



Thank you for
joining!

We will get
started in a few
minutes.

Life Cycle Assessment Summary Report Stakeholder Meeting
September 10, 2026

Reminder

Instructions

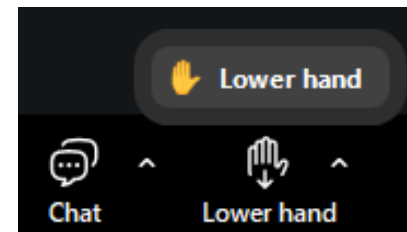
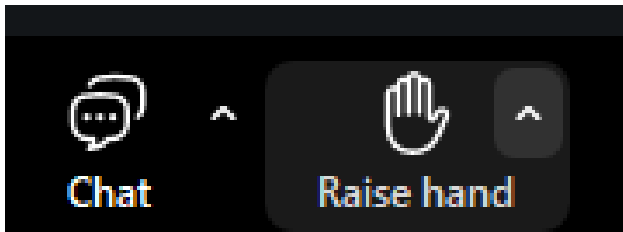
- Mute/Un-Mute and Camera Options.



Reminder Continued

Instructions

- If you have questions, please use the raise hand feature or type the question in the chat



Introductions

DNR Staff

Jennifer Wright

FABA Supervisor

Tom Anderson

Executive Officer II

Julie Ritter

Environmental Specialist Sr

SCS Staff

Jeff Phillips

Senior Project Manager

Ketan Shah

Project Manager

Junyi Du

Senior Staff Professional

Hannah Sperfslage

Senior Staff Professional

Today's Agenda

1

**Welcome, Project Background
& Goals**

10:30 – 10:40

2

LCA Methods

10:40 – 10:55

3

LCA Results

10:55 – 11:40

4

LCA Results Alternative Scenarios

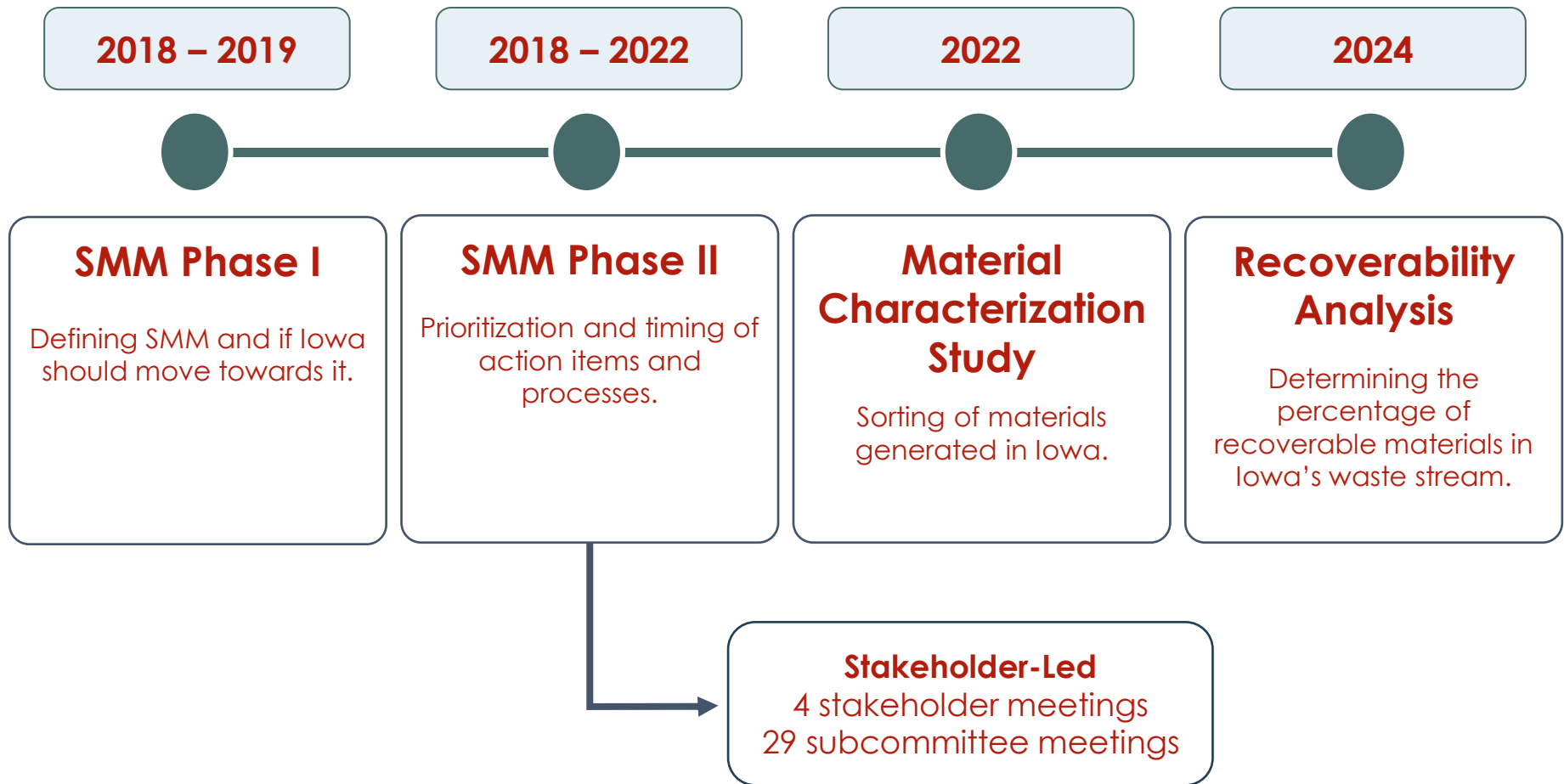
11:40 – 12:15

5

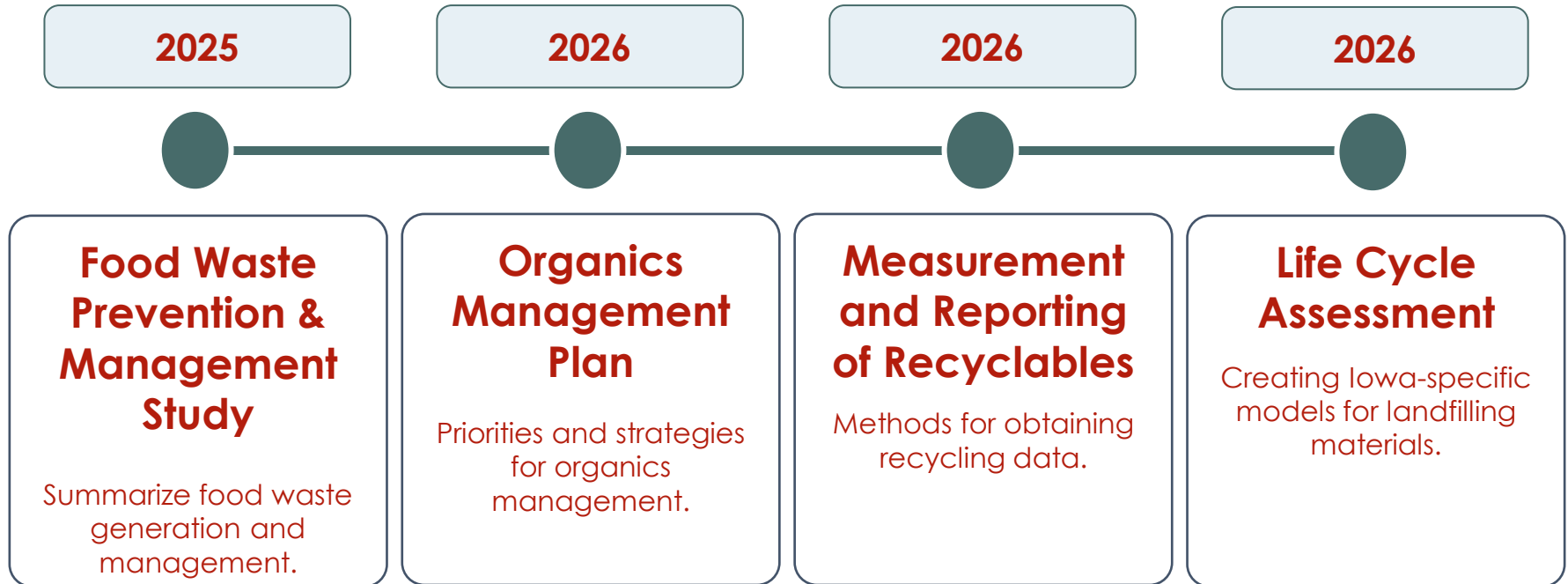
Closing Statements

12:15 – 12:30

SMM Timeline



SMM Timeline Continued





Project Background & Goals

