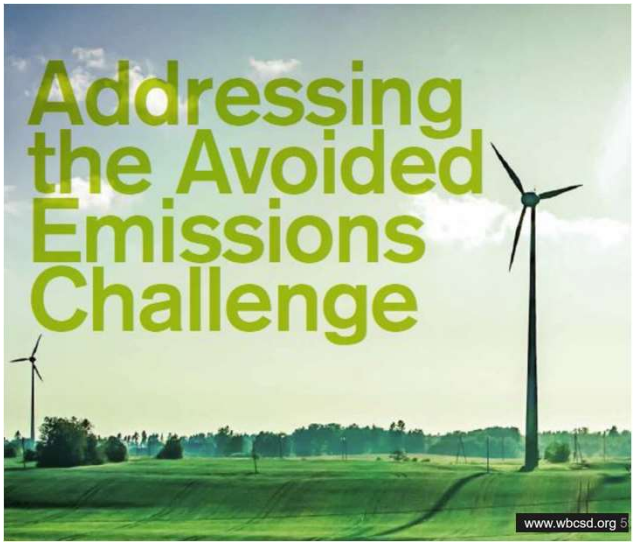
Avoided Emissions (Scope 4) & the WARM Tool

October 2023
Workshop #5



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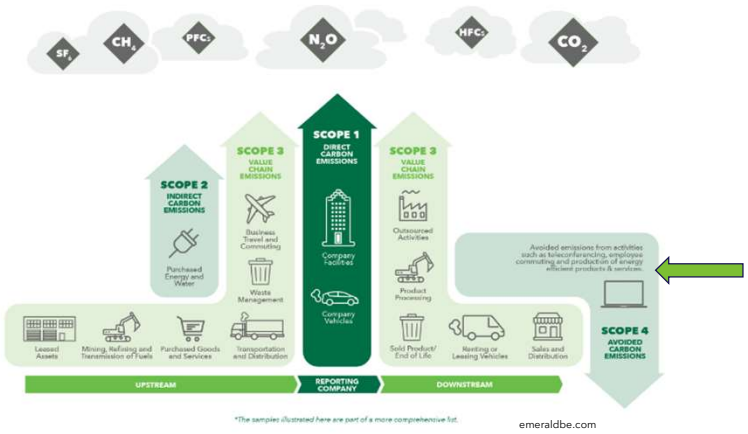
We've reviewed Scopes 1, 2 and 3.

- As we said, Scope 1 is a company's direct operating emission.
- Scope 2 is purchased electricity, and
- Scope 3 is everything else.

Let's shift to our final scope discussion. This is Avoided emissions, sometimes referred to as Scope 4 emissions.

What are Avoided Emissions (Scope 4)



Scope 4 emissions are not included as emissions by a reporting company. They are outside of Scopes 1-3 emissions.

Avoided emissions are emissions that didn't get generated.
The GHG protocol reports emissions, not avoided emissions.

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Avoided Emissions is an area of focus for many ISRI members.

Avoided emissions are exactly what the words say – emissions that didn't get generated.

Globally, the GHG protocol is used to reports emissions. This protocol reports emissions….. Not emissions tha are avoided.

Their goal is to capture all emissions without double counting them.

To avoid double counting of emissions, companies are expected to ONLY report their company's Scope 1 operating emission - such as fuel use, Scope 2 emissions from electricity purchased, and (increasingly) their Scope 3 supply chain emissions.

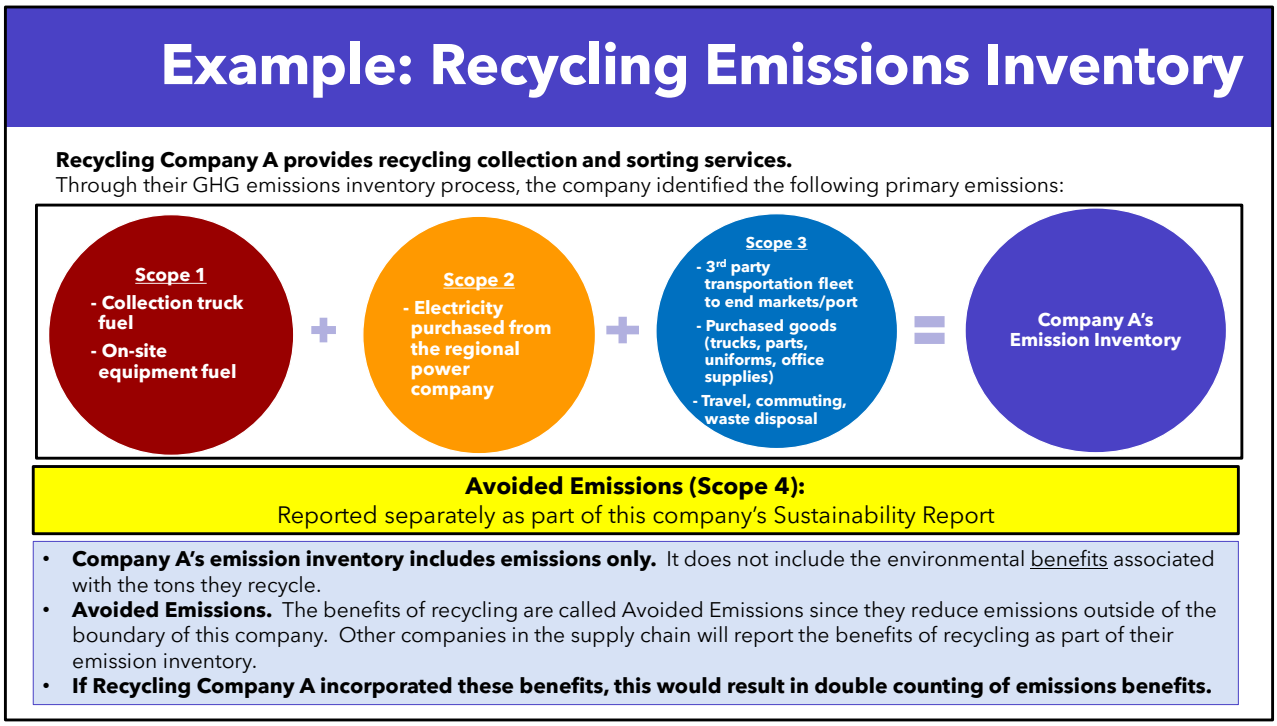
Claims of avoided emissions associated with recycling are reported separately from scopes 1, 2, and scope 3 emissions.

You can see on this slide that Scope 4 emissions are outside of the rest of this company's emissions.

In our industry, recyclers often use EPA's WARM tool to calculate the benefits of the tons they manage for recycling.

- Although they don't get the actual emissions credit for it, their company plays an invaluable role in facilitating the environmental benefits of recycling.
- They may use statements like "our company's recycling saved the equivalent of planting 100 trees each year. It is absolutely fine to do this! Companies do this kind of storytelling to bring attention to the value o the services that they provide.

Again, this is all great information – AND it is also separate from your companies GHG emissions inventory.



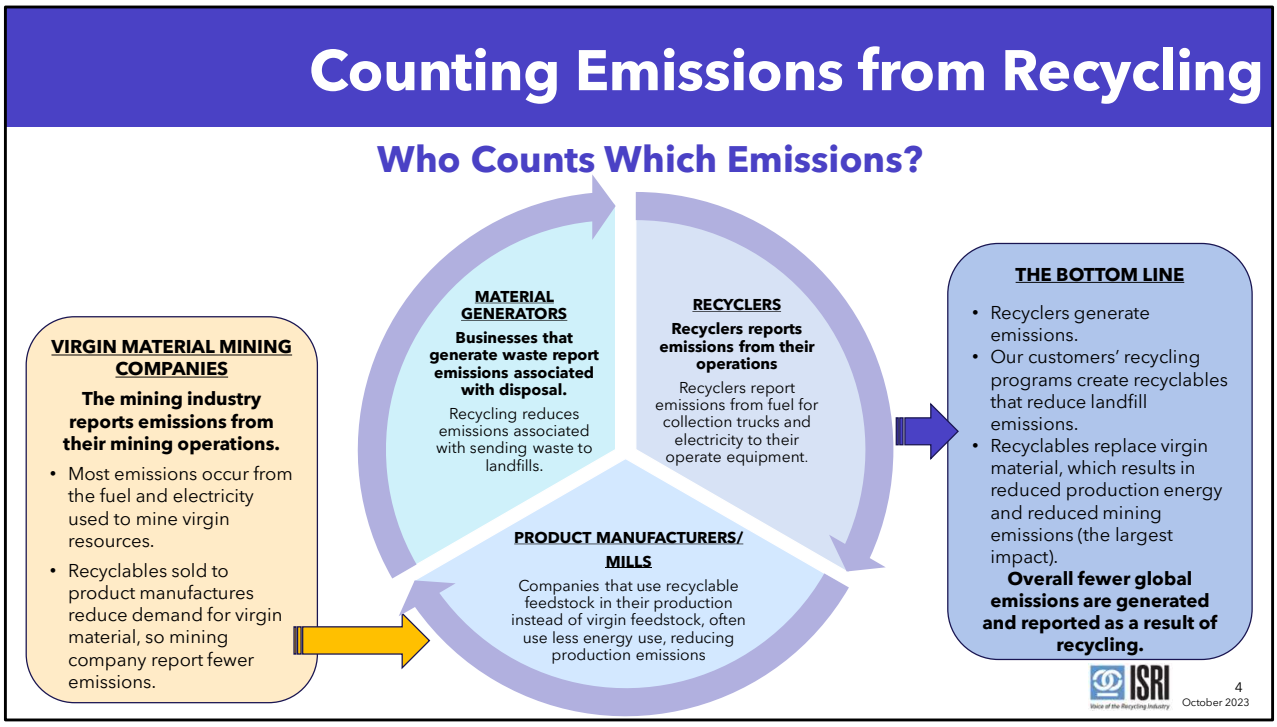
Here is an example of a GHG Inventory.

