

A collage of various recycled materials including cardboard, plastic, metal, and paper. The top half shows a close-up of a cardboard egg carton, a crumpled blue paper ball, a green plastic bottle, and a purple paper flower. The bottom half shows a yellow mesh net, a crumpled yellow paper ball, a clear plastic bottle, and a green mesh net.

Materials, Recycling, the Waste Hierarchy and Climate

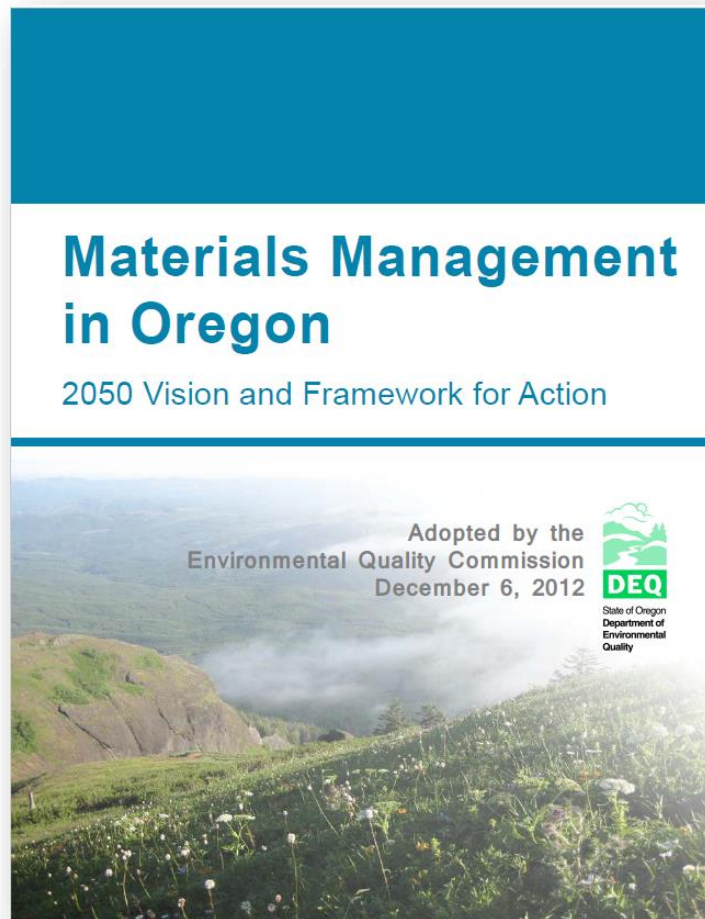
*David Allaway, Oregon Department of Environmental Quality
Northeast Recycling Council – Tuesday October 7*

Materials matter!

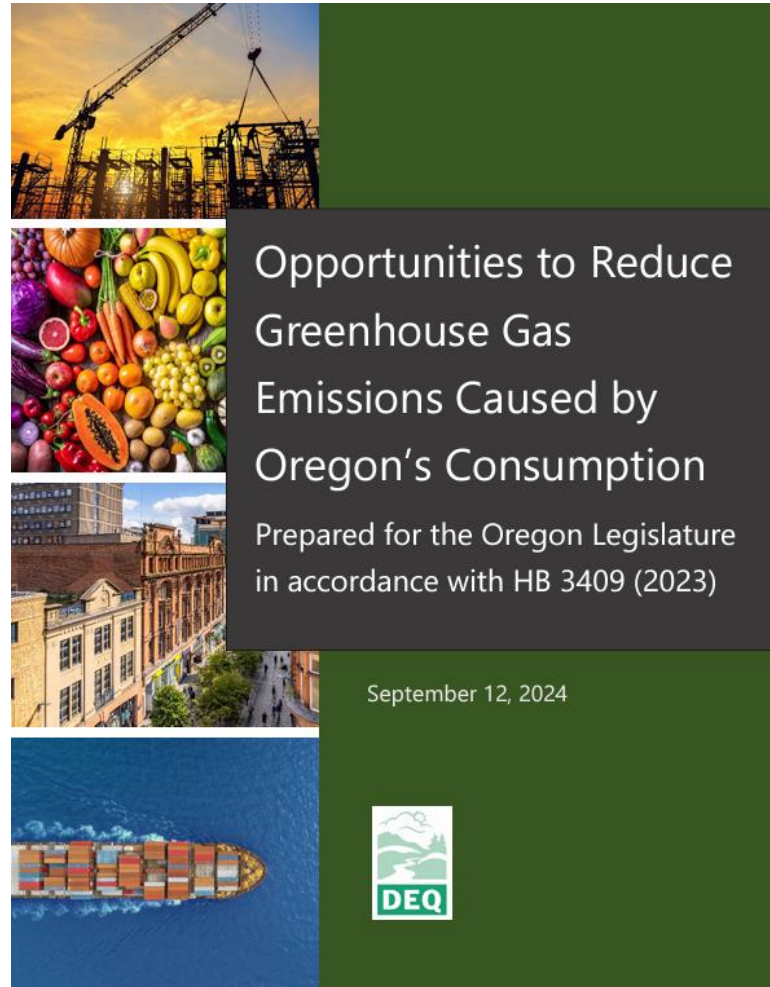
Most impacts occur *upstream* of use and disposal

**Recycling and composting can be helpful,
but alone are *insufficient***

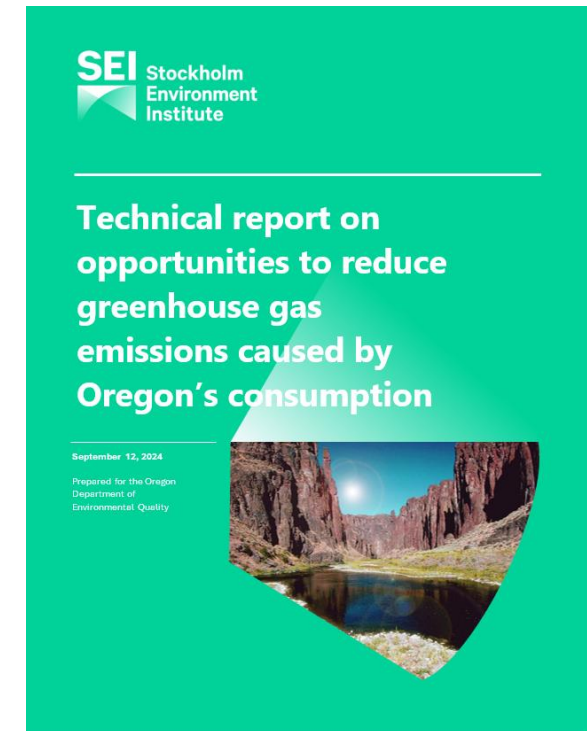
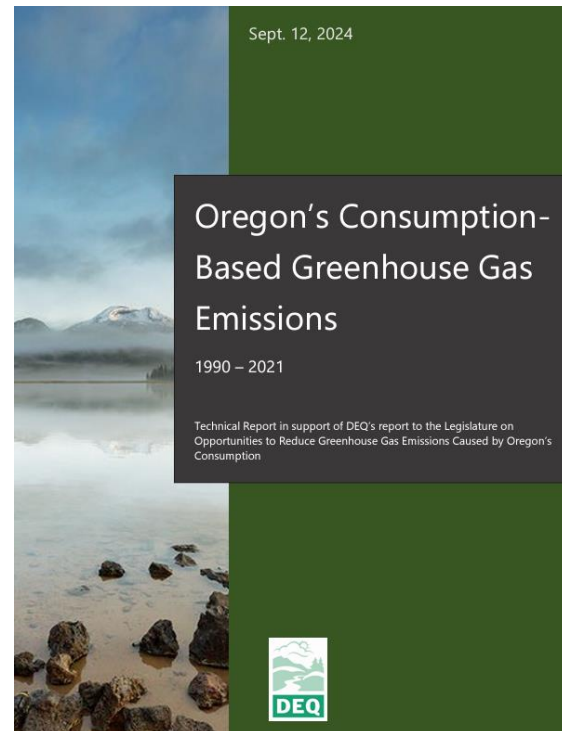
Oregon's 2050 Vision and Framework for Action