What is Life Cycle Assessment?

What is a Life Cycle Assessment (LCA)

An LCA evaluates a product's environmental impacts across its entire life cycle – from raw material extraction through end-of-life management

Why Conduct an LCA?

An LCA gives the complete picture of environmental impacts, helping identify where we can reduce impacts, improve outcomes, and build a better tomorrow.

What is Life Cycle Assessment?

Continued



WHY AN LCA MATTERS



Identify hotspots

Pinpoint the greatest environmental impacts across the life cycle.



Drive improvement

Focus efforts where changes can make the greatest difference.



Build a sustainable future

Use resources more efficiently and reduce impacts over time.



Support smarter decisions

Provide reliable data to guide products, policies and strategies.

Project Goals

Identify environmental impacts of specific products

Create an Iowa-specific environmental baseline

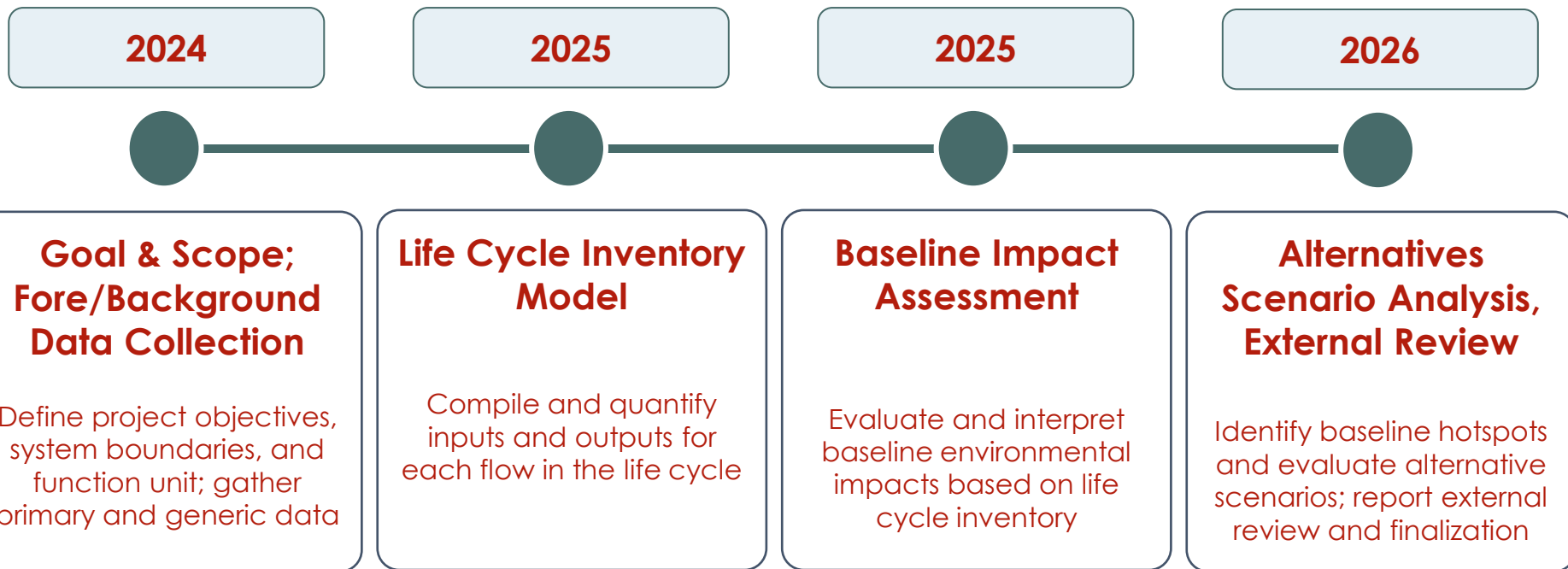
Identify “hot spots” or opportunities to reduce environmental impacts

Measure potential environmental impacts of alternative waste management scenarios