This is the GHG inventory for a hypothetical recycling company with environmental benefits associated with t avoided emissions from the tons they handle for recycling.

- This recycling company generates Scope 1 emissions from their collection trucks and the energy used in the on-site equipment
- The electricity they use for lights and processing equipment is their Scope 2 emissions
- Their Scope 3 emissions are their office supplies, employee commuting, travel and waste disposal, as well a for their 3rd party vendors used to transport their product to end markets.

The avoided emissions that this company facilitates are counted outside of their GHG inventory.

This is the recycling company's GHG inventory.



Now – let's look at the emission reporting for the other industries that play a role in our supply chain

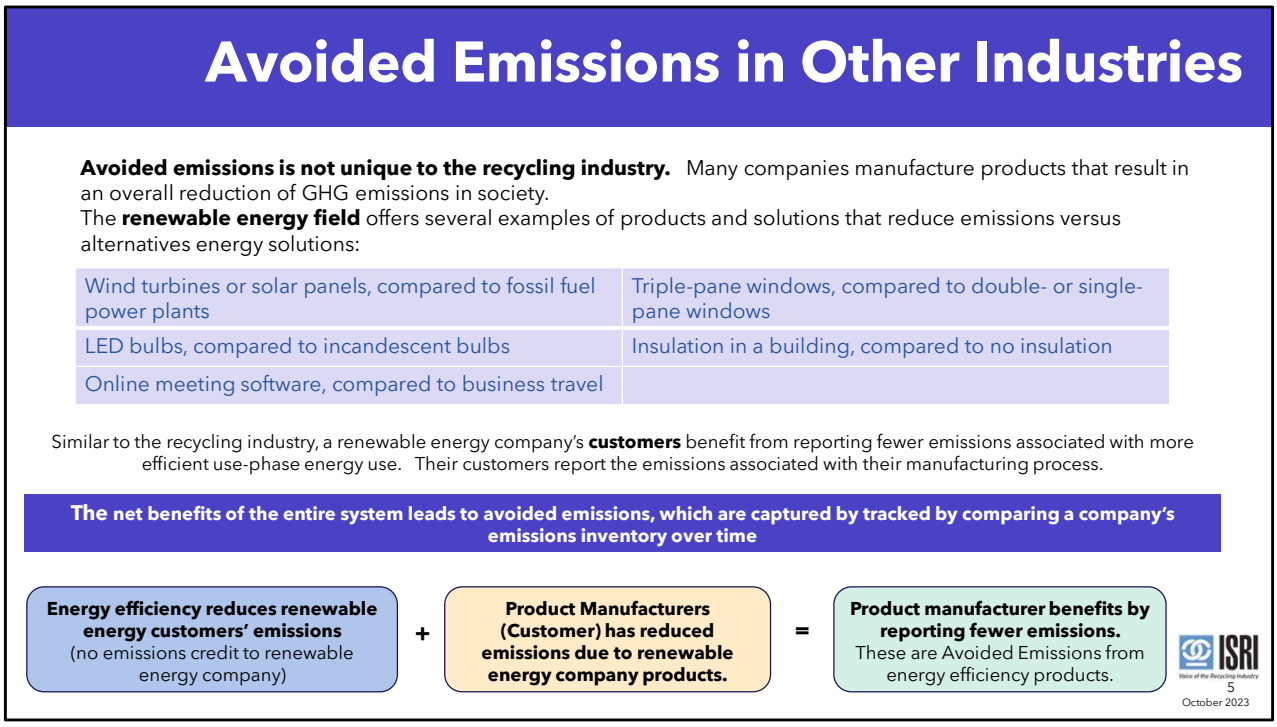
The most significant area of impact is at the source. Mining companies report their emissions which make up the largest portion of a products emissions. Recycling results in less demand for r**aw materials** will have less emissions and will report less scope 1 emissions

- **The manufactures and mills using post consumer content** may use less electricity processing material witl post consumer content, reducing their Scope 2 emissions.
- There will be less waste goes to landfill creating less emissions there – reducing Scope 1 emissions for the landfill, and Scope 3 emissions for the waste generator.

Although Recyclers add emissions to the equation from our trucks picking up material and our equipment usi energy, the recyclables that we collect and process avoid many more emissions than the other players in the value chain create – resulting an overall reduction in emissions from recycling.

Recyclers play a key role in enabling this activity, but we don't get to take credit for those emissions or we would be double counting the benefits that mining companies and manufacturing companies report as par of their scope 1 and 2 emissions.

It is important to tell our story in a way that communicates the benefits to our customers and the environmen from the services we provide.



This is not unique to the recycling industry.

The manufacturers of many products assess the reduction of GHG emissions for other parts of the supply chain. A great example is the renewable energy industry. Their customers benefit from using their renewable energy technologies compared to generating electricity by combusting fossil fuels.

Benefits of knowing the avoided emissions are a sales opportunity for these companies and for many producers and or brand who can highlight the value of their products.

- Energy cost reduction benefits
- GHG reductions
- The Brand value to their customers
- Regulatory compliance
- And Increased sales.

It it really no different for recyclers. We are facilitating emissions reductions through our services.

Risks of Improper Scope 4 Reporting

In an article for Eco-Business, author Ng Wai Mun cautions against inaccurate reporting of Avoided Emissions.

- Avoided emissions claims are often unverifiable or inaccurate.
- Most companies that report Avoided Emissions cherry-pick and publicly report the positive impacts of their products.

  Citing a paper by the World Resources Institute, "*companies tend to only focused on positive impacts in public reporting, ignoring the fact that negative impacts of products are equally common.*"
- Companies risk tarnishing their brand if they are called out for greenwashing or overstating claims on emissions avoided.

Mun offers the following advice for Reporting Avoided Emissions:

1. **Avoid Cherry Picking.** Include negative and positive impacts of products and services.
2. **Be transparent about assumptions.** State assumptions up front.
3. **Consider spillover impact or change in consumer behavior.** The use of a product may create ripple effects that increase or reduce emissions outside of the product's life cycle. Report complete value chain emissions inventory information.

News • Eco-Business explains

Explainer: Avoided emissions and how not to overclaim them

Businesses routinely report their carbon emissions in three categories. There is now growing interest in the potential of a fourth 'scope'. However, experts are wary that companies are using problematic methods to account for these so-called 'avoided emissions'.

https://www.eco-business.com/news/explainer-avoided-emissions-and-how-not-to-overclaim-them/

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This article provided another "aha" moment for me. It highlighted how important it is to use carefully crafted and transparent language when talking about Scope 4, or avoided emissions.

The article points out that many companies cherry pick the positive avoided emissions stories without acknowledging that there may be negative impacts, as well. A credible tracking system would ensure that both are reported, and that all assumptions used are transparent.

The other thing I had not considered, is that there are no standards for reporting Avoided Emissions, thus, it is hard to compare them or know how credible the information is.

Companies expose themselves to accusations of greenwash when they use problematic methods to account for their avoided emissions. Including transparent and complete information is important when talking about Avoided Emissions.

Additional notes:

