

Knorr-Bremse x carbmee

Supplier Training - Scope 3.1

Collaboration

Q1 2025

Agenda

- **Introduction to the collaboration**

- Knorr-Bremse's objectives
- Introduction to carbmee
- About the collaboration
- Becoming market ready as a supplier

- **Importance of collecting primary data**

- GHG Scopes of emissions
- Objective of Primary Data Collection
- Overview of Data Requirements

- **Data collection**

- Your journey as a supplier
- Overview and an example item
- Important steps using the carbmee solution

- **Support, FAQ's and time for live Q&A's**



Introduction to the collaboration

Knorr-Bremse

Decarbonization Objectives

“Our ‘BOOST 2026’ strategy stands for profitable company growth. Knorr-Bremse’s determined focus on sustainability will be a key factor of success in this. With technological excellence, our product range, our processes, and our committed employees, we are a reliable paver of the way for ESG and our customers’ sustainable mobility. As such, we are also supporting our innovation and long-term business success.”

—Marc Llistosella, Chief Executive Officer, Knorr-Bremse



25%

reduction in scope 3 by 2030



75%

reduction in Scopes 1 and 2 by 2030



Increase

renewable energy



Net-zero

operations by 2050

Who is carbmee?

carbmee is an enterprise software company, specialising in supply chain carbon management.

carbmee's **Environmental Intelligence System (EIS™)** is a carbon management platform for automated and holistic calculation of CO₂ footprints on product, company, and supply chain level.

Our platform is purpose-built for companies with complex supply chains to collaborate with their suppliers and unlock CO₂ reduction potential.



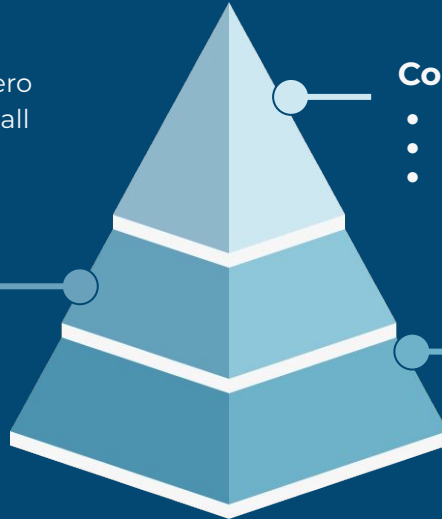
Industrial Expertise for Carbon Management

carbmee EIS™

The end-to-end solution for realizing your net-zero strategy. A holistic carbon footprint software for all emission & footprint calculations

Product Carbon Footprint (PCF)

- Eco-Friendly Product Design
- Automated PCF Calculation
- LCA-Modelling Services
- Connect LCA with Carbon Accounting and supply chain emission reduction



Corporate Carbon Footprint (CCF)

- Corporate Emissions on a transactional level
- Emission calculation for your CSRD Report
- Operationalize your decarbonization strategy to uncover emissions hotspots and reduction potential

Supplier Carbon Footprints (SCF)

- Scope 3 emission calculation
- Supplier Reduction Recommendations
- Supplier Engagement Service
- Carbon Border Adjustment Mechanism (CBAM)
- Report Generation
- Service Support

Module:

Carbon Accounting

carbmee EIS™ guarantees highly accurate, scalable carbon accounting for your CSRD or SBTi Reporting

Module:

Product Carbon Footprint

Calculate the emissions of your products in compliance with GRI Standard, GHG Protocol and ISO 14067

Module:

Supply Chain Emissions

Identify and prioritize your most relevant emissions hotspots with automated calculations

Module:

CBAM

Identify CBAM relevant suppliers, generate and upload the report to authorities



Meet your **team**



END-TO-END GUIDANCE

Benefit from in-platform guidance, webinars, and information-rich resources. We're here to support you at every step of your journey.



IN-HOUSE EXPERTISE

Tap into our diverse in-house expertise, spanning sustainability, carbon accounting, and supply chains.



ON-DEMAND SUPPORT

Tailored support, regardless of supplier maturity.