Inform stakeholders

Support policy evaluation and planning

LCA Project Timeline



Scope – Four Waste Materials



Aluminum Containers



Food Waste



Plastic Film Waste



Textiles and Leather Waste

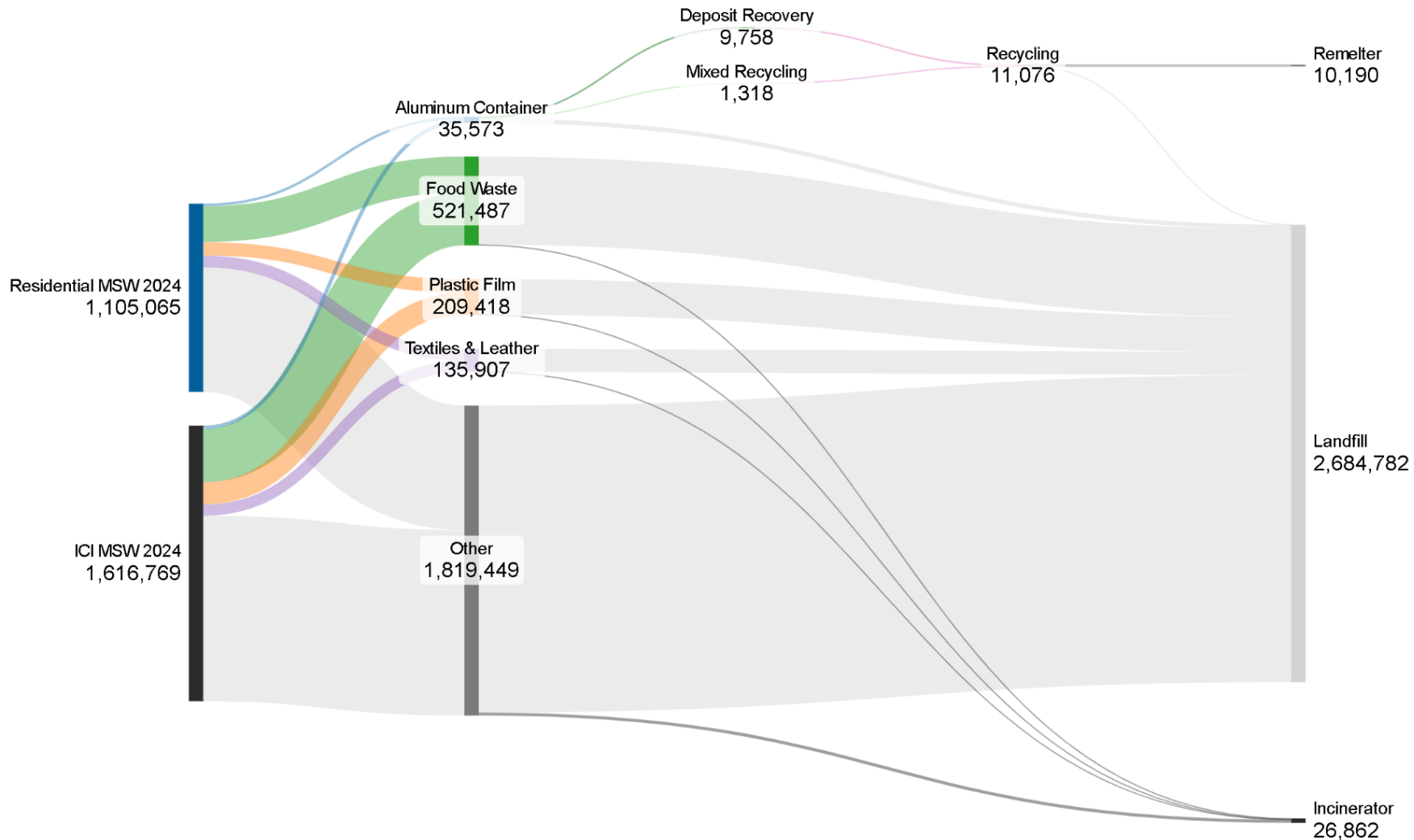
Scope – Four Waste Materials Continued

2022		2017		2011		2005		1998	
Pct.	Material	Pct.	Material	Pct.	Material	Pct.	Material	Pct.	Material
19.2%	Food Waste ¹	20.0%	Food Waste ¹	13.3%	Food Waste	10.6%	Food Waste	10.7%	Food Waste
7.7%	Plastic Film ²	8.7%	Plastic Film ²	9.0%	OCC and Kraft Paper	8.5%	OCC and Kraft Paper	10.3%	Non-Rec. Paper
7.5%	OCC and Kraft Paper	7.6%	Compostable Paper	6.7%	Plastic Film ²	7.0%	Mixed Rec. Paper	8.5%	OCC and Kraft Paper
5.5%	Fines	6.1%	Mixed Rec. Paper	6.1%	Compostable Paper	6.6%	Plastic Film ²	7.5%	Other Plastic Products
5.0%	Textiles and Leather	4.8%	Fines	5.4%	Untreated Wood	6.5%	Compostable Paper	5.4%	Mixed Rec. Paper
5.0%	Compostable Paper	4.6%	OCC and Kraft Paper	5.4%	Construction/Demolition ³	6.0%	Other Plastic Products	5.2%	Fines
4.9%	Wood - Treated	4.1%	Other Organic	5.3%	Other Plastic Products	5.5%	Construction/ <u>Demolition</u> ³	4.8%	Construction / Demolition ³
4.4%	Mixed Recyclable Paper	4.1%	Textiles and Leather	4.6%	Yard Waste	4.9%	Textiles and Leather	4.8%	Plastic Film
3.0%	Diapers	3.5%	Diapers	4.1%	Textiles and Leather	4.6%	Wood - Treated	4.2%	Textiles and Leather
2.9%	Other Ferrous Scrap Metals	3.1%	Other Plastic Products	3.8%	Wood - Treated	4.0%	Newsprint	3.6%	Wood - Treated
65.1%	2022 Cumulative Percent	66.6%	2017 Cumulative Percent	63.4%	2011 Cumulative Percent	64.2%	2005 Cumulative Percent	65.0%	1998 Cumulative Percent