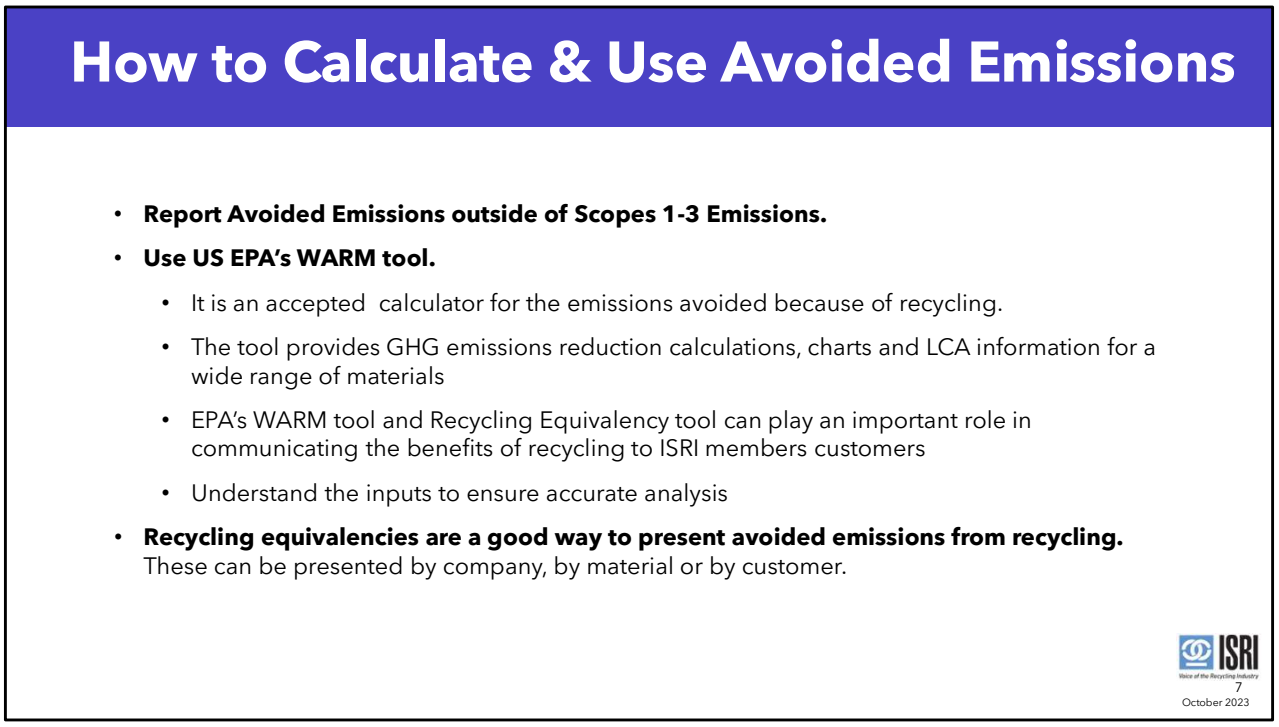
1 Do not cherry pick

Credibly tracking progress of whether a company has done its part in emissions reduction would require the company to consider both the negative and positive impacts of all the products in its portfolio. Some avoided emissions claims aggregate comparisons of multiple products, such as a company's entire line of low-carbon products. Image: World Resources Institute. When choosing products to assess, companies should not limit their analyses to low-carbon products that are known to or expected to reduce emissions. For example, a TV manufacturer might compare the life cycle emissions of its latest model to an older model built with outdated technology. This ultimately makes Scope 4 reporting a meaningless exercise. Ee suggested that companies should select an industrial average value or a value calculated based on the best available techniques, for comparison. "It will not be wise to select the emissions value of product with high emissions as the baseline, just to have a higher avoided emissions value," said Ee. "To ensure transparency, it is good practice to justify the reason for the choice of baseline too."

Assumptions used in the evaluation of Scope 4 are key influencing factors, particularly for products with long life spans or products with multiple purposes. It is important to state these assumptions upfront. For example, in the case of a reusable bag, the number of times it is used in its "lifespan" will eventually determine how much avoided emissions can be claimed by producers of these bags, while comparing them to single-use plastic bags.

3 Consider spillover impact or change in consumer behavior

To provide a more holistic view and inform consumers or stakeholders on the trade-off when using a specific product, it is important for companies to account for the potential spillover impact of a product. The use of a product may create ripple effects that then increase or reduce emissions outside of the product's life cycle. For example, a product that regularly needs maintenance and cleaning might result in higher water usage, hence cancelling out the emission reduction claims the company made while producing it. Before embarking on Scope 4 reporting, companies should ensure they report a complete corporate value chain inventory, including Scope 1, 2 and 3 emissions. "The golden rule is to provide clear and complete information and ensure transparency and accountability,"



We now know more about Avoided Emissions.

Next up: How do we calculate them? And how SHOULD we use or report them?

Fortunately, in our industry, similar to the GHG calculator that we learned about in August, we also have U.S. EPA's Waste Reduction Model (WARM) tool to support consistent calculations of Avoided emissions from recycling.

EPA's WARM tool reports emissions outside of Scopes 1-3 emissions.

It is a widely accepted calculator and has been continually updated and improved over the years.

It's a great tool for our industry to use to communicate the benefits of recycling to our stakeholders.

U.S. EPA's Avoided Emission Calculator

EPA developed its WARM tool over 25 years ago to help businesses calculate emissions.

- It estimates the potential GHG emissions, energy savings and economic impacts of baseline and alternative waste management practices
- WARM is updated regularly--Version 17 was completed in 2023
- GHG savings are calculated by comparing the emissions associated with managing materials under an alternative scenario with the emissions associated with the user's baseline scenario (i.e., current practices)

WARM Calculation Example:
The GHG savings of recycling one (1) short ton (standard U.S. ton) of aluminum cans instead of landfilling them (requiring more virgin production) would be calculated as follows:

(1 short ton × 9.13 MTCO2E/short ton) - (1 short ton × 0.02 MTCO2E/short ton) = -9.15 MTCO2E*

Emissions from manufacturing aluminum | **Emissions from recycling aluminum** | **Emissions avoided by recycling aluminum**

*** Avoided emissions are expressed as a negative, since they are a reduction in emissions**

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This Calculator was originally designed to be a simplified tool to help **small business and low emitter organizations** estimate and inventory their annual greenhouse gas (GHG) emissions.

You can see in the equation at the bottom of the slide that it includes the emissions impact from mining and manufacturing materials – the orange.

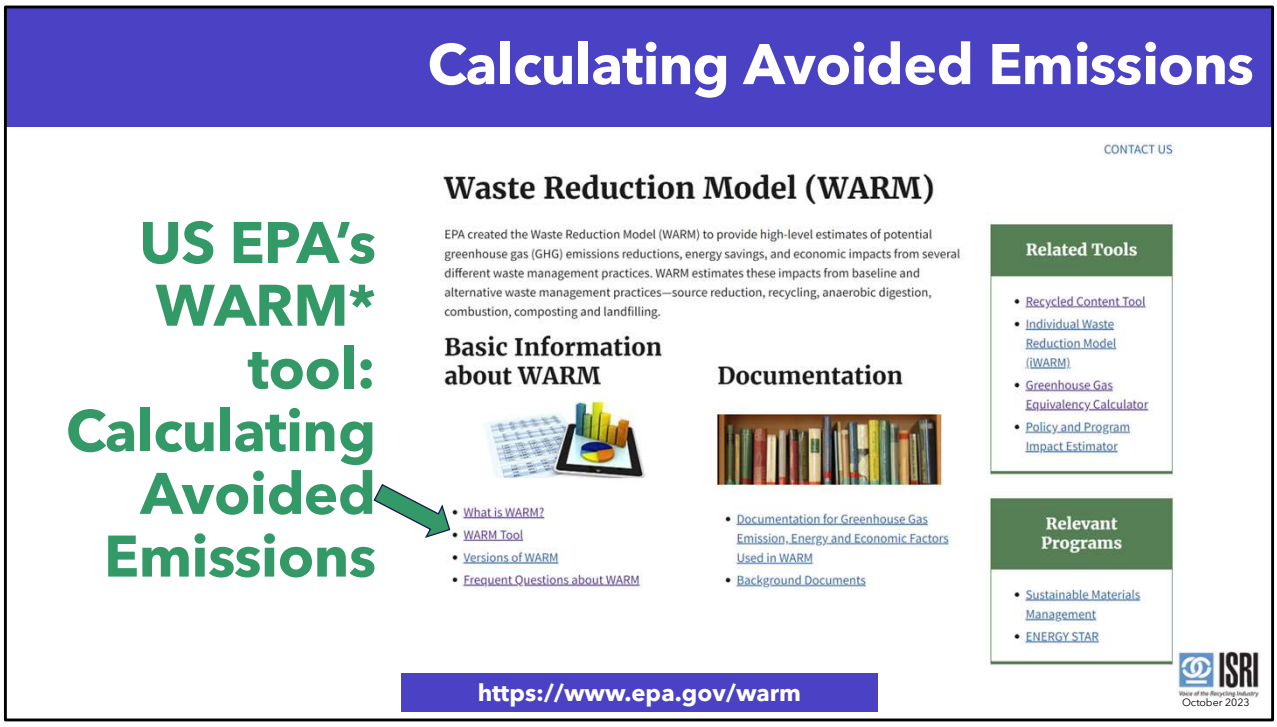
Then, it includes the emission impact from our recycling operations – the blue. This is our Scope 1 emissions associate with fuel used during collection and energy used at our facilities.

The next is an emissions benefit associated with recycling - in the green.

NOTE the green is expressed as a negative number because it is a REDUCTION of emissions. These are emissi that were avoided, or never created, from recycling.

Calculating Avoided Emissions

US EPA's WARM* tool: Calculating Avoided Emissions

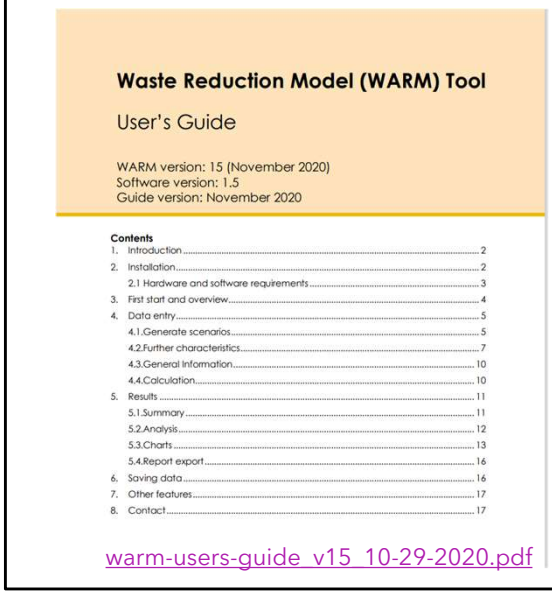


The WARM tool is available in the public domain, is updated frequently, and is not subject to specific sector c company interpretations. And it is free to use.