Meet your team



Leona Mrackova

Supplier Engagement Project Lead your primary point of contact and responsible for delivery of engagement and general sustainability guidance.



Uddhav Chitre

Technical Supplier Engagement Manager your key contact for technical guidance.

Key aspects for you as a supplier

Data availability

- For this collaboration to be successful your data availability is an important part. If your data is not available, gathering calculated values for example for your electricity consumption is still recommended.

Communication

- During this project both Knorr-Bremse and carbmee will be in **regular communication** with you
- Few examples might be, invitation to a **training webinar**, distribution of **training materials**, timeline updates and additional **meetings** if needed
- We will need **timely responses** from your team to ensure **effective communication and to keep the timeline**

Data upload

- Within this training you will learn how to **provide data** to carbmee in the correct manner.
- You will be kindly asked to check pre-calculated emissions in the carbmee platform and upload your data as part of this collaboration.

Becoming **market ready**

COMPLIMENTARY PRODUCT CARBON FOOTPRINT

Build your free Product Carbon Footprint (PCF) of the items you produce

GAIN A COMPETITIVE ADVANTAGE

Gain a competitive advantage by setting yourself apart as an environmentally conscious supplier.

GET AHEAD OF REGULATIONS

Creating transparency on your product emissions will help you stay ahead of emerging regulations and policies.

“The decarbonizing of the global economy is going to create the greatest investment opportunity of our lifetime”