2024 Reports on Materials and Climate



Companion Technical Reports



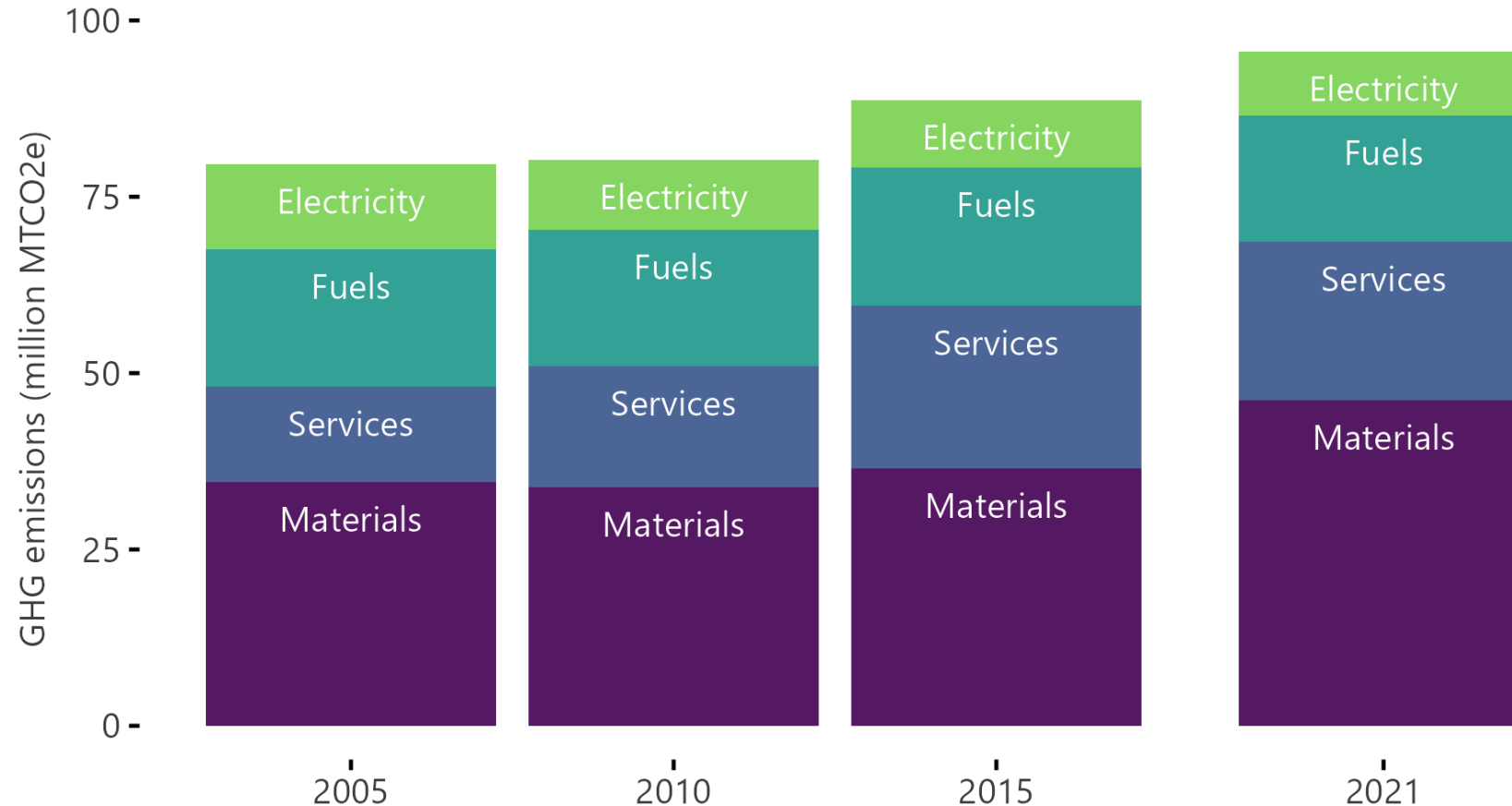
All available at:

www.oregon.gov/deq/mm/pages/consumption-based-ghg.aspx

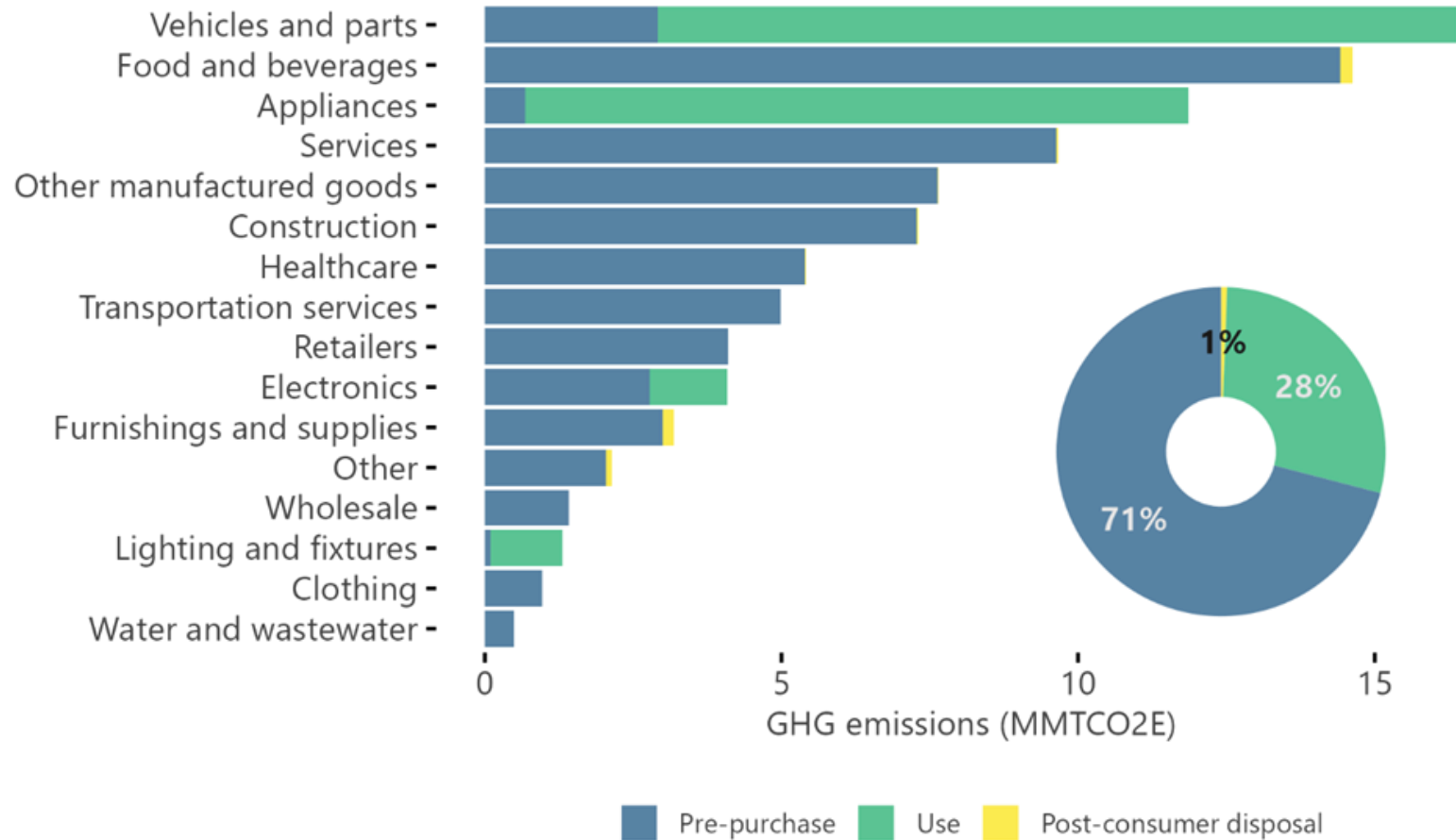
Materials are driving growth in emissions