It was last updated in June of this year. **It has expanded and now includes data on 60 different materials an it very easy to use**. At the most basic level, all you need are tons of waste handled for any particular materials. You can use national averages for energy and transportation distances, or plug in your own numbers for more accurate data.

I'm going to walk through a really simple example of using the calculator.

WARM User's Guide



Waste Reduction Model (WARM) Tool

User's Guide

WARM version: 15 (November 2020)
Software version: 1.5
Guide version: November 2020

Contents

warm-users-guide_v15_10-29-2020.pdf

Documentation for GHG Emission, Energy and Economic Factors Used in WARM

The WARM documentation explains the calculation of emission factors by material type, or group of materials, arranged into individual chapters. EPA also provides chapters addressing each specific materials management practice that is available in WARM, along with a background and overview chapter, a list of definitions and acronyms, user's guides for the different versions of the WARM tool, a summary of recent updates in WARM and additional chapters on special topics like forest carbon sequestration, energy factors and economic impacts.

The WARM documentation chapters are grouped into several files based on the following chapter topics:

- User's Guide WARM Version 15: provides an overview for users who may be new to the tool or need some basic knowledge about downloading and modeling scenarios in WARM version 15
- User's Guide WARM version 15 Excel: provides an overview for users of the Excel-based tool for WARM version 15. This guide is the same as the guide found on the first sheet of the WARM Excel tool
- Background includes chapters covering:
  - WARM Background and Overview
  - Definitions and Acronyms
  - Recent Updates in WARM
  - Forest Carbon Storage
- Management Practices includes chapters covering:
  - Source Reduction
  - Recycling
  - Anaerobic Digestion
  - Composting
  - Combustion
  - Landfilling

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Of course, EPA provides a users guide. The link to it is on the left below the table of contents.

Behind the Scenes Documentation

WARM User's Guide. The guide provides an overview for users who may be new to the tool or need some basic knowledge about downloading and modeling scenarios.

- **Background** - WARM Background and Overview, Definitions and Acronyms, Recent Updates in WARM, Forest Carbon Storage and Transportation Assumptions
- **Management Practices** - Source Reduction, Recycling, Anaerobic Digestion, Composting, Combustion, Landfilling, Energy Impacts and Economic Impacts
- **Containers, Packaging and Non-Durable Goods Materials** - Glass, Metals, Paper Products, Plastics, and Polylactide (PLA) Biopolymer
- **Organic Materials** -Food Waste and Yard Trimmings
- **Electronic**s - Electronics
- **Tires** - Tires
- **Construction Materials** - Asphalt Concrete, Asphalt Shingles, Carpet, Clay Bricks, Concrete, Drywall, Fiberglass Insulation, Fly Ash, Vinyl Flooring, Wood Flooring, and Wood Products.

Links to Background Documentation

- Waste Reduction Model (WARM) Tool User's Guide (pdf) (1.6 MB)
- Waste Reduction Model (WARM) Excel User's Guide Version 15 (pdf) (615.23 KB)
- Background Chapters (pdf) (934.25 KB)
- Management Practices Chapters (pdf) (2.74 MB)
- Construction Materials Chapters (pdf) (2.67 MB)
- Containers, Packaging, and Non-Durable Goods Materials Chapters (pdf) (2.24 MB)
- Electronics Chapter (pdf) (847.95 KB)
- Tires Chapter (pdf) (599.87 KB)
- Organic Materials Chapters (pdf) (1.45 MB)

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EPA also has a lot of information on their website that provides great detail and behind the scenes information about their tool.

Here are links to several documents on their website.

WARM Covers 60 Materials

WARM covers 60 material types →

WARM includes 6 materials management practices:

- Recycling
- Source Reduction
- Combustion
- Composting
- Anaerobic Digestion
- Landfilling

WARM calculates emission, energy and economic factors for each material and management practices, including:

- Units of metric tons of carbon dioxide equivalent (MTCO2E)
- Million BTU
- Labor hours
- Wage dollars
- Tax dollars

Materials Types Recognized by WARM

Aluminum can	Aluminum Ingot	Asphalt Concrete	Asphalt Shingles	Beef	Branches
Bread	Carpet	Clay Bricks	Concrete	Copper Wire	Corrugated Cardboard
Cathode Ray Tube (CRT) Displays	Dairy Products	Desktop Central Processing Units (CPUs)	Dimensional Lumber	Drywall	Electronic Peripherals
Fiberglass Insulation	Flat-Panel Displays	Fly Ash	Food Waste	Food Waste (mean only)	Food Waste (non-meat)
Fruits and Vegetables	Glass	Grains	Grass	Hard-copy Devices	HDPE (high-density polyethylene)
LDPE (low-density polyethylene)	Leaves	LLDPE (linear low-density polyethylene)	Magazines/ Third-Class Mail	Medium Density Fiberboard	Mixed Electronics
Mixed Metals	Mixed MSW (municipal solid waste)	Mixed Organics	Mixed Paper (general)	Mixed Paper (primarily from offices)	Mixed Paper (primarily residential)
Mixed Plastics	Mixed Recyclables	Newspaper	Office Paper	PET (polyethylene terephthalate)	Phonebooks
PLA (polylactic acid)	Portable Electronic Devices	Poultry	PP (Polypropylene)	PS (polystyrene)	PVC (polyvinyl chloride)
Steel cans	Textbooks	Tires	Vinyl Flooring	Wood Flooring	Yard Trimmings

Here is the list of the latest material types that EPA has included in the WARM calculation. There are 60 of them!

This means that they have done the research to understand the emissions impact of mining the raw materials and manufacturing each of these products.

Having this work completed allows us to simply enter local information such as miles and tons recycled to determine the impact of recycling versus reduction or disposal.

The tool include end-of-life management practices in addition to recycling – such as source reduction, composting, anaerobic digestion, combustion, and landfilling. This allows you to run the program to compare different management practices.

For example, you can use the tool to calculate the emissions differences between recycling and source reduction. Or composing versus anaerobic digestion.

They've also continued to expand the tool to generate information in addition to emissions, such as energy and various economic factors.

Today we will stick to the basics: the emission associated with recycling versus disposal.

Getting Started: Accessing WARM

The download requires time (and patience).

1. Identifying which version to download

Current WARM Tool - Version 15

WARM version 15 was originally released in May 2019 and was updated in November 2020 and September 2022. WARM is now available as a tool based on a database developed in openLCA software, with versions available for both Windows and Macintosh users (zip). The openLCA database for WARM Version 15 (zip) is also available. Users are still able to access the Excel-Based Tool (xls) (3.43 MB).

2. Installation

There are versions of the WARM Tool available for Windows (64 bit and 32 bit upon request) and Mac (64 bit and 32 bit upon request). In all cases, the tool is provided in a compressed file (*.zip, *.gz), which should be first downloaded and then its content extracted (i.e., right click on the file → Extract...).

A folder "WARM" will be then generated. The file "WARM.exe" contained in it should be run to get the application started.

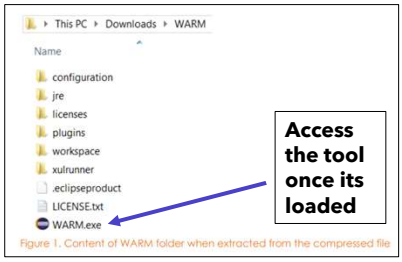

Figure 1. Content of WARM folder when extracted from the compressed file

2.1 Hardware and software requirements

Hardware:

- 1 GB RAM
- 140 MB (Windows), 64 MB (Mac) free hard disk space

Software:

- For MacOS users, Java version 8 is required to run the WARM tool. The official Oracle release of Java 8 may require a separate license agreement with Oracle. More details can be found here. The WARM tool may also be compatible with OpenJDK versions of Java 8. MacOS users may install OpenJDK free of charge by using the SDK command line tool. More information on SDK can be found here.
- Microsoft Visual C++ Runtime v10 needs to be installed on Windows 64 bit because the WARM Tool contains a browser engine for the display of modern HTML pages that requires this runtime. If you have not installed it before running the tool, a message like in Figure 2 would be shown. You can download this runtime here.

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We'll start with the basics of the tool.

You must first download the tool to use it. This requires some patience! It takes some time. Not an hour, but certainly 5-10 minutes.

Once its downloaded, click on the WARM icon.