Scope – Four Waste Materials Continued 2



MSW Management Pathways



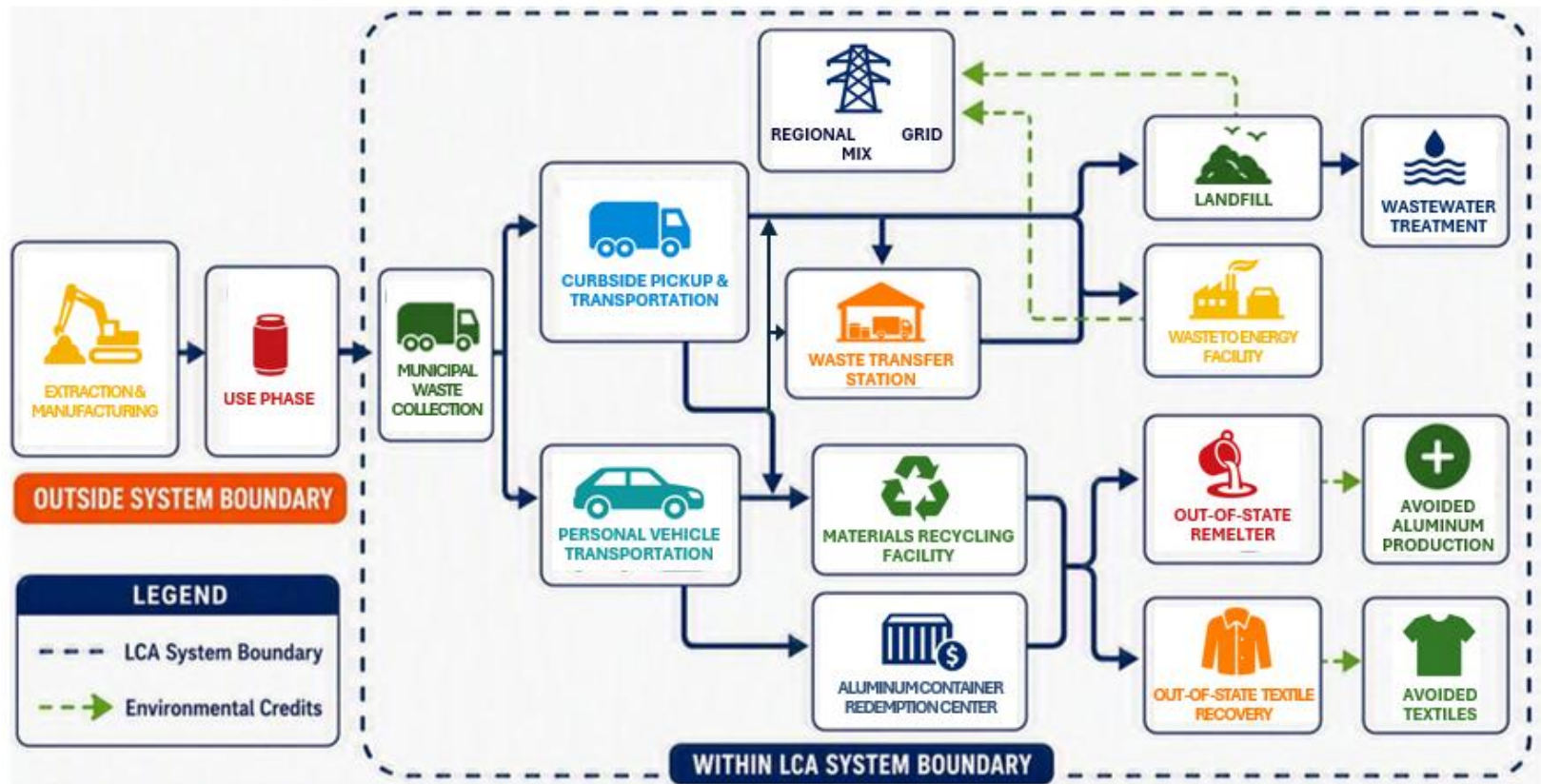


LCA Methods

System Boundary



Scope – Cradle Gate and Gate to Grave for the State of Iowa

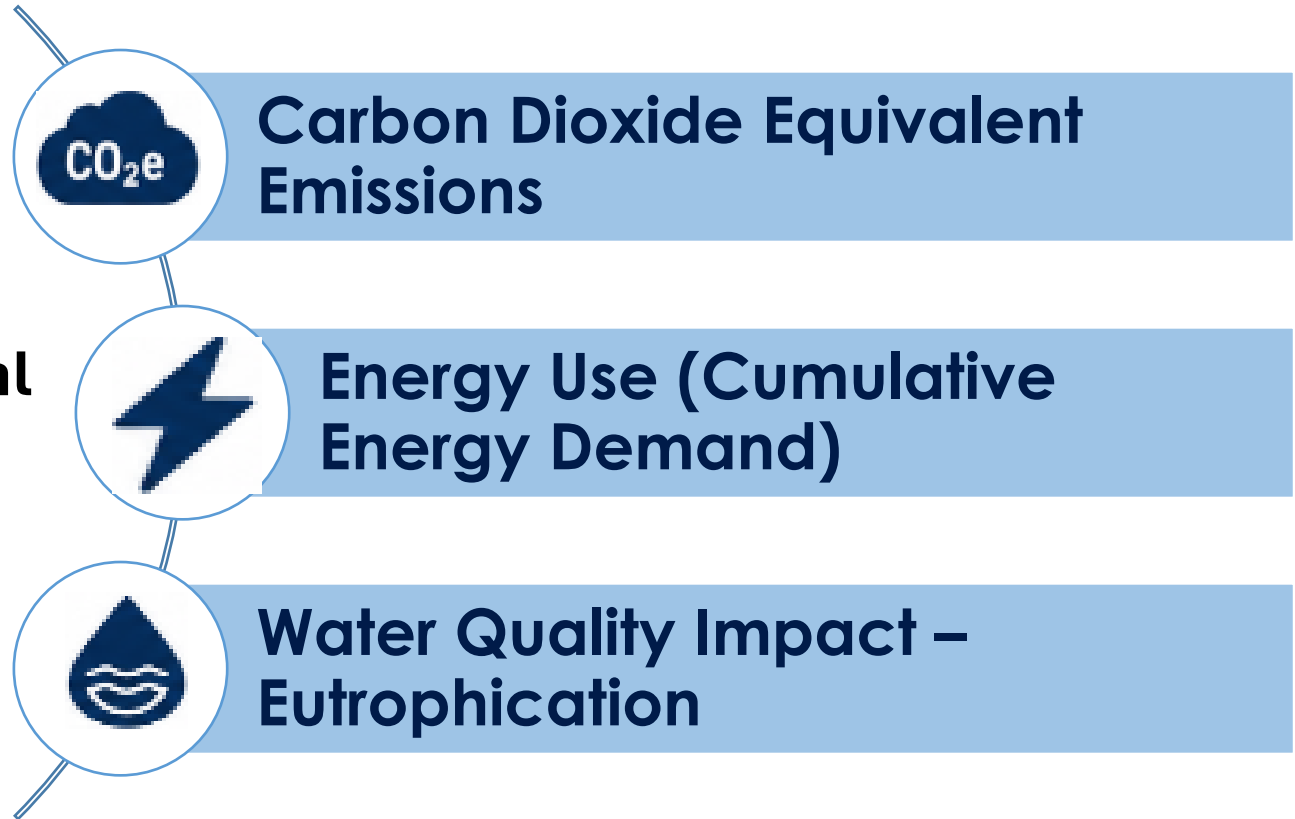


Methodology Overview

- Methods:
 - ISO 14040/14044
 - OpenLCA 2.5.0 with Ecoinvent 3.11 Cut-off Database
 - LCI Standard Core Data Quality Metrics
- Data sources:
 - Iowa Statewide Material Characterization Study (2022)
 - Food Waste Prevention & Management Study Report
 - Recycling Partnership Study (2024)
 - Iowa Recycling Facility Study
 - Peer-reviewed publications and reports from similar studies
- All data reviewed for quality, representativeness, and reliability

Methodology Overview Continued

Measured Environmental Impacts

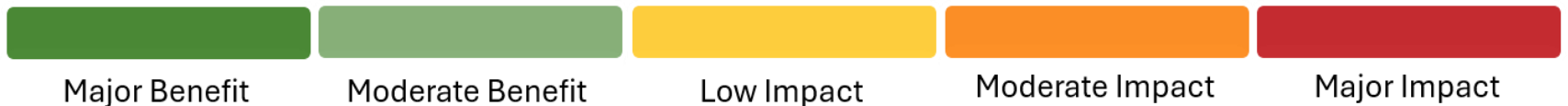




LCA Baseline Results

Baseline Results – Scoreboard

WASTE MATERIALS		 CO ₂ -eq emissions (t CO ₂ -eq/year)	 Cumulative energy demand (TJ/year)	 Water quality impacts (kg N-eq/year)
	Aluminum Containers	-87,988	-1,323	-33,531
	Food Waste	491,055	288	-575
	Plastic Film Waste	37,183	212	7,603
	Textiles & Leather Waste	42,927	126	7,474



