



PLASTIC RECYCLING, INC.

ENGINEERED RECYCLED COMPOUNDS

PRI WHITEPAPER

THE CARBON MATH.

How recycled compounds reduce your Scope 3 footprint — what the numbers actually mean, how they're calculated, and how to put them to work in your sustainability reporting.

WHY IT MATTERS

SCOPE 3 IS WHERE THE HARD TARGETS LIVE

For most manufacturers, the largest share of the carbon footprint isn't in their own operations — it's in their supply chain.

Purchased materials sit squarely in **Scope 3**, the category that is hardest to measure, hardest to reduce, and increasingly the one regulators and investors are asking about.

Virgin plastic resin is a meaningful Scope 3 contributor. It is produced from fossil feedstocks through energy-intensive processes, and every pound a manufacturer buys carries an embedded carbon cost from extraction through polymerization. For a company with public ESG commitments — or one preparing for mandatory climate disclosure — that embedded carbon is no longer invisible.

This is where recycled compounds change the math. **Every pound of recycled compound that replaces a pound of virgin resin avoids the emissions associated with producing that virgin resin.** The reduction is real, it is measurable, and it lands in exactly the category — Scope 3, purchased goods — where most manufacturers need it most.

"The carbon case for recycled content isn't abstract. It's a line item: pounds of virgin displaced, multiplied by the emissions avoided per pound. The challenge has never been the logic — it's having material consistent enough to actually use at scale."

— THE PRI OPERATING PHILOSOPHY

THE CORE PRINCIPLE

DISPLACEMENT, NOT OFFSETTING

It is worth being precise about what recycled content does and does not do, because sustainability teams are rightly skeptical of vague claims.

Recycled compounds do not "offset" emissions in the carbon-credit sense. They **displace** them. When a recycled compound substitutes for virgin resin in a part, the virgin resin that would otherwise have been manufactured simply isn't — and the cradle-to-gate emissions of producing it are avoided. This is a direct, physical reduction in the embedded carbon of the finished product, not a purchased credit applied after the fact.

That distinction matters for reporting. Displacement-based reductions are defensible, traceable, and tied to a real material flow — especially when that flow is documented through **ISCC PLUS mass-balance chain-of-custody**, as PRI's is.

HOW IT'S CALCULATED

THE MATH, STEP BY STEP

The calculation behind recycled-content carbon savings is straightforward. PRI's online Carbon Impact Calculator uses the same logic shown here — transparent, repeatable, and grounded in published emission factors.

- 1

Start with your annual recycled volume

Take the pounds of PRI compound you use per year that replace virgin resin. If a compound only partially replaces virgin (a blend), count only the replacing share.
- 2

Apply the polymer emission factor

Each polymer has a cradle-to-gate emission factor — the carbon avoided per pound of virgin displaced. These come from published recycled-resin life-cycle data.
- 3

Multiply to get annual CO₂e avoided

Annual replacing volume × emission factor = metric tons of CO₂e avoided per year. That figure is your Scope 3 reduction from the switch.
- 4

Translate into real-world equivalencies

Using U.S. EPA equivalency factors, the same number converts into relatable terms — cars off the road, homes powered, trees planted — for stakeholder and board communication.

A WORKED EXAMPLE

WHAT THE NUMBERS LOOK LIKE

Consider a manufacturer running **1,000,000 lbs per month of polypropylene**, switching to a PRI PP compound at a **50% virgin-replacement** level:

PROGRAM INPUTS & RESULT	
Monthly volume	1,000,000 lbs PP
Virgin replacement	50%
Annual volume replacing virgin	6,000,000 lbs
Virgin resin displaced per year	6,000,000 lbs
Estimated annual CO ₂ e avoided	~4,899 metric tons

That estimated annual reduction is equivalent to roughly:

~1,065

CARS OFF THE ROAD / YR

~653

HOMES POWERED / YR

~81,647

TREES PLANTED

6M

LBS VIRGIN DISPLACED / YR

PUTTING IT TO WORK

FROM NUMBER TO REPORTED REDUCTION

A carbon estimate is only useful if it holds up in your reporting. Three things make recycled-content reductions defensible to auditors, investors, and stakeholders:

- **Traceability.** PRI's ISCC PLUS mass-balance certification documents the chain of custody from recycled feedstock to finished compound — so the recycled content behind your reduction is verifiable, not asserted.
- **Consistent, defined material.** Because PRI engineers variability out of its compounds upstream, the material you report on behaves the same lot to lot — so your volumes and replacement levels are stable inputs, not moving targets.
- **Transparent methodology.** The calculation uses published cradle-to-gate emission factors and EPA equivalency data, applied consistently. No black box, no inflated claims.

THE BIGGER PICTURE

WHY THIS IS A SOURCING DECISION, TOO

The carbon math is a sustainability story, but it resolves at the purchasing desk. The same switch that reduces a Scope 3 footprint also gives procurement a domestically produced, certified, consistent material — one that drops into existing processes without performance trade-offs.

That alignment is the point: **the lowest-carbon choice and the lowest-risk sourcing choice can be the same choice.** Recycled compounds engineered to virgin performance let sustainability and procurement pursue their goals together rather than in tension.

38

YEARS OF OPERATIONS

~200M

LBS ANNUAL CAPACITY

ISCC+

MASS BALANCE CERTIFIED

4x

FDA LETTERS OF NO
OBJECTION

Methodology. CO₂e savings are estimated as annual virgin-replacing volume × a polymer-specific cradle-to-gate emission factor, using factors consistent with ISO 14040/14044 life-cycle assessment principles and based on published recycled-resin LCA data (Franklin Associates / APR). Real-world equivalencies use U.S. EPA Greenhouse Gas Equivalencies factors. Actual savings vary by feedstock source, manufacturing process, and transport. Figures are directional estimates for planning and communication purposes and do not constitute a certified product life-cycle assessment.

RUN YOUR OWN NUMBERS

PRI's Carbon Impact Calculator turns your volume, polymer, and replacement level into an estimated annual Scope 3 reduction — and a branded report you can share with your sustainability and procurement teams.

TRY THE CALCULATOR AT [PLASTIC-RECYCLING.NET](https://plastic-recycling.net) →

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