Calculator Overview

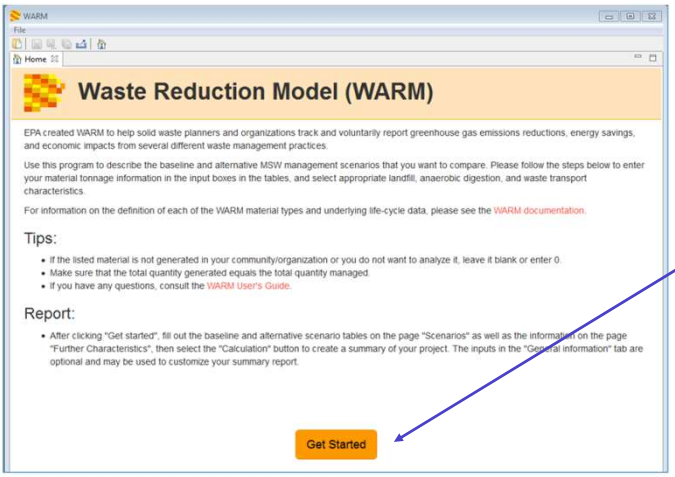

Figure 3. Home tab

If you click the button "Get Started", a new tab "Data Entry" appears, where the data for the analysis should be entered by the user. This tab consists of four steps: Scenarios, Further Characteristics, General Information and Calculation. You can navigate through them by clicking on the buttons on the top of the tab or on the "Back"/ "Next" buttons on the bottom of the page. You can also use the scrollbar in the right of the window to see the full content of each page. Detailed information about the "Data Entry" tab is provided in section 4 of this guide.

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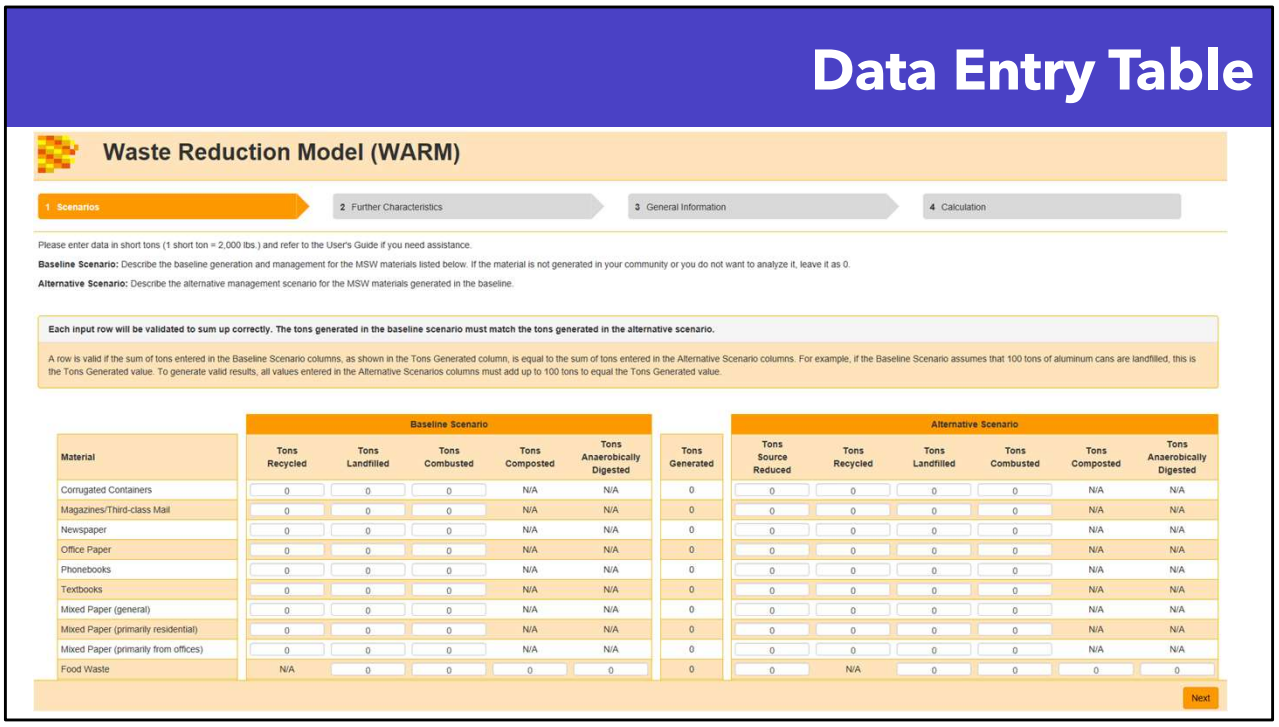
EPA has made the calculator very easy to you.

Data Entry Table



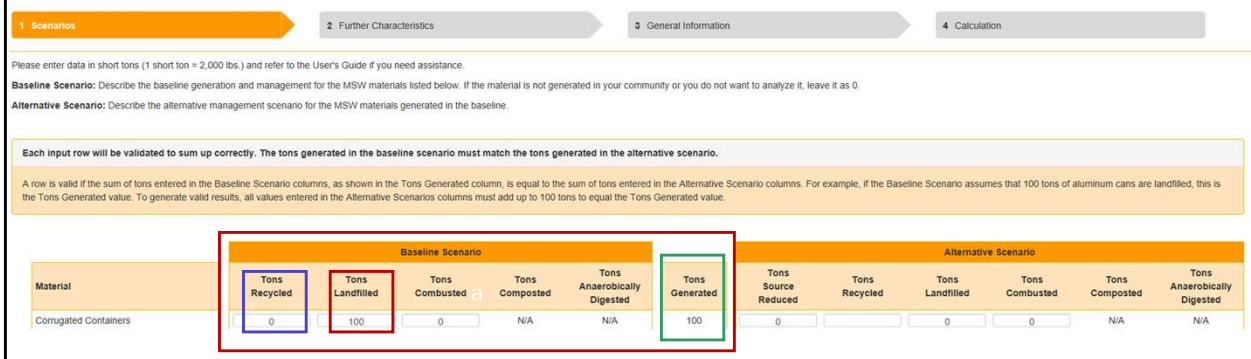
This is the basic data entry page for the tool.

Each of the 60 covered materials are listed on this tab. You simply add the number of ton that you are dealing with for each material.

Important. If you want to know what the avoided emissions are of a material being recycled versus landfills – you start with tons landfilled in the Baseline on the left . Then you enter the tons recycled in the Alternative section on the right.

Here is an example (next page)

Example: Cardboard Recycling



WARM requires entering the "Base Scenario" tons recycled and/or landfill first

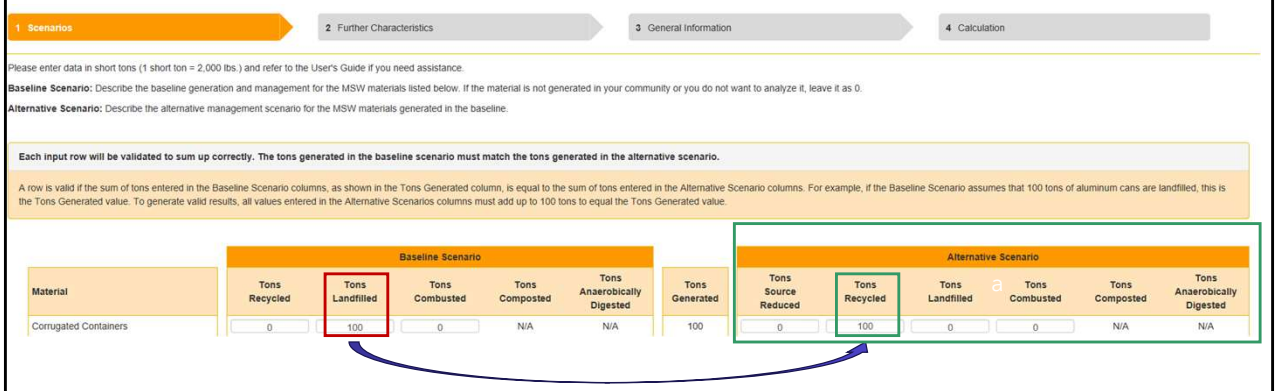
20XX 16

Cardboard was used here as an example since it is the first material listed and we can easily see the categories for each column of information requested.

To calculate the impact of recycling, start with the number of tons being landfilled. The blue box outline on the left it the baseline.

After the first time, you'll be surprised at how easy it is to play with.

Adding Recycling



Next, enter tons recycled in the Alternative Scenario Section.
The total tons managed must be reconciled.