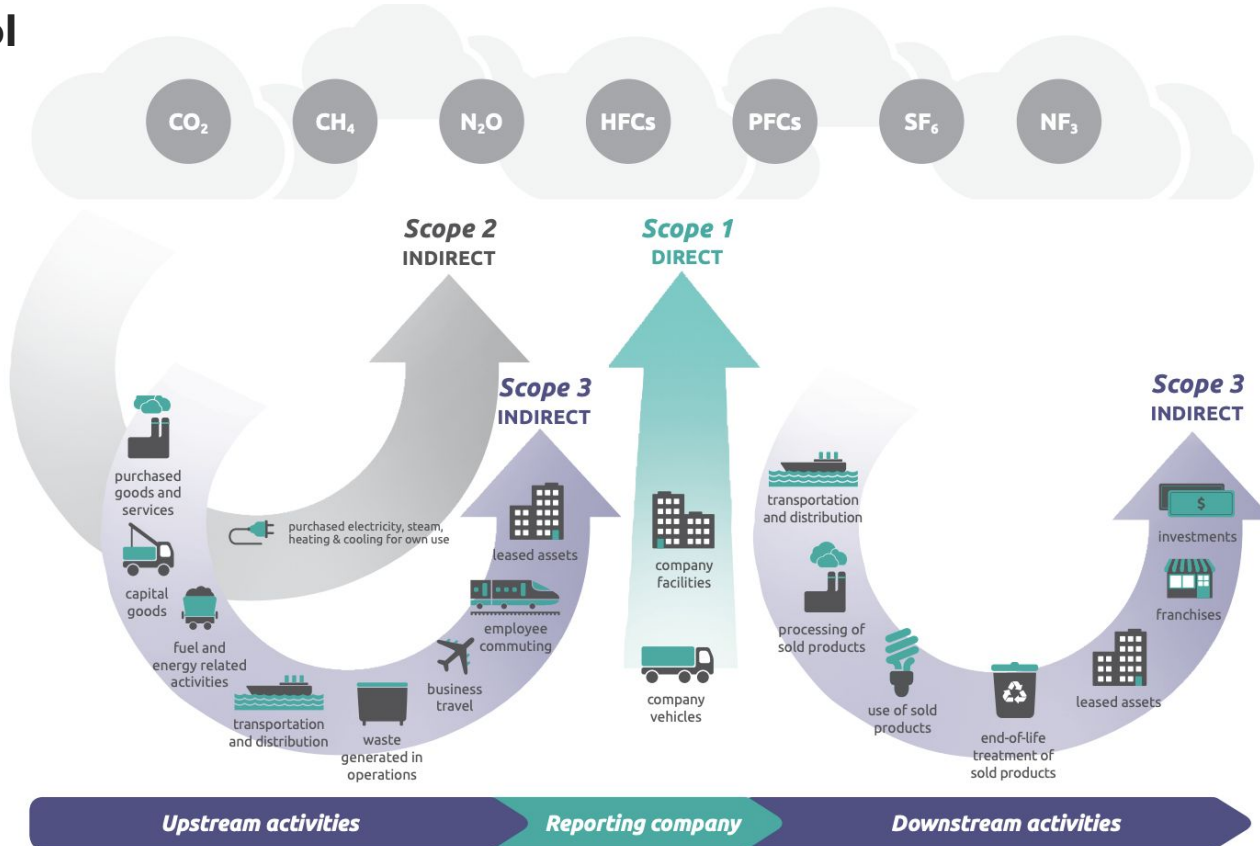


Larry Fink

CEO Black Rock

Importance of **collecting primary data**

Introduction GHG Protocol



Data collection



Secondary data

Primary data

As a starting point, we are using secondary data to estimate your emissions related to your production processes (materials and energy). Our secondary data is provided by Ecoinvent. Ecoinvent is comprehensive Life Cycle Assessment Tool (LCA) that provides extensive global coverage of emission factors from cradle to-grave. This allows us to build open modules to introduce you to data collection.

Our objective of this collaboration is to get more **accurate data, which is your primary data**. Primary data allows us to get activity-based information on your actual production processes (materials and energy). This allows for more accurate understanding of your data and Knorr-Bremse's scope 3 emissions.

To highlight, as part of primary data collection, calculated values of energy consumptions are recommended.

Objective of this collaboration

To better understand your production processes and collect your primary data.

Overview Data Requirements

Input Knorr-Bremse



Provided by Knorr-Bremse

- Weight of item (KB drawing)
- Name of item
- Supplier location
- Transaction amount

carbmee



- Material emitter match for each item
- Emissions calculations

Primary Data from supplier

- Confirm or change unit amount per item
- Add Materia(s) and/or recycled/secondary content
- Add Energy (electricity)
- If applicable: add fuel and direct emissions

Data Collection

Guide to use carbmee EIS



Your journey with Knorr-Bremse and carbmee

Continuous support from the carbmee Team

Stage 1 ✓
Invitation received via email from carbmee

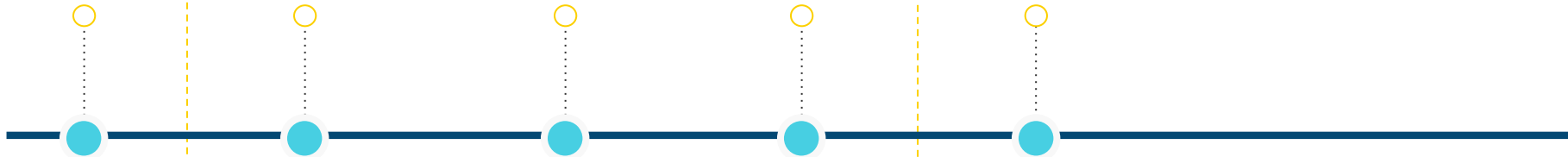
Stage 2 ✓
Create login details for the supplier view