Baseline – Relatable Term, Emissions

Converting Emissions Into Everyday Terms



Aluminum Containers

-19,128

passenger vehicles
removed annually



Avoided
Emissions



Food Waste

106,751

passenger vehicles
annually



Major
Emissions
Impact



Plastic Film Waste

8,063

passenger vehicles
annually



Low
Emissions
Impact



Textiles & Leather Waste

9,332

passenger vehicles
annually



Low
Emissions
Impact

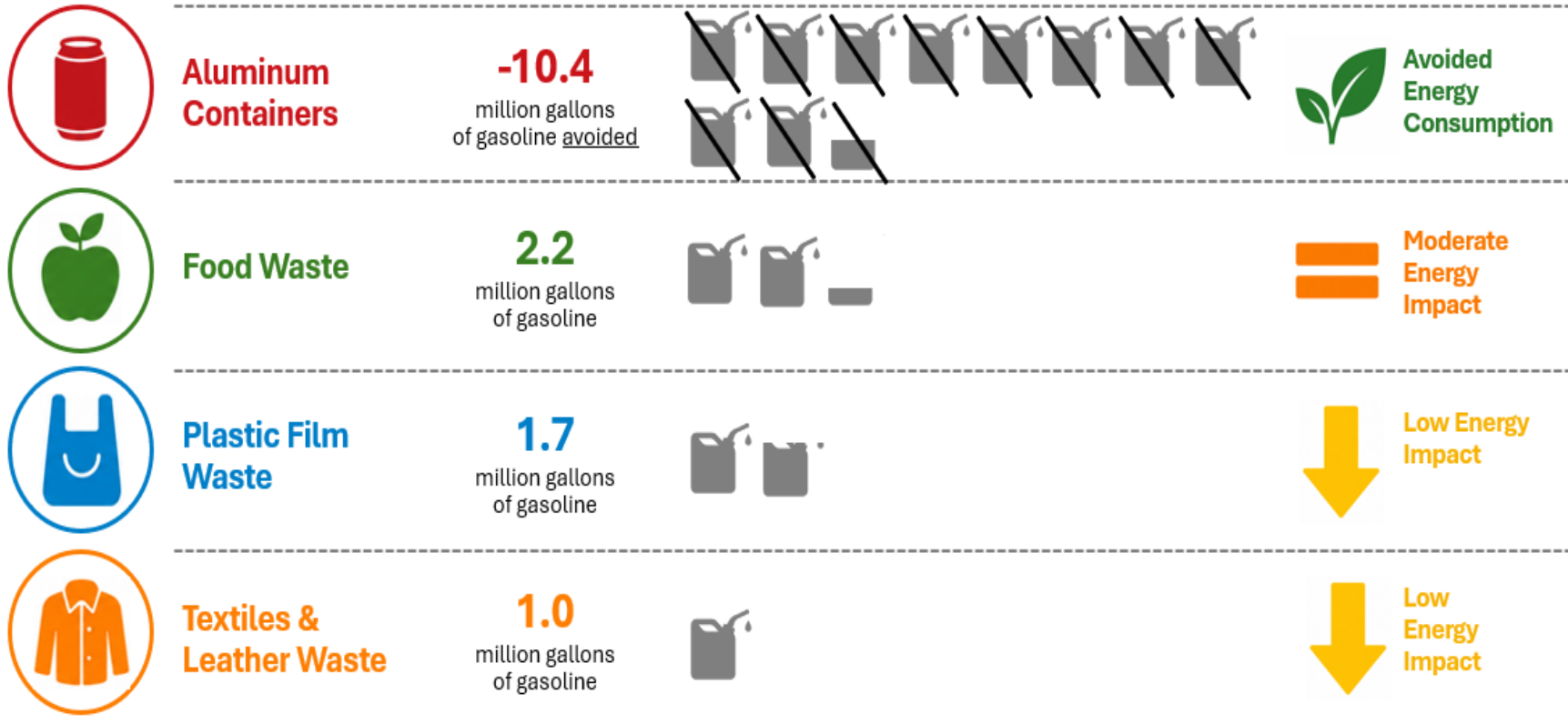
These figures show the equivalent number of passenger vehicles driven for one year.

1 passenger vehicle driven for one year = 4.7 metric tons. CO₂e

Results reflect statewide impacts across Iowa.

Baseline – Relatable Term, Energy

Converting Energy Into Everyday Terms



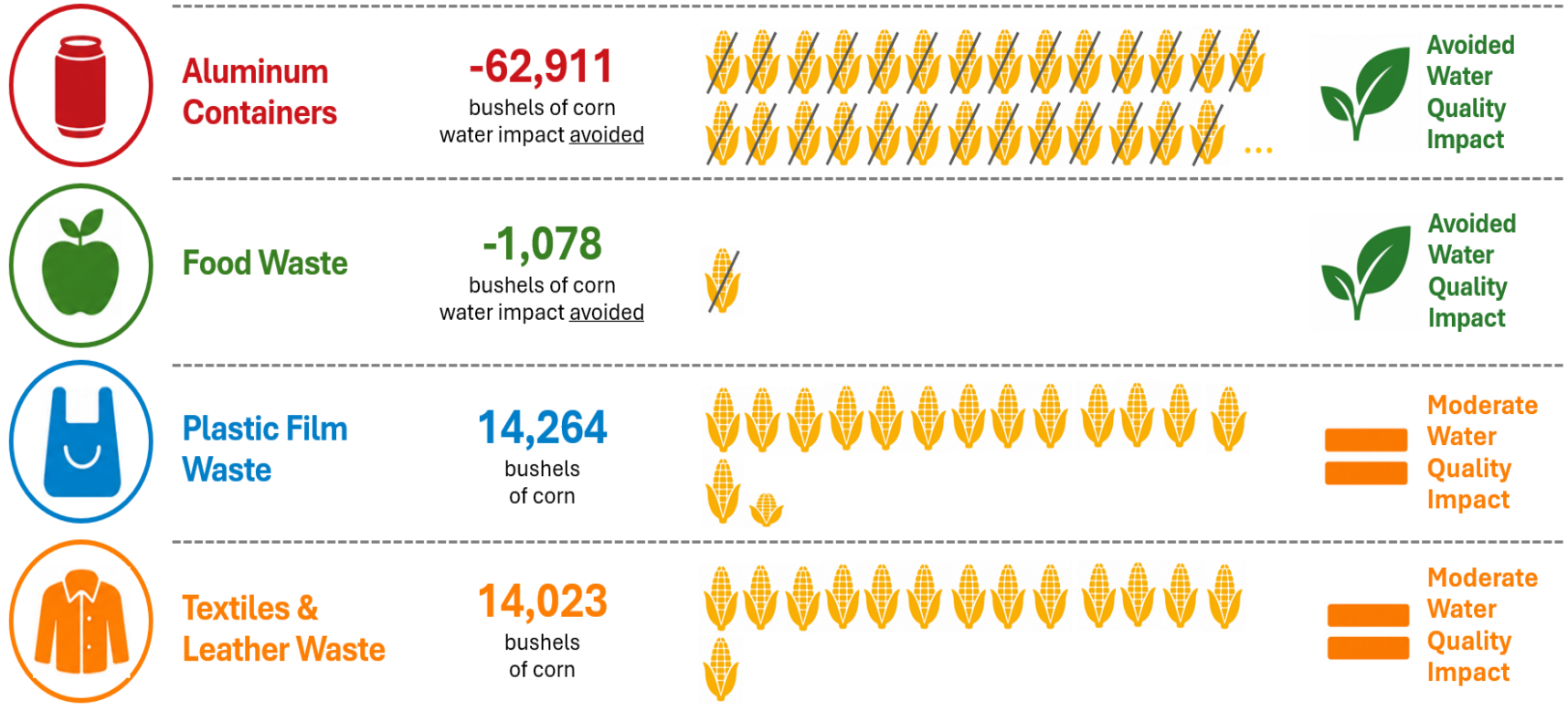
These figures show the equivalent energy content of gasoline needed to produce the same amount of energy.