Changes in Oregon's consumption-based impacts, 2005-2021

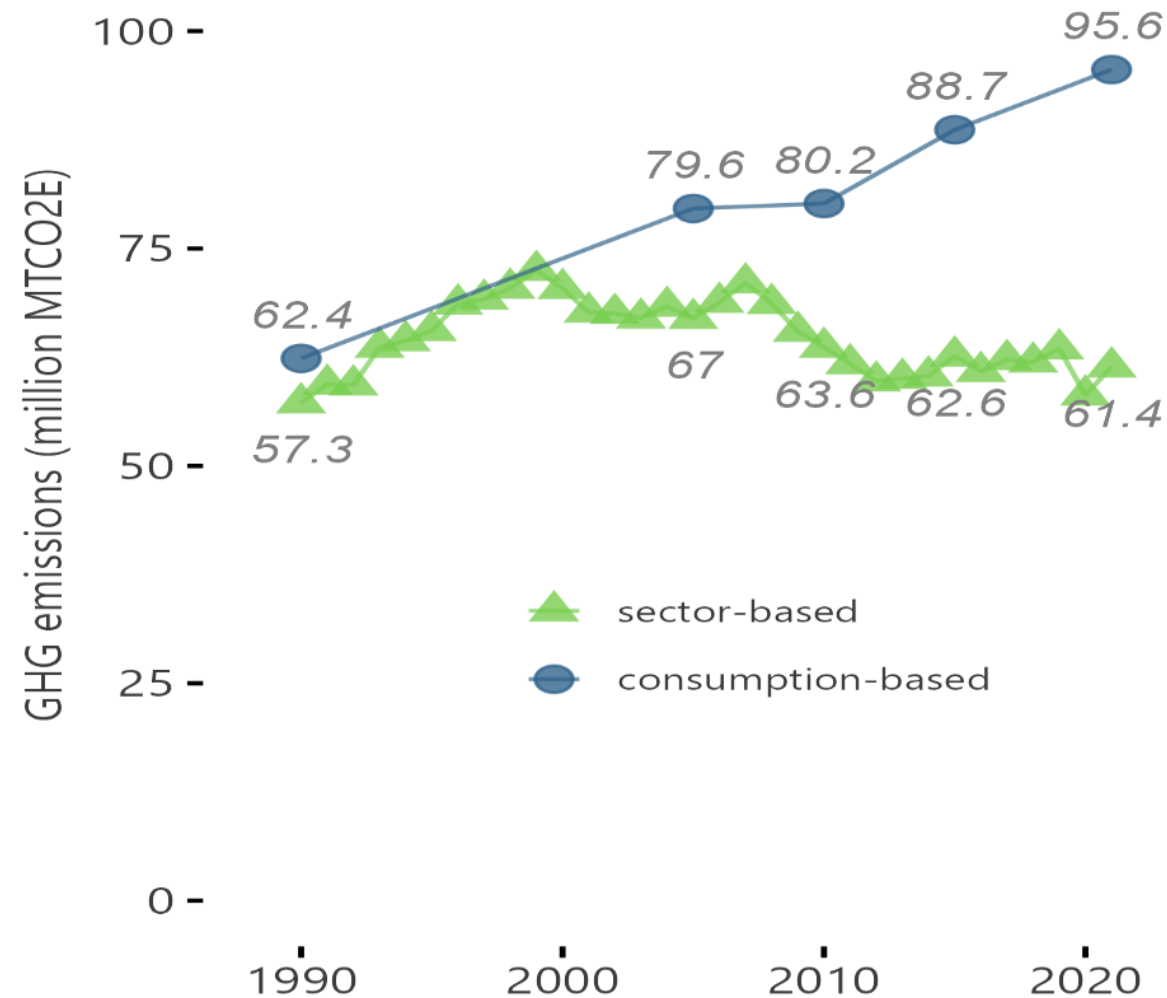
by metacategory



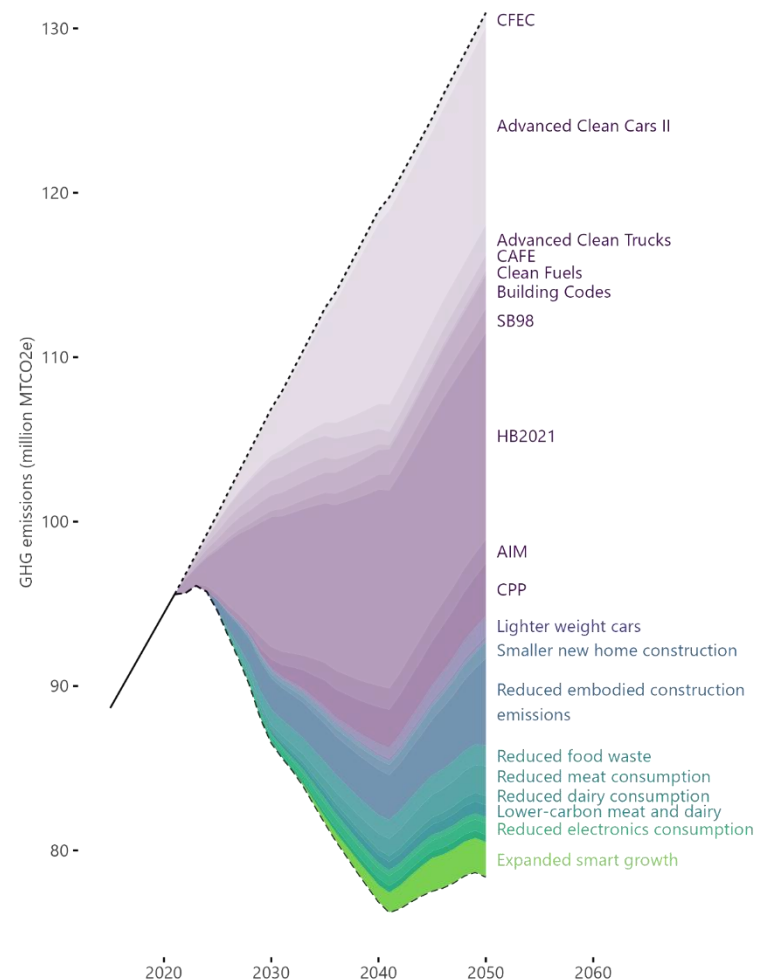
Most emissions occur pre-purchase



Sector-based emissions have flattened while consumption-based emissions have grown



Emissions are out-of-state, but not out-of-reach

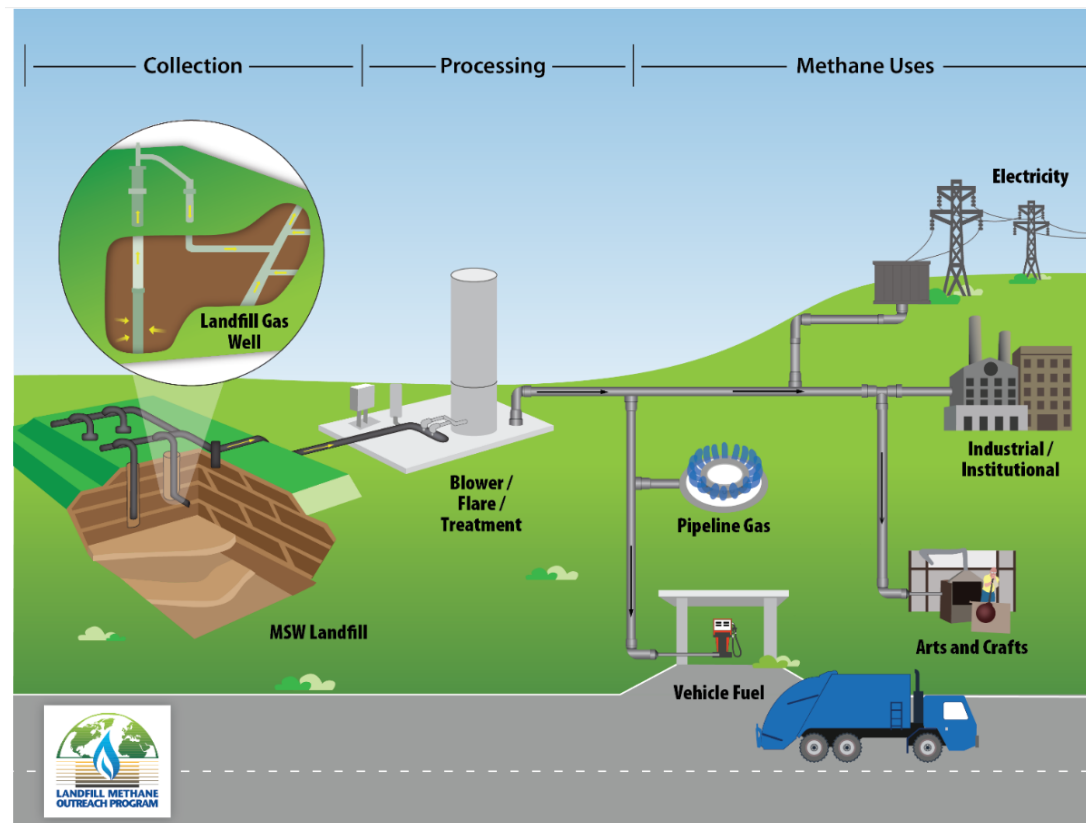
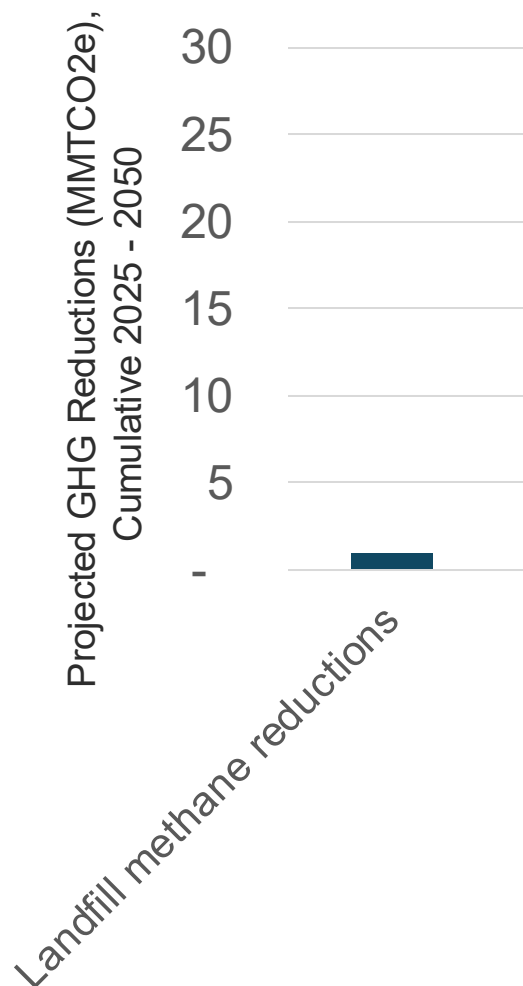