Stage 3 ✓
Watch tutorials to fully understand the platform

Stage 4
Data Collection for all your relevant items

Stage 5
Data Validation from Knorr-Bremse

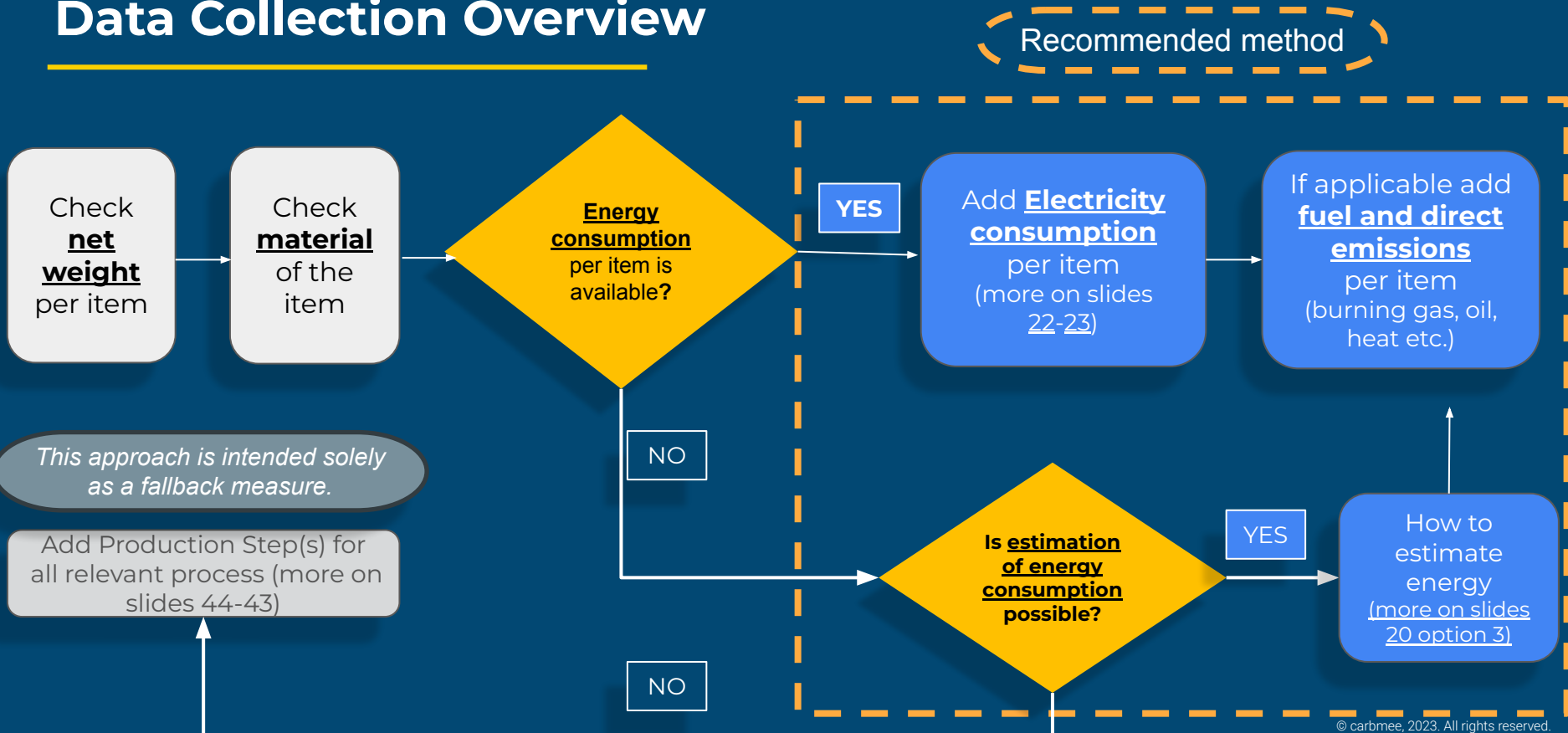
Short-term



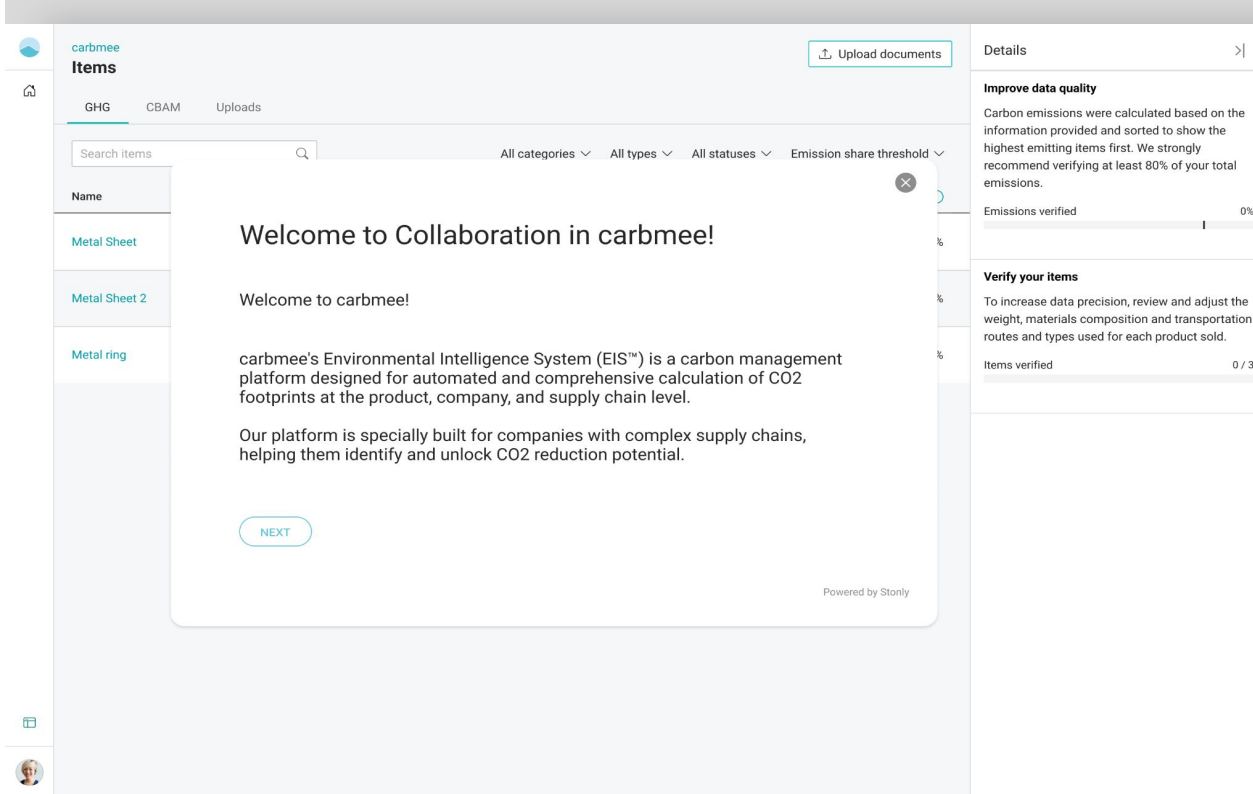
Supplier involvement

If the item has not passed validation it will be sent back to you to amend.

Data Collection Overview



Step 1: Complete the onboarding tutorial



The screenshot shows the carbmee platform interface. A modal window is open in the center, displaying a welcome message and a "NEXT" button. The background interface includes a sidebar with "Items" and a list of categories: "GHG", "CBAM", and "Uploads". The "Items" section has a search bar and filters for "All categories", "All types", "All statuses", and "Emission share threshold". The "Details" panel on the right shows "Improve data quality" and "Verify your items" sections, each with a progress indicator.

Welcome to Collaboration in carbmee!

Welcome to carbmee!

carbmee's Environmental Intelligence System (EIS™) is a carbon management platform designed for automated and comprehensive calculation of CO2 footprints at the product, company, and supply chain level.

Our platform is specially built for companies with complex supply chains, helping them identify and unlock CO2 reduction potential.

[NEXT](#)

Powered by Stonly

Details

Improve data quality

Carbon emissions were calculated based on the information provided and sorted to show the highest emitting items first. We strongly recommend verifying at least 80% of your total emissions.