1 gallon of gasoline = 126.8 megajoules

Results reflect statewide impacts across Iowa.

Baseline – Relatable Term, Eutrophication

Converting Eutrophication Impact Into Everyday Terms



These figures translate eutrophication impacts into the equivalent nitrogen associated with producing bushels of corn.

1 bushel of corn = 0.533 kg nitrogen eq.

Results reflect statewide impacts across Iowa.



Alternative Scenario Analysis

Alternative Scenarios



Increased Deposit Aluminum Deposit Container Recovery Rate
(from 42% to 64%)

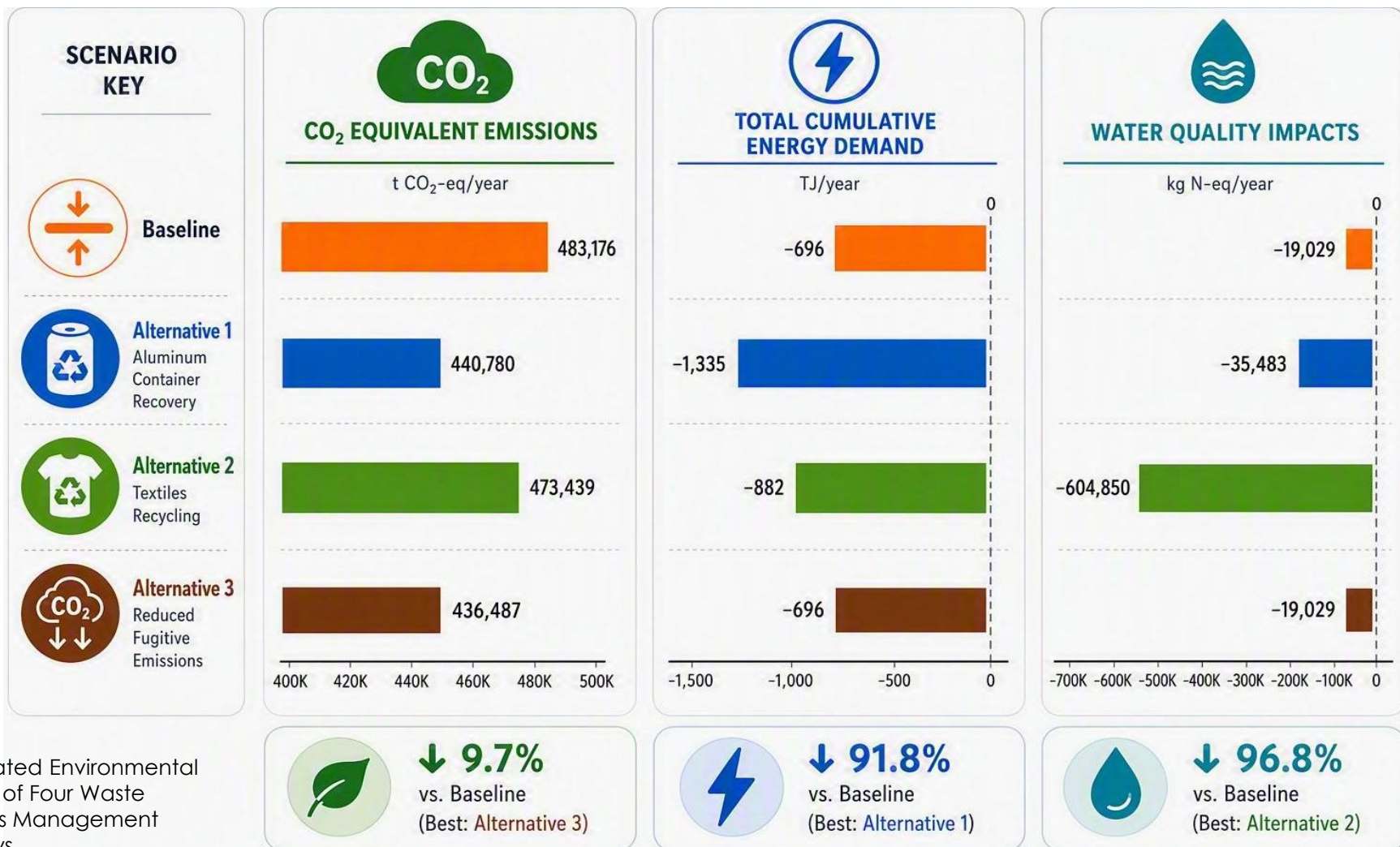


Centralize Residential Textile Collection for Out of State Recycling
(15% Diversion, 100% virgin materials that can be substituted with recycled materials, 20% Recycling & Processing Loss)



Reduction of Landfill Fugitive Methane Emissions (10% reduction)