Oregon Comprehensive Climate Action Plan – Preliminary Modeling (2025) of Emission Reduction Potential

Projected GHG Reductions (MMTCO₂e),
Cumulative 2025 - 2050

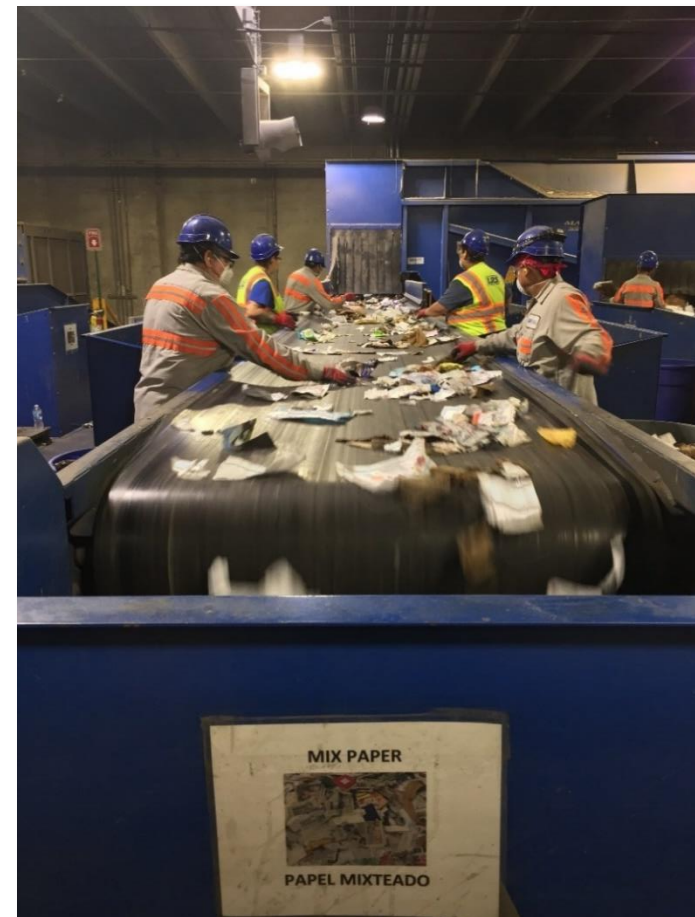
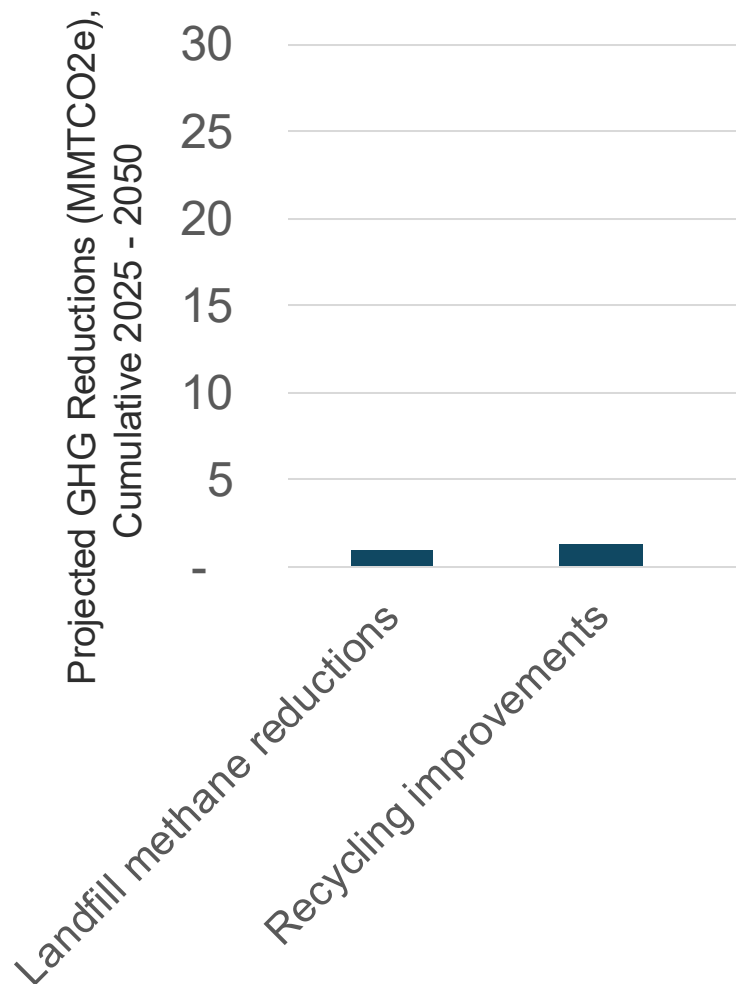
30
25
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Oregon Comprehensive Climate Action Plan – Preliminary Modeling (2025) of Emission Reduction Potential