Emissions verified 0%

Verify your items

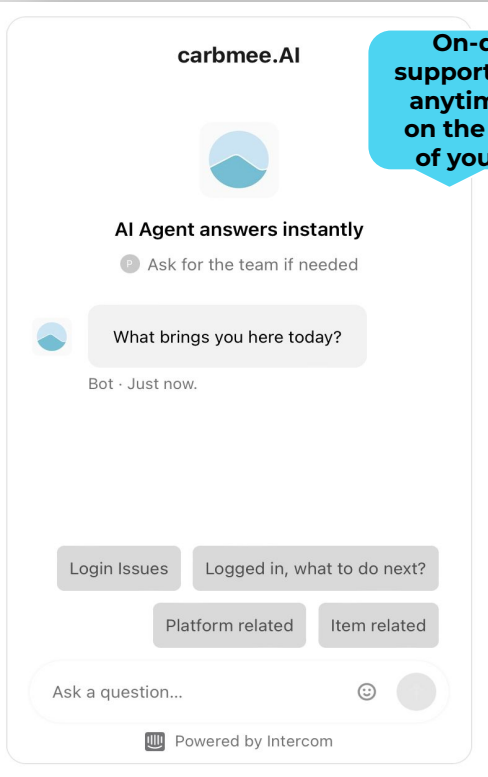
To increase data precision, review and adjust the weight, materials composition and transportation routes and types used for each product sold.

Items verified 0 / 3

Use the tutorial in the platform to get started

Our platform offers a on-demand tutorials to help you get started and understand the functionality.. Explore our step-by-step guides to make the most of carbmee EIS.

Step 1: In-platform, On-demand support



On-demand support. Available anytime. Found on the right side of your screen.

In-platform, on-demand ticket system

Our platform feature Intercom widget enables you to ask questions based on the suggestions given. We will recommend actions and articles, if we cannot solve your question in real time, it will create a ticket for you and we will respond within **3 working days**.

You will have also access to our comprehensive Help Center for detailed resources and solutions.

Step 1: Start with your high emissions items

carbmee Items Upload documents

GHG CBAM Uploads

Search items

All categories Type All statuses Emission share threshold

Name	Categories	Type	Supplier	Status	Share of emissions
Metal Sheet		Material	Smith Manufac...	In Review	52%
Metal Sheet 2		Material	Smith Manufac...	In Review	33%
Screw		Material	Smith Manufac...	Pending	14%
Metal ring		Material	Smith Manufac...	In Review	0%
Screw		Material	Smith Manufac...	In Review	0%

Details

Improve data quality
Carbon emissions were calculated based on the information provided and sorted to show the highest emitting items first. We strongly recommend verifying at least 80% of your total emissions.
Emissions verified 0%

Verify your items
To increase data precision, review and adjust the weight, materials composition and transportation routes and types used for each product sold.
Items verified 0 / 3

Start by working on your items from the top of your page to the bottom. All your items are organised from the highest emissions to the lowest.

Improve data quality:

See the percentage of items you've already verified.

Verify items:

See the number of items you've verified.

Step 2: Important: Check amount per item

The screenshot displays the 'Supplier View' interface. On the left, there is a sidebar with a home icon and a user profile icon. The main content area is titled 'Items' and 'Metal Sheet'. Below this, there are buttons for 'Add source', 'Emit amount', and 'Verify'. The 'Emit amount' button is circled in red. Below the buttons is a table of 'Emitting sources' with the following data:

Material ecoinvent	Production method	Location	Amount	Share of emissions
Brass	Brass production	Rest-of-world	7.5 kg	100%

Below the table is a '+ Add emitter' button. On the right side, there is a 'Details' panel with the following information:

- Amount: 7.5 kg (circled in red)
- Unit emissions: No access
- Total quantity: 0 kg
- Share of total emissions: 60.54 %
- Status: In review (The item is being reviewed by a collaborator.)
- General data: Type material
- Supplier: Smith Manufacturing - example supplier
- Custom properties: (0)