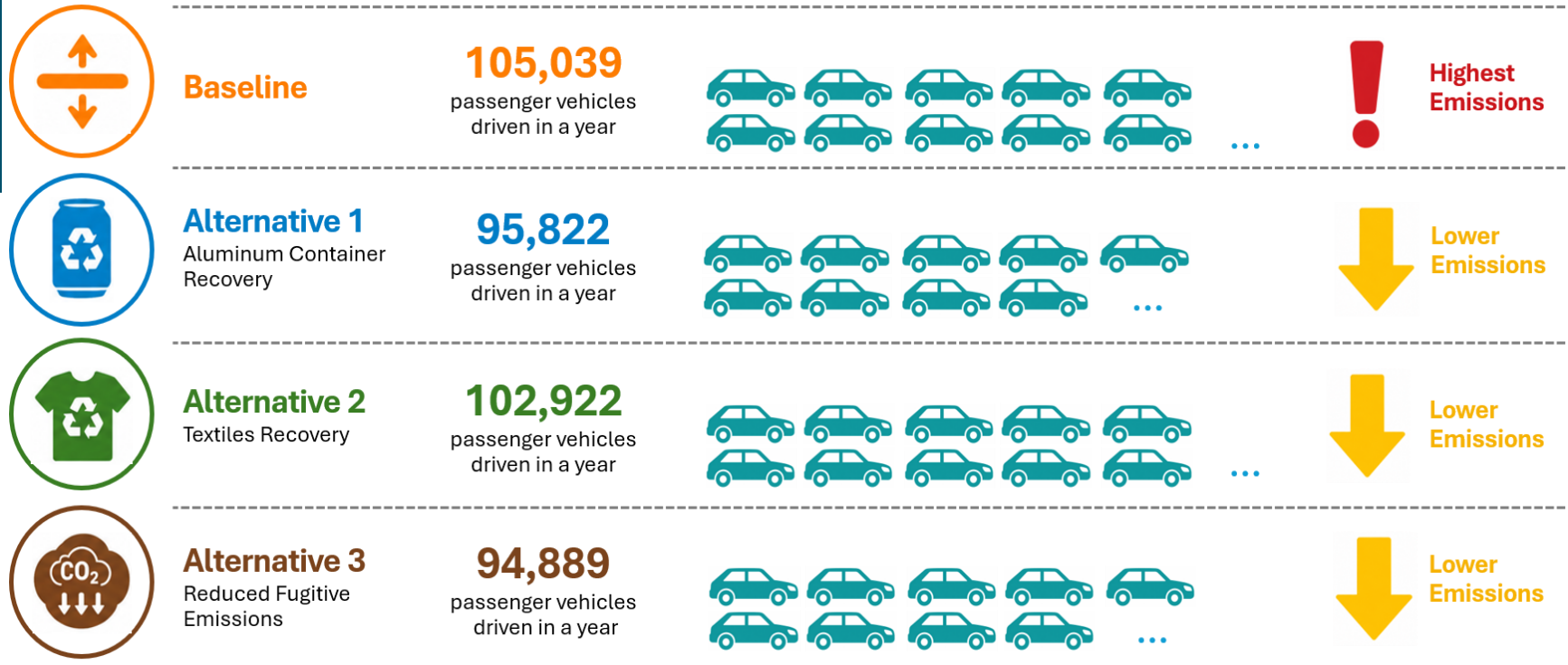
Baseline vs. Alternatives



Alternatives – Relatable Term, Emissions

Aggregated Environmental
Impacts of Four Waste
Materials Management
Pathways

Converting Emissions Into Everyday Terms



These figures show the equivalent number of passenger vehicles driven for one year to produce the same emissions.

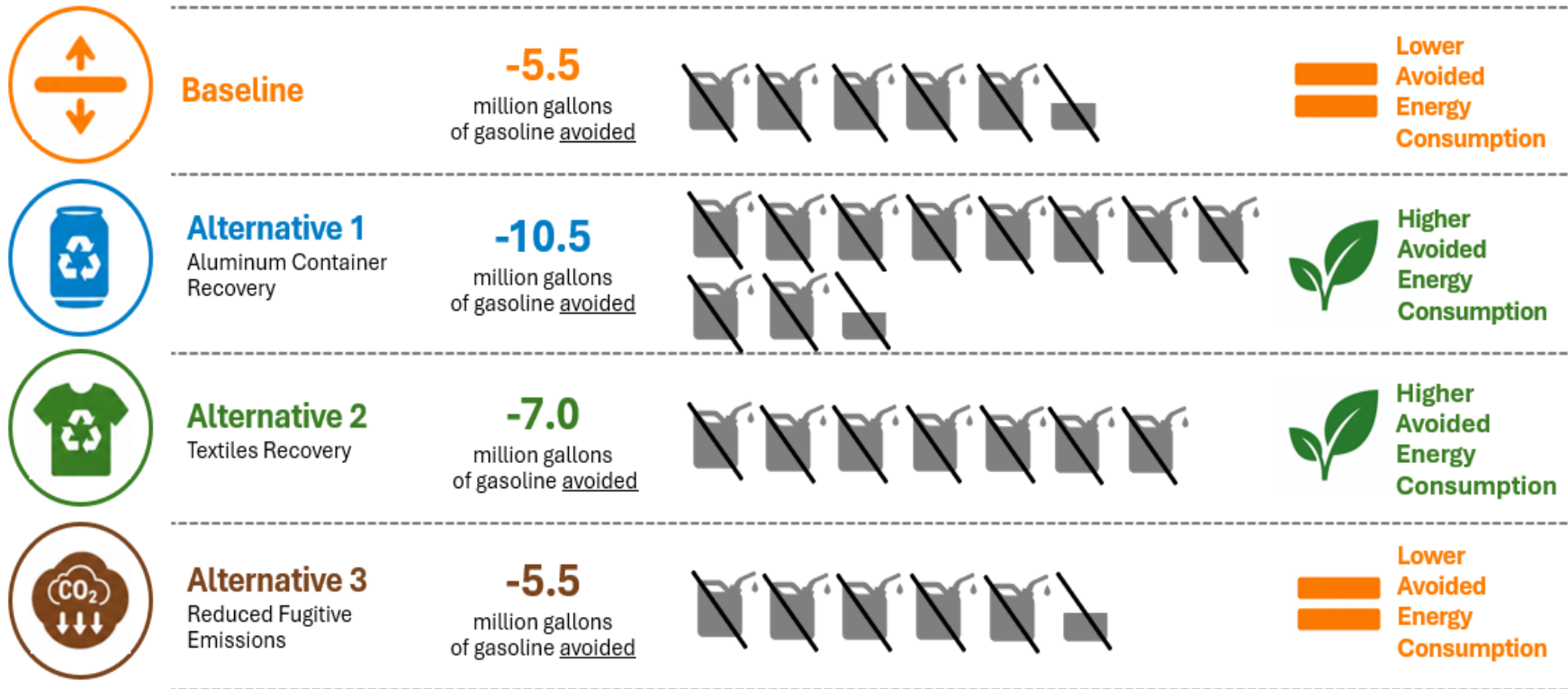
1 passenger vehicle driven for one year = 4.7 metric tons CO₂e.

Results reflect statewide impacts across Iowa.

Alternatives – Relatable Term, Energy

Aggregated Environmental Impacts of Four Waste

Converting Energy Into Everyday Terms



These figures show the equivalent energy content of gasoline needed to produce the same amount of energy.