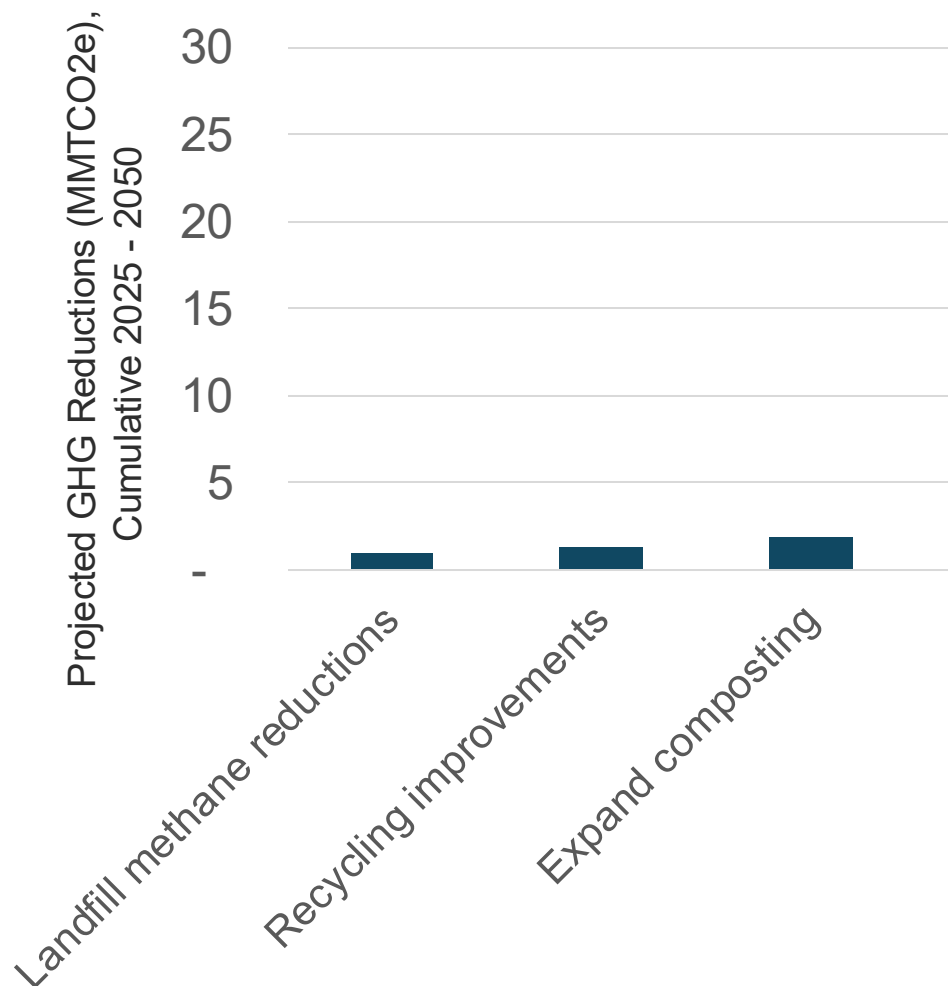
U.S. EPA

Oregon Comprehensive Climate Action Plan – Preliminary Modeling (2025) of Emission Reduction Potential

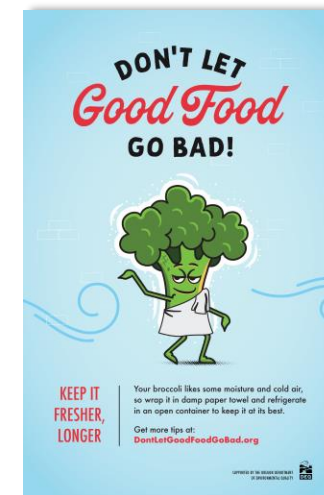
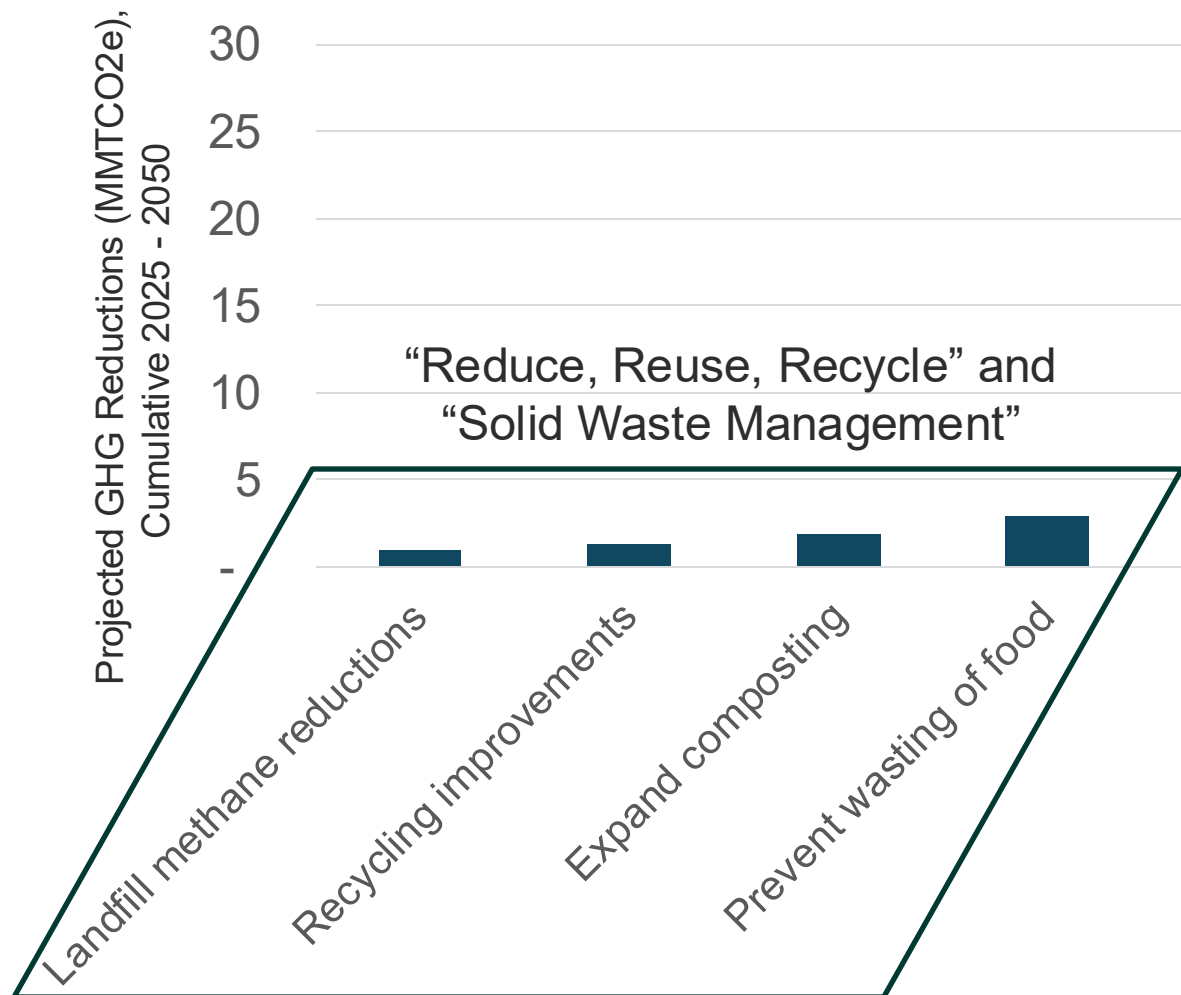


