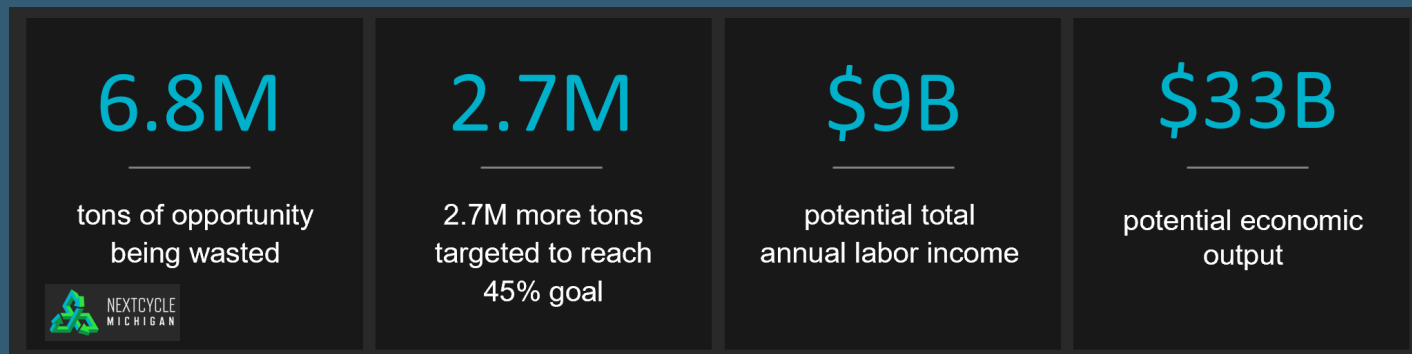
Michigan should formally adopt and pursue the joint USDA/USEPA goal to reduce food loss and waste by half no later than 2030, and actively support municipalities and the private sector in deploying best available composting and anaerobic digestion technologies to divert food and other organics from landfills in a way that protects the environment and public health while creating energy and generating revenue.

- Currently, **509,542.52 metric tons of CO₂e** (MTCO₂e) emissions are generated in Michigan annually from landfilling food waste and an additional **3,979,360 MTCO₂e** emissions are associated with the production and generation of that wasted food.
- Reducing food waste by 15% reduces CO₂e by 673,335 tons.
- Indirect benefits address hunger, equity, and increases soil capacity to sequester carbon.

Circular, Low-Carbon Economy

Michigan should position itself as a global leader in the manufacturing and procurement of low-carbon and circular-economy products.

- Growing Michigan's Circular Economy and tripling our recycling rate would avoid more than **10,355,618 MTCO2e** annually.
- Indirect Benefits address equitable job creation and economic development by creating more livable cities, distributing value more widely in the economy, and spurring innovation.
- Closing the loop has measurable benefits.
 - For example : 4 tons of CO2 is reduced for every ton of corrugated cardboard boxes kept from entering the landfill.



Reducing Landfill Climate impacts

Michigan should require the installation/maintenance of best-available gas capture systems and promote increased use of energy recovery systems at landfills.

- 2,997,526 MTCO₂e could be avoided over 2019 levels through gas capture systems.

Questions?

Additional Circular Economy Information

HOW THE CIRCULAR ECONOMY TACKLES CLIMATE CHANGE

...Putting in place a circular economy is a **fundamental step** towards achieving climate targets.

Offers a systematic response to the crisis by both **reducing emissions and increasing resilience** to its effects.

The benefits encompass meeting other goals such as **creating more livable cities, distributing value** more widely in the economy, and spurring innovation.

IMPACT BY THE TON: RECYCLING AND CARBON

Reuse + Recycle Cardboard Boxes

Save almost 4 tons of CO₂ for every ton of corrugated cardboard boxes kept from entering the landfill.

Recycle Plastic Film

Avoid the upstream energy necessary to produce one ton of new product saves about 2 tons of CO₂ annually.

Recycle Paper

The amount of energy and materials it takes to make a ton of office paper is reduced by 4.3 tons of CO₂ when recycling paper.

Buy Recycled Paper

20 cases of 30% post-consumer recycled content office paper saves 1 ton of CO₂.
Buying just 6 cases of 100% recycled paper also saves 1 ton of CO₂.

MICHIGAN'S RECYCLING PATH FORWARD

6.8M

tons of opportunity
being wasted

2.7M

2.7M more tons
targeted to reach
45% goal

\$9B

potential total
annual labor income

\$33B

potential economic
output

TONS OF MSW DISPOSED IN MICHIGAN

MSW DISPOSAL STREAM

Total 8.012 Million Tons



Mixed Recyclables

Other Recyclables

Organics & Compostables

Non-Recoverable

NEXTCYCLE MICHIGAN CLIMATE POTENTIAL

7M

Additional mTCO₂e
tons avoided at
45% goal

300K

Additional mTCO₂e
tons avoided at 45%
goal for organics

700K

Additional mTCO₂e
tons avoided at 14% food
waste reduction

760K

GHG equivalent
to # of household
energy consumption