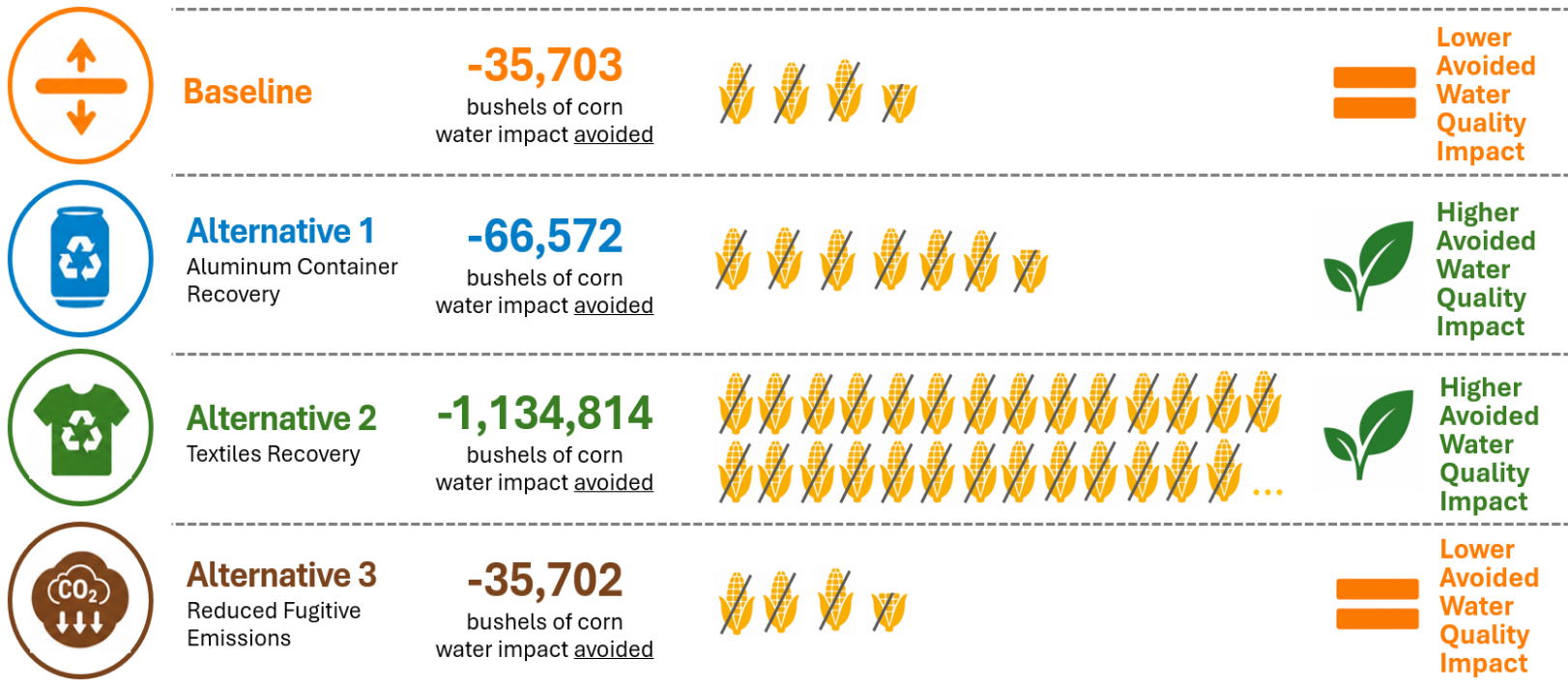
1 gallon of gasoline = 126.8 megajoules.

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Alternatives – Relatable Term, Eutrophication

Aggregated Environmental Impacts of Four Waste Materials Management Pathways

Converting Eutrophication Impact Into Everyday Terms



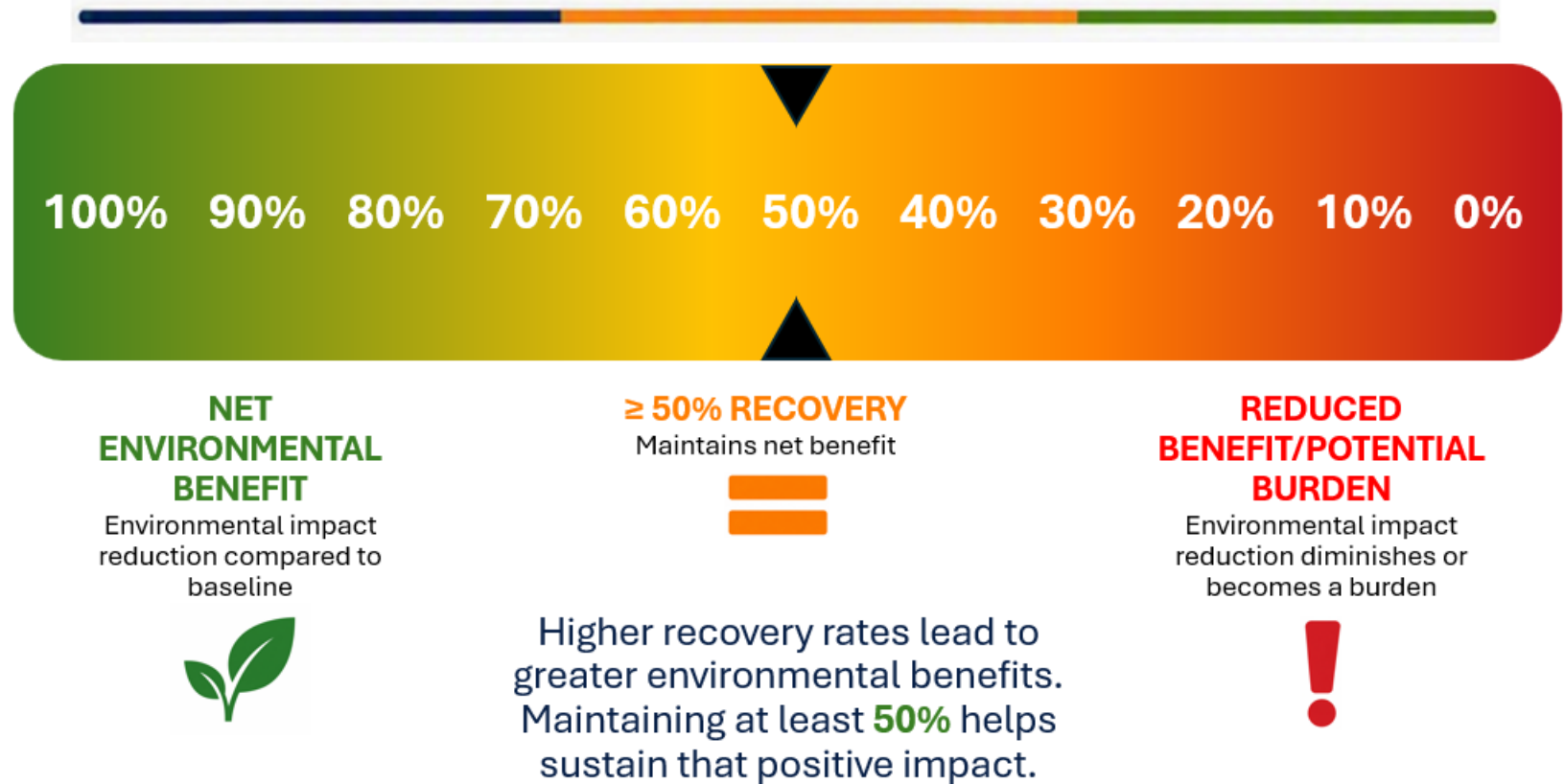
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1 bushel of corn = 0.533 kg nitrogen eq.

Results reflect statewide impacts across Iowa.

Effect of Textiles Processing Loss Rate on Environmental Benefits

HOW RECOVERY RATES AFFECT EMISSIONS





Next Steps