Justin Gast

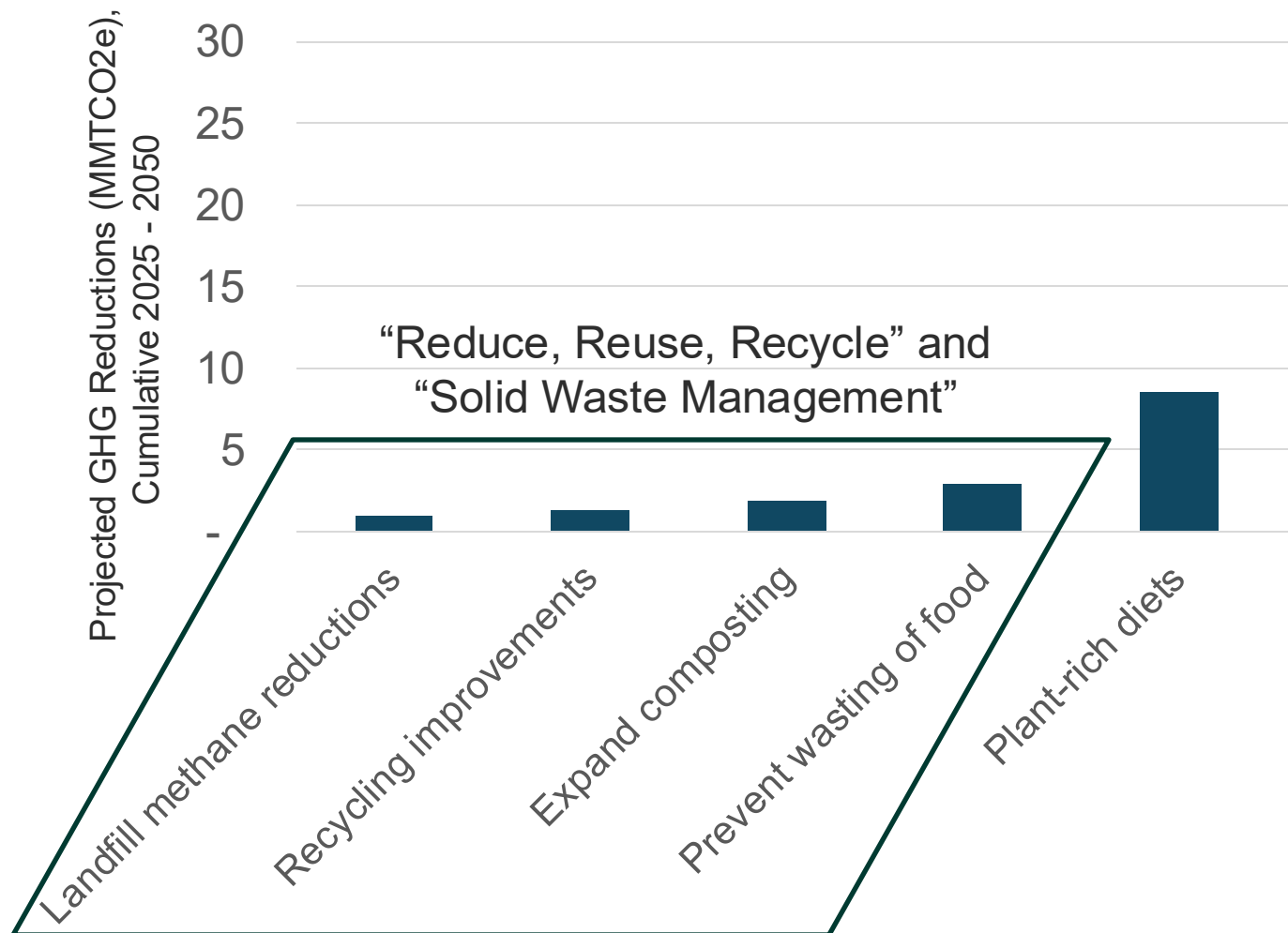
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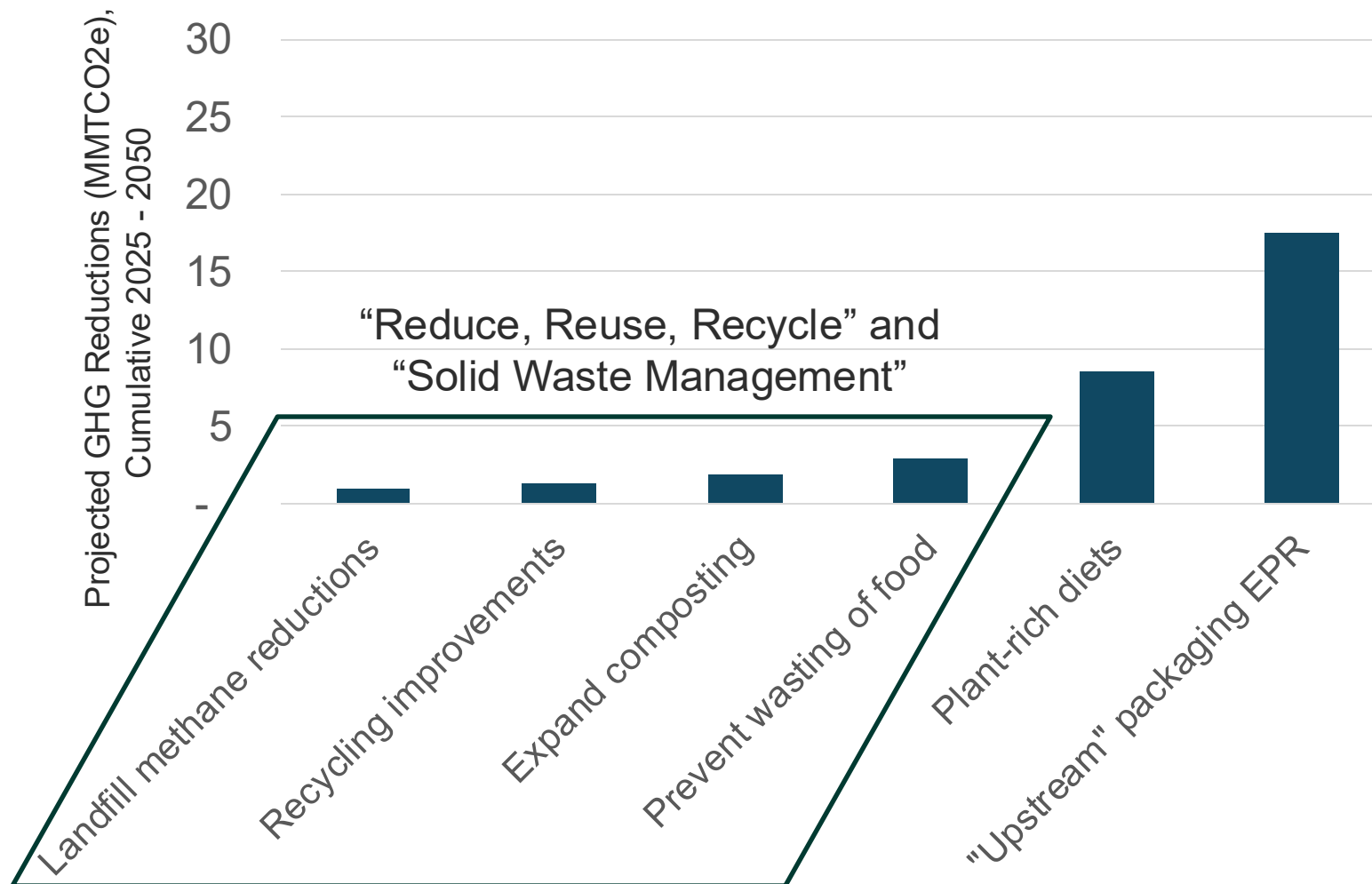
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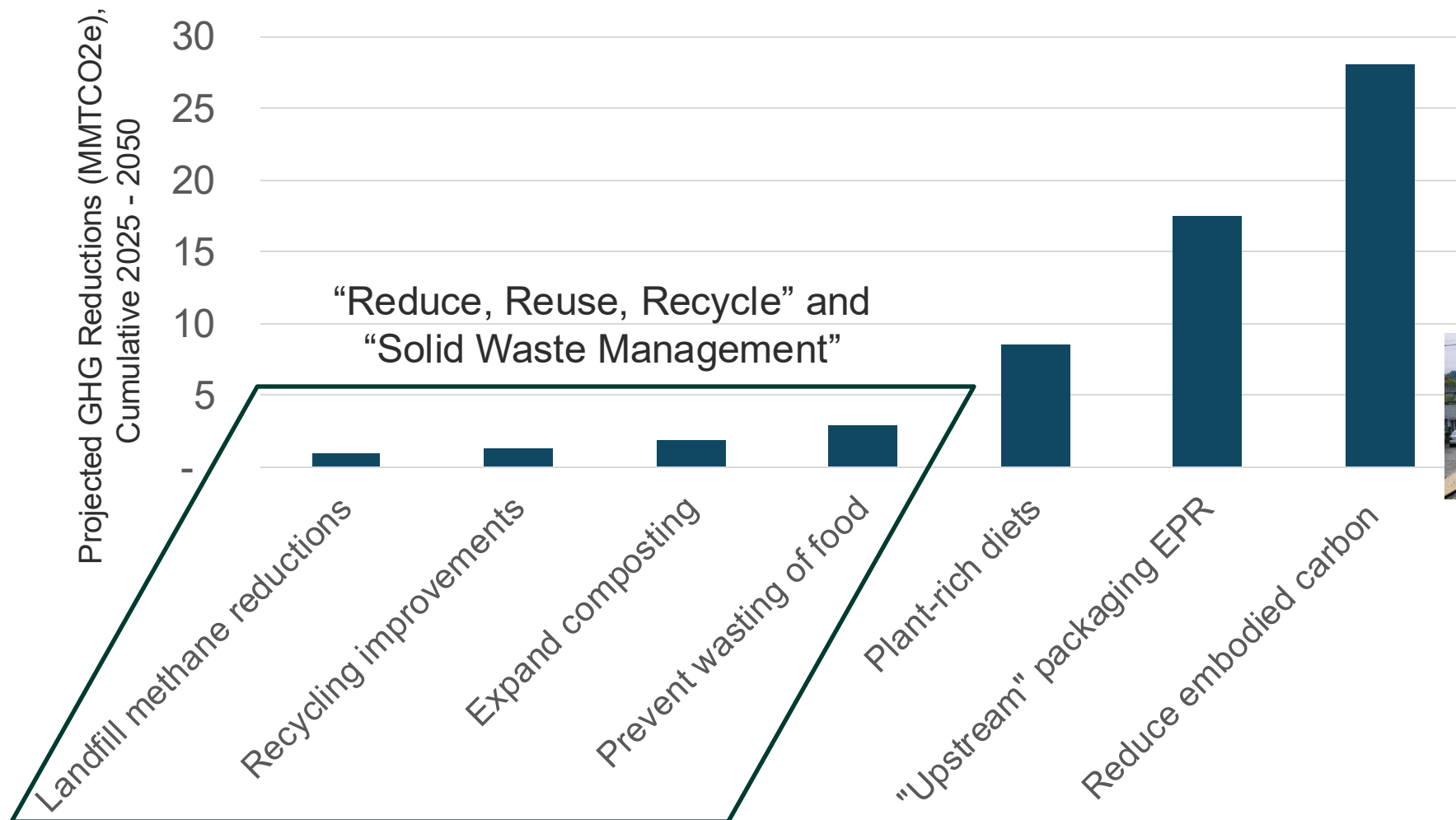