Next, input the tons on the right side of the spreadsheet in the **Alternative Scenario**

Error Alert

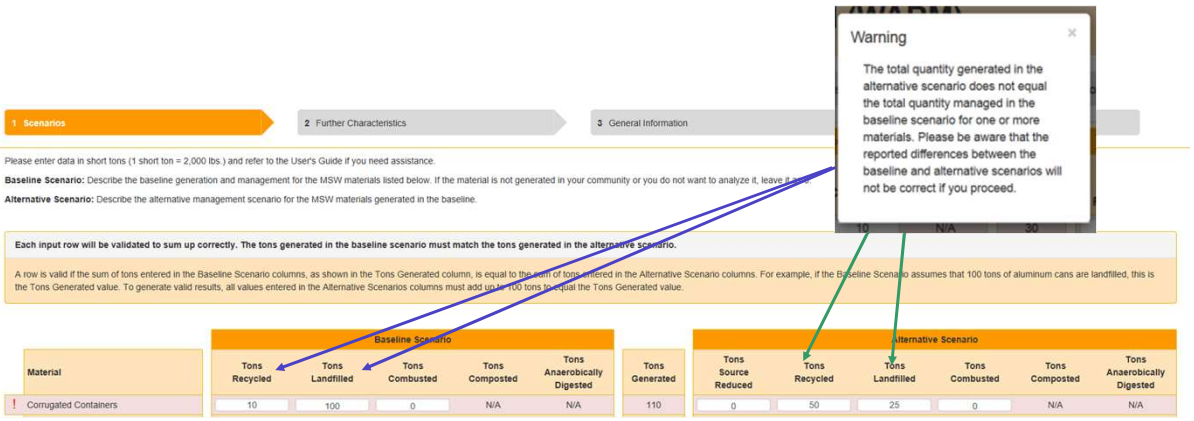


Figure 6. Error of validation for several materials in the "Scenarios" step (i.e., baseline total amount ≠ alternative total amount)

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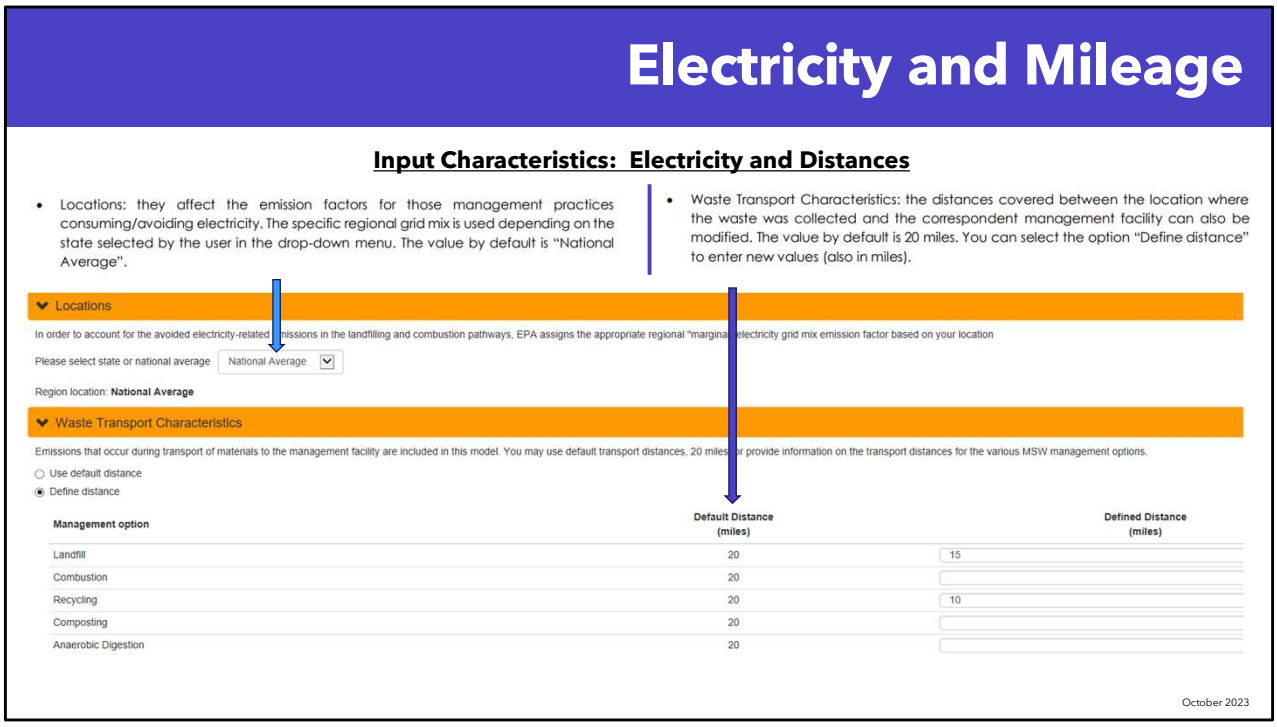
EPA built I checks and balance: If you don't balance the total tons it will give you an error.

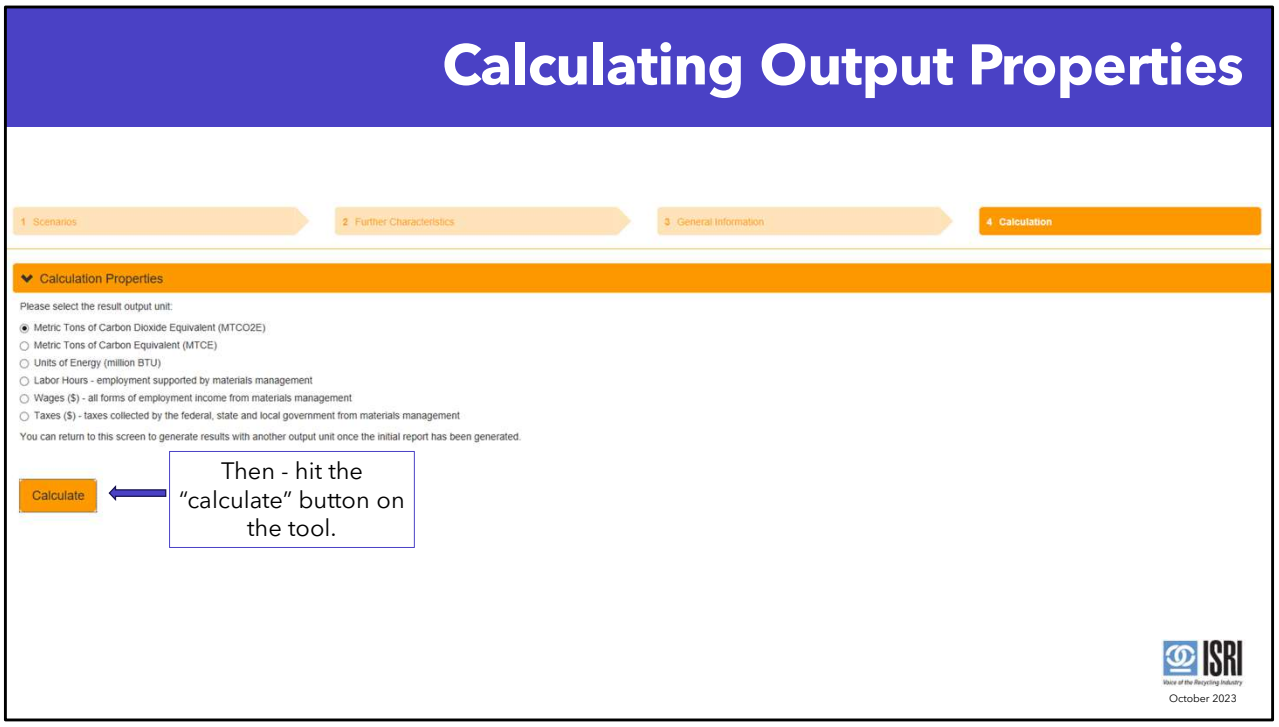


The tool also considers the emissions associated with electricity use and miles traveled

It gives you the option of use the national average for energy and distances to landfills and recycling markets.

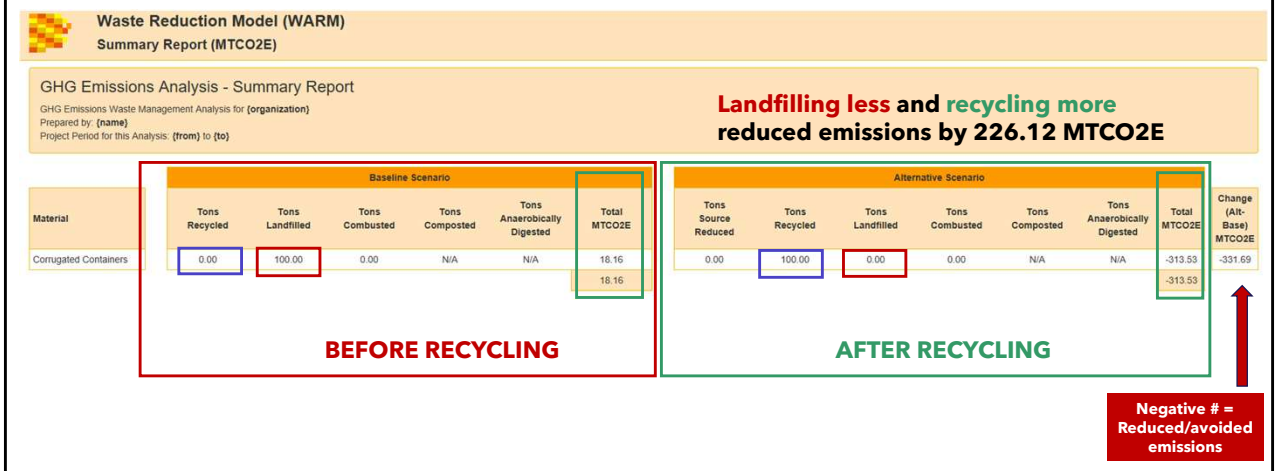
Or, if you have the information, you can also enter actual information that you have for these characteristics.