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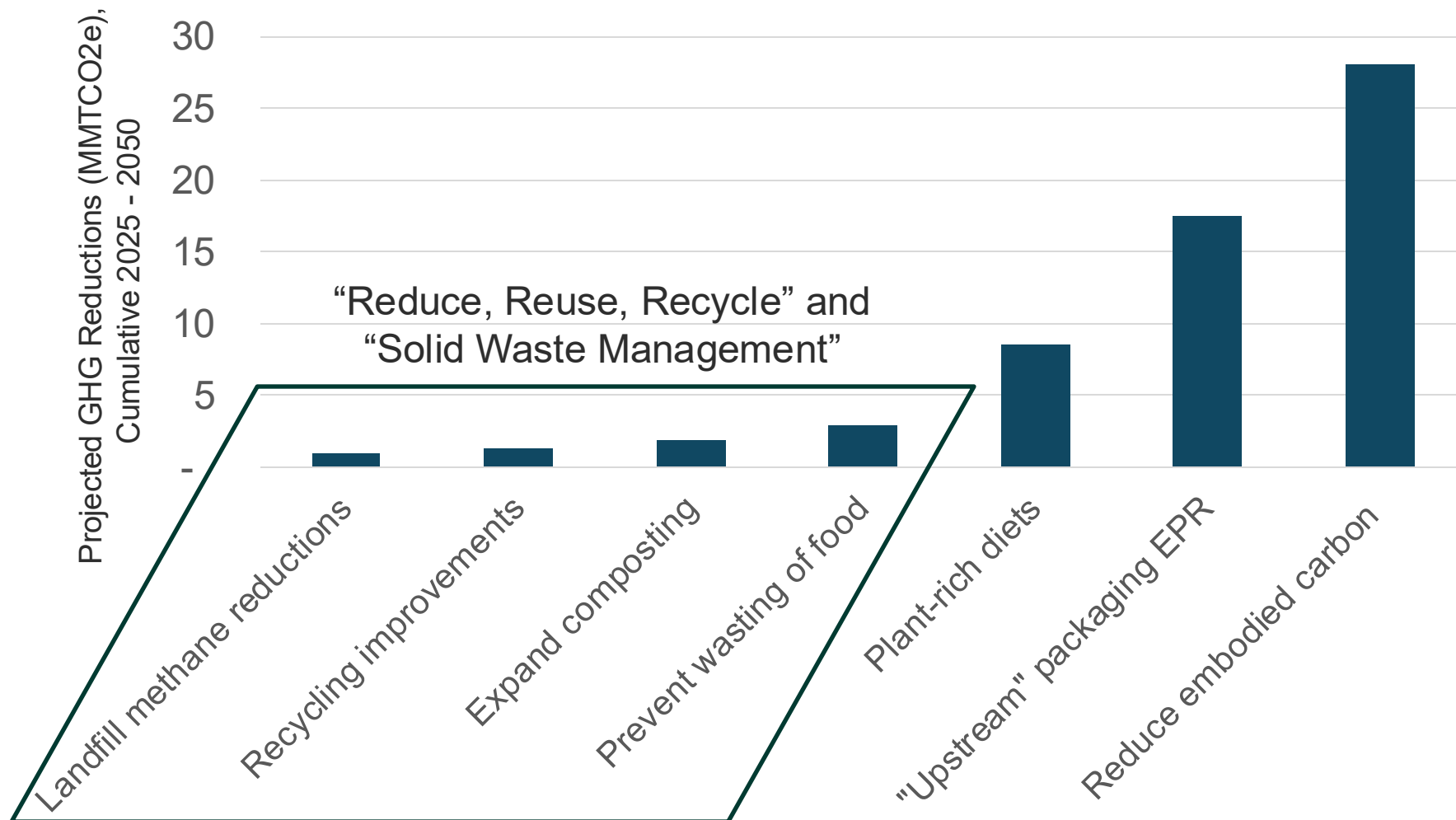
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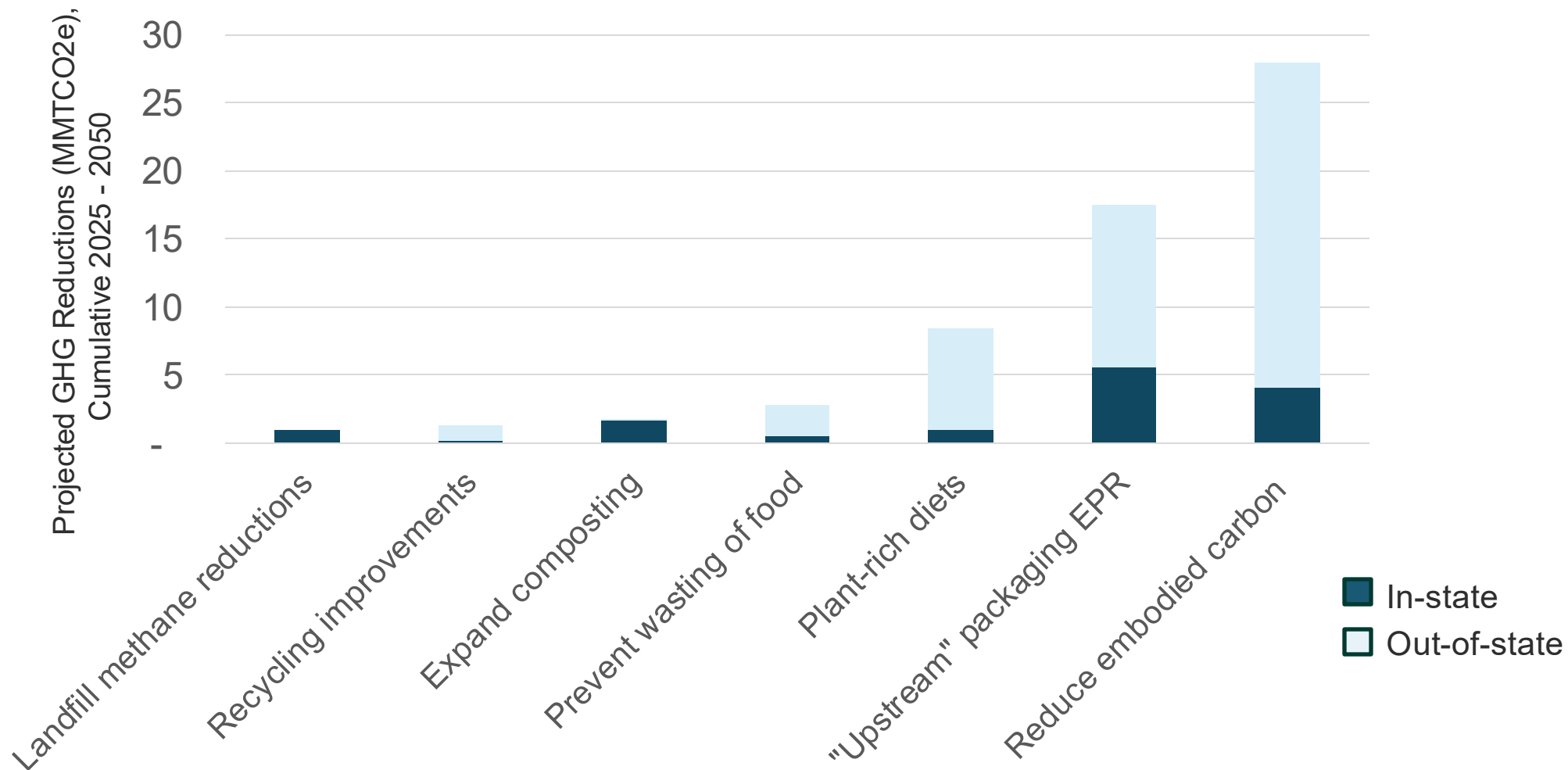
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Recycling