Calculating Output Properties



Then hit the "Next" button, then the "Calculate" button

Output: Avoided Emissions



Waste Reduction Model (WARM)
Summary Report (MTCO2E)

GHG Emissions Analysis - Summary Report

GHG Emissions Waste Management Analysis for {organization}
Prepared by: {name}
Project Period for this Analysis: {from} to {to}

Landfilling less and recycling more reduced emissions by 226.12 MTCO2E

Material	Baseline Scenario						Alternative Scenario							Change (Alt-Base) MTCO2E
	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Tons Anaerobically Digested	Total MTCO2E	Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Tons Anaerobically Digested	Total MTCO2E	
Corrugated Containers	0.00	100.00	0.00	N/A	N/A	18.16	0.00	100.00	0.00	0.00	N/A	N/A	-313.53	-331.69
						18.16							-313.53	

BEFORE RECYCLING

AFTER RECYCLING

Negative # = Reduced/avoided emissions

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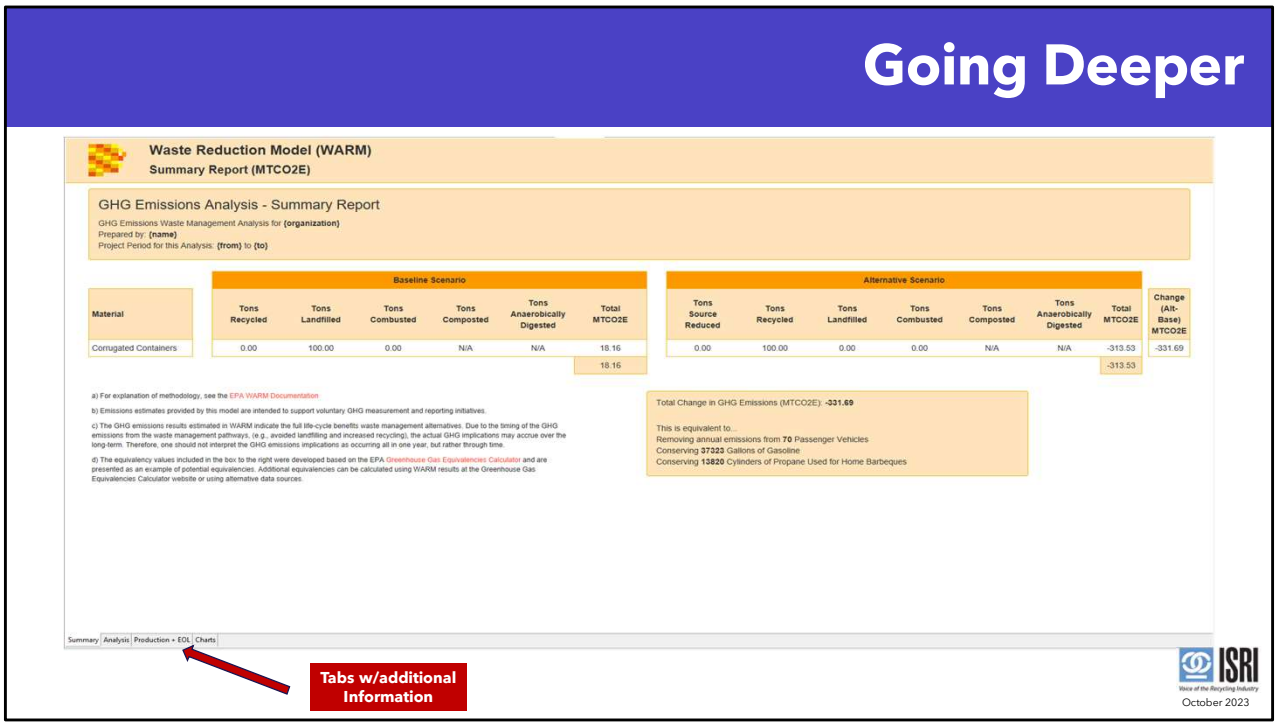
You did it. The tool provides the emissions avoided by recycling versus landfilling (or whatever your baseline is from the alternative…. Combustion to recycling, or composting etc.)

Going Deeper



At the bottom of this sheet, the tool also includes several tabs for additional information:

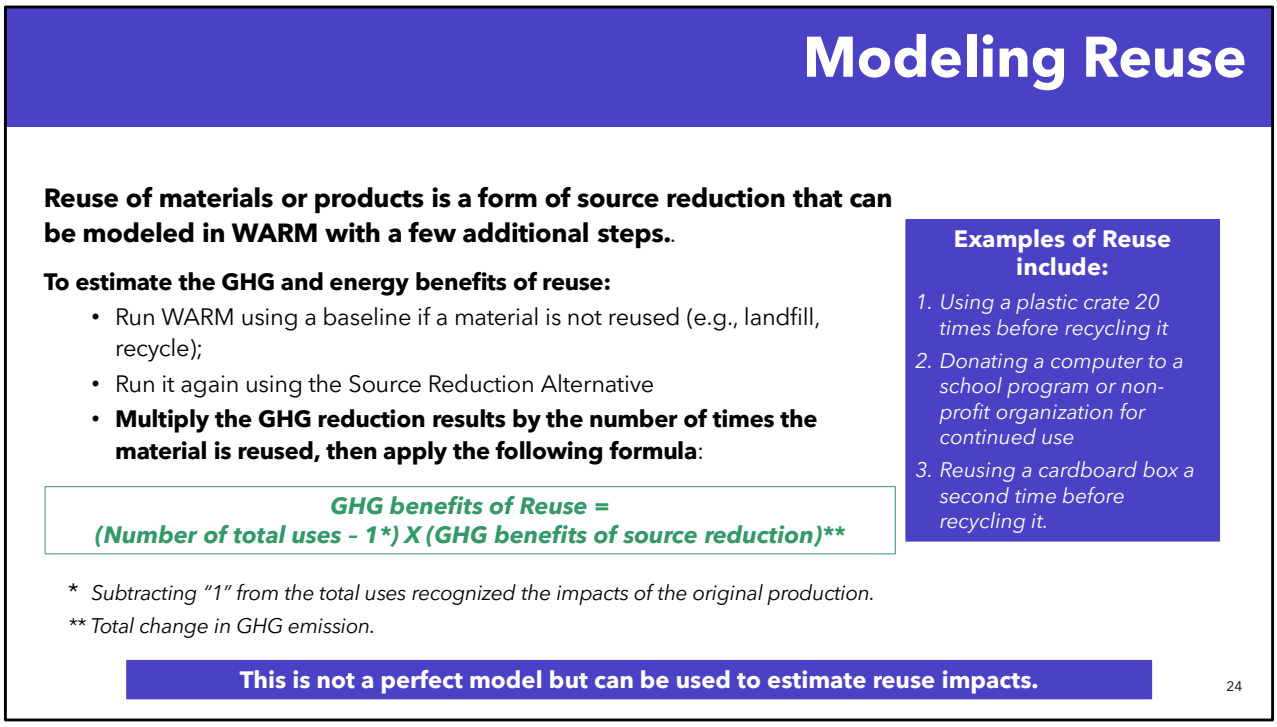
Analysis
Production information, and
Charts

Charts

Here is an example of chart that shows the emissions associated with various management practices for different materials:

Gray is the emission associated with production of each material
Red – is recycling. Note that it is a negative number – below zero for each of these materials.

Since we just ran the tool for recycling, it doesn't show anything for composting or anaerobic digestion, but each can be displayed graphically with this tool.



Next – Re-use….

This is a bit more complicated since you have to run the tool for "source reduction", then take an extra step to get your information.

1. Run WARM using a baseline if a material is not reused (e.g., landfill, recycle);
2. Run it again using the Source Reduction Alternative
3. **Multiply the GHG reduction results by the number of times the material is reused, then apply the following formula**:
4. Input the total tons used minus one, which accounts for the emissions of manufacturing it. Then, multiply that number by the emission benefits that the calculator produces for reducing that item one time. This gives you a number that reflect the benefits of each time its' been reused, while also considering the impact of manufacturing it in the first place.