- Not all materials are equally beneficial to recycle
- Not all recycling pathways are equally beneficial
- Maximizing recycling is not the same as optimizing recycling (for climate or other environmental benefits)



EPA's coffee packaging analysis

Coffee Packaging (11.5 oz product)	Recyclable postconsumer?	Energy Consumption (MJ/11.5 oz.)	CO2 eq Emissions (lbs/11.5 oz)	MSW Waste Generated (lbs./ 100,000 oz. of product)
	Steel can – yes Plastic lid – no	4.21	0.33	1,305
	Plastic container – yes Plastic lid - no	5.18	0.17	847
	Flexible pouch - no	1.14	0.04	176

Life cycle impacts vs. material attributes

[attributes]

biobased content

recycled content

recyclable

compostable

[impacts]

cumulative energy demand

freshwater consumption

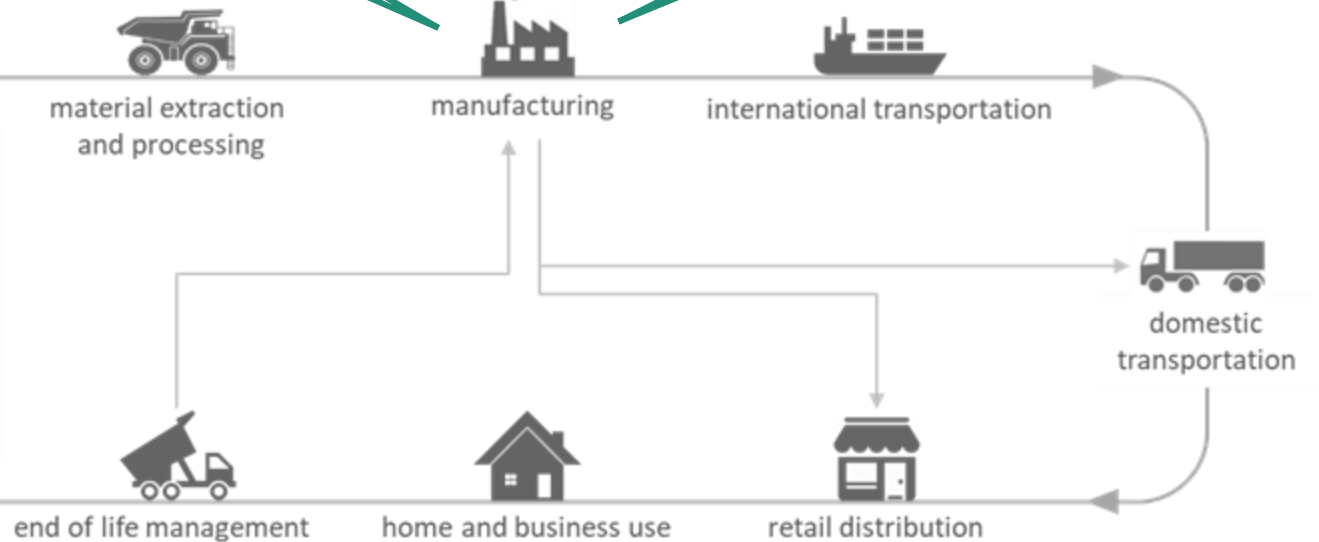
global warming potential

ozone depletion

human health

aquatic toxicity

eutrophication...

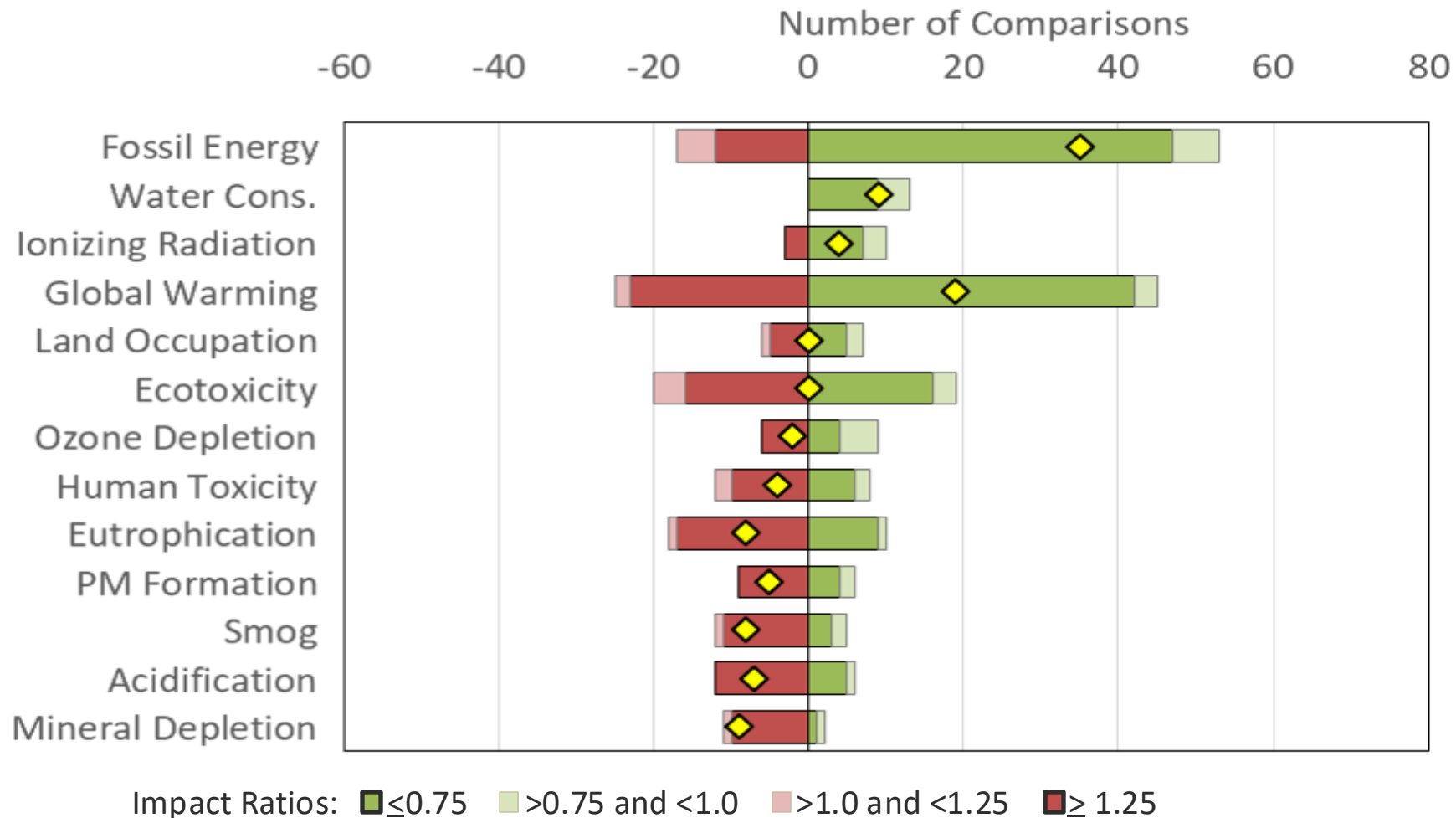


Oregon's research question (2016)

How well (and when) do popular material **attributes** correlate with **reduced** environmental impacts?

<https://www.oregon.gov/deq/mm/production/Pages/Materials-Attributes.aspx>

Comparing different packages based on *recyclability*



To recap . . .

Materials matter!

Most impacts occur *upstream* of use and disposal

**Recycling and composting can be helpful,
but alone are *insufficient***

Thank you

David Allaway

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