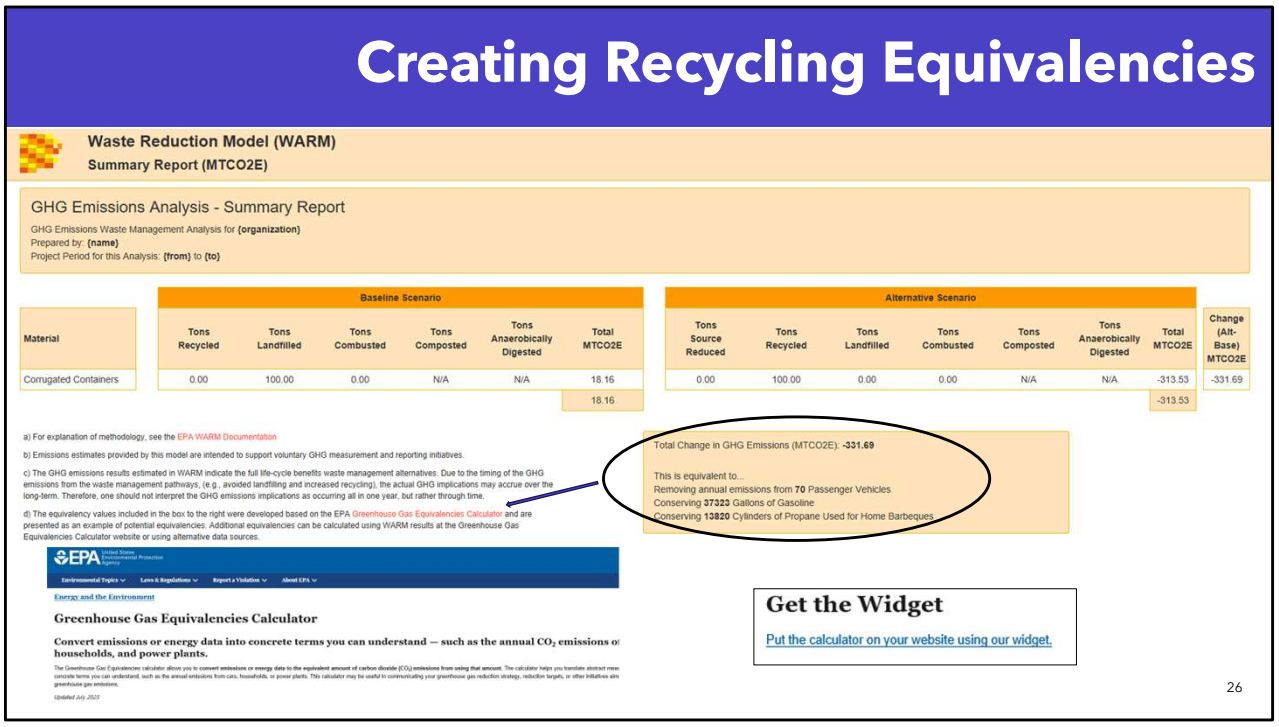
EPA points out that this is not a perfect calculation; however, it gives you a general idea of the benefits of reuse.

Reuse Example: Electronics

Here is an example of reusing 10 tons of electronics 3 times.

GHG benefits of Reuse of 10 tons of electronics reused 3 times: [# of times reused - 1] X 208.6 MTCO2e (one time benefit) = 417.8 MTCO2e

Creating Recycling Equivalencies



Finally, EPA's tool calculates recycling equivalencies, which is using examples of other activities and their equivalent emissions compared to recycling.

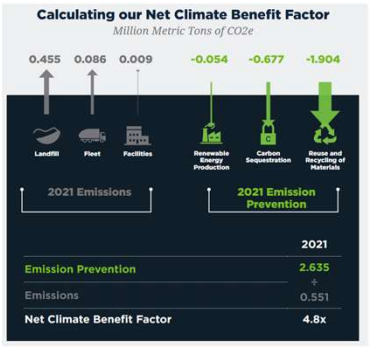
We've talked about this as a great way to communicate the benefits of avoided emissions to your customers. Sticking with our original cardboard example, you can see some of the equivalencies used here: Removing passenger vehicles, conserving gallons of gasoline and conserving cylinders of propose used for home BBQs.

They also have a widget that you can provide to your customers or put on your website to do this quickly and easily.

Using Avoided Emissions & Equivalencies

Company-wide Avoided Emissions equivalencies

Casella Waste Systems Sustainability Report



Material Specific Avoided Emissions and Equivalencies

Radius Recycling
(formerly Schnitzer Steel) 2022 Recycling Report

Recycled more than 5 million metric tons of metals, avoiding approximately 5.5 million metric tons of CO_2e emissions[1]

WM

14,124,673 tons were recycled/composted in 2015

Recycling and composting these materials reduced greenhouse gas (GHG) emissions by more than 33.77 MTCO2e.

The GHG reduction is equivalent to removing more than 7.11 million passenger cars from the road each year!

Customer Specific Equivalencies

Example:
Use EPA's WARM tool to provide your customers with specific information on the emissions their company avoids through the tons they recycle.

ISRI
Voice of the Recycling Industry
October 2023

Here are some examples from ISRI members as well as the suggestion for using EPA's WARM tool to provide customers with specific information about their company's avoided emissions from recycling.

Customer – Focused Tools

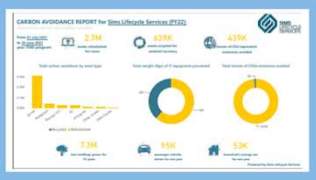
AN INDUSTRY FIRST – SLS CALCULATES THE IMPACT OF REUSE

Many of our clients have publicly announced their own sustainability goals and carbon reduction programs. Organisations are looking for detailed insights into the carbon impact of their overall operations and technology asset handling. In response, Sims Lifecycle Services launched a sustainability calculator this past fiscal year to provide industry-leading environmental impact reporting to their clients.

The calculator quantifies carbon avoidance from recycling, as well as from the reuse of whole IT assets and components – an important differentiation from most calculators currently available. Incorporating reuse data provides a more accurate and complete overview of carbon savings. Detailed dashboards show volumes of equipment processed, disposition routes and the carbon-equivalent emissions avoided, powered by equipment manufacturing data and our own lab-based asset data.

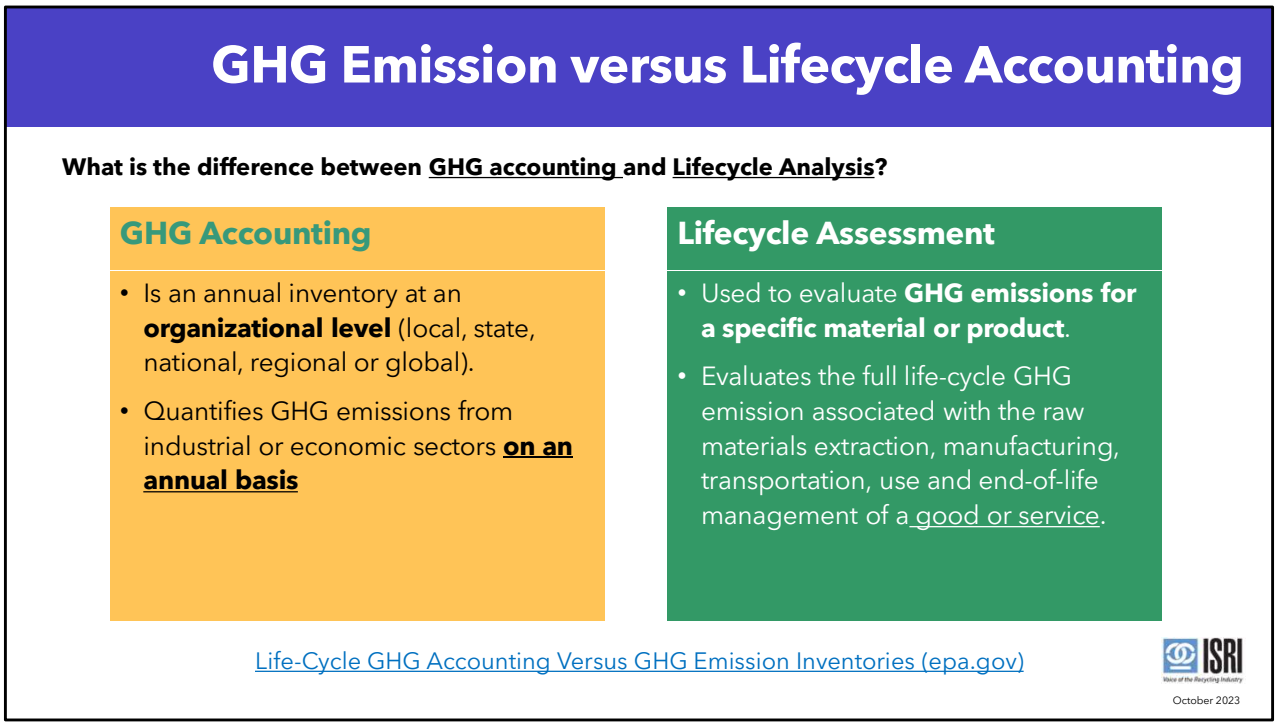
Using the calculator, we are also able to calculate the total emissions avoided by our customers repurposing and recycling IT assets. For FY22, the total avoided emissions impact was 439 kilotonnes of CO_2e – that's equivalent to taking more than 90,000 cars off the road for one year, or enough electricity to charge a smartphone 53 billion times![1,2]

The sustainability calculator has been well received by clients who value the increased transparency SLS can offer. We were delighted when the calculator was recognised by the Reverse Logistics Association with the 2022 Green Reverse Logistics Award.



Sims Metals took this to a new level by developing a calculator that enables customers to calculate their own avoided emissions from recycling and reuse.

In fact, SIMS metals does this and even took it to a new level by developing a calculator that lets customers track their own avoided emissions from recycling and reuse.



Finally – We've heard some questions about the difference between GHG accounting, and Lifecycle Analys and wanted to end with a simple explanation of the difference between them.

Calculators can be used for either, but it is important to understand the different inputs.

The difference between GHG Accounting and LCA

- **GHG accounting** helps organizations (companies, cities, states, countries, etc) understanding their entire ANNUAL emissions impact = Scopes 1, 2 and 3. It quantifies this on an annual basis.
- **A Lifecycle Assessment (LCA)** calculates emissions for a specific material or product only. It requires information about that material to understand the full life-cycle impact associated with raw material extraction, manufacturing, transportation, use and end of life management of a good or service.

This information and guide is available to review if you'd like - as is the EPA's website.