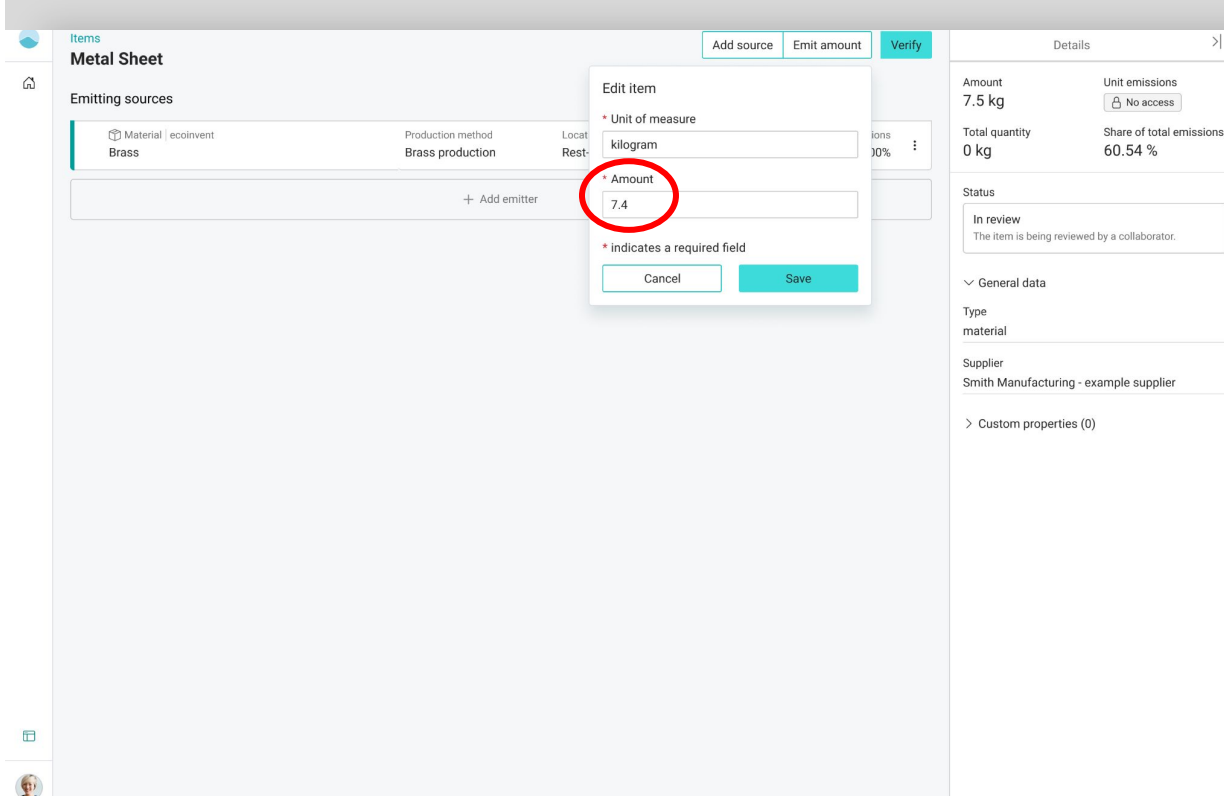
Check amount per item

In each item, on the right hand side, you will see the amount.

Gross weight of the 'one unit of item' provided by Knorr-Bremse.

This figure should never be the total for all items sold. It's just total of **one unit of item.**

Step 2: Important: Check amount per item



The screenshot displays the 'Supplier View' interface for a 'Metal Sheet' item. The 'Emitting sources' table shows one source: 'Brass' with a unit of 'kilogram' and an amount of '7.4'. The 'Edit item' dialog box is open, showing the 'Amount' field with the value '7.4' circled in red. The dialog also shows the 'Unit of measure' as 'kilogram' and a 'Save' button.

Material	Production method	Location	Unit of measure	Amount
Brass	Brass production	Rest	kilogram	7.4

Amount: 7.5 kg
Unit emissions: No access
Total quantity: 0 kg
Share of total emissions: 60.54 %

Status: In review
The item is being reviewed by a collaborator.

General data
Type: material
Supplier: Smith Manufacturing - example supplier
Custom properties (0)

Check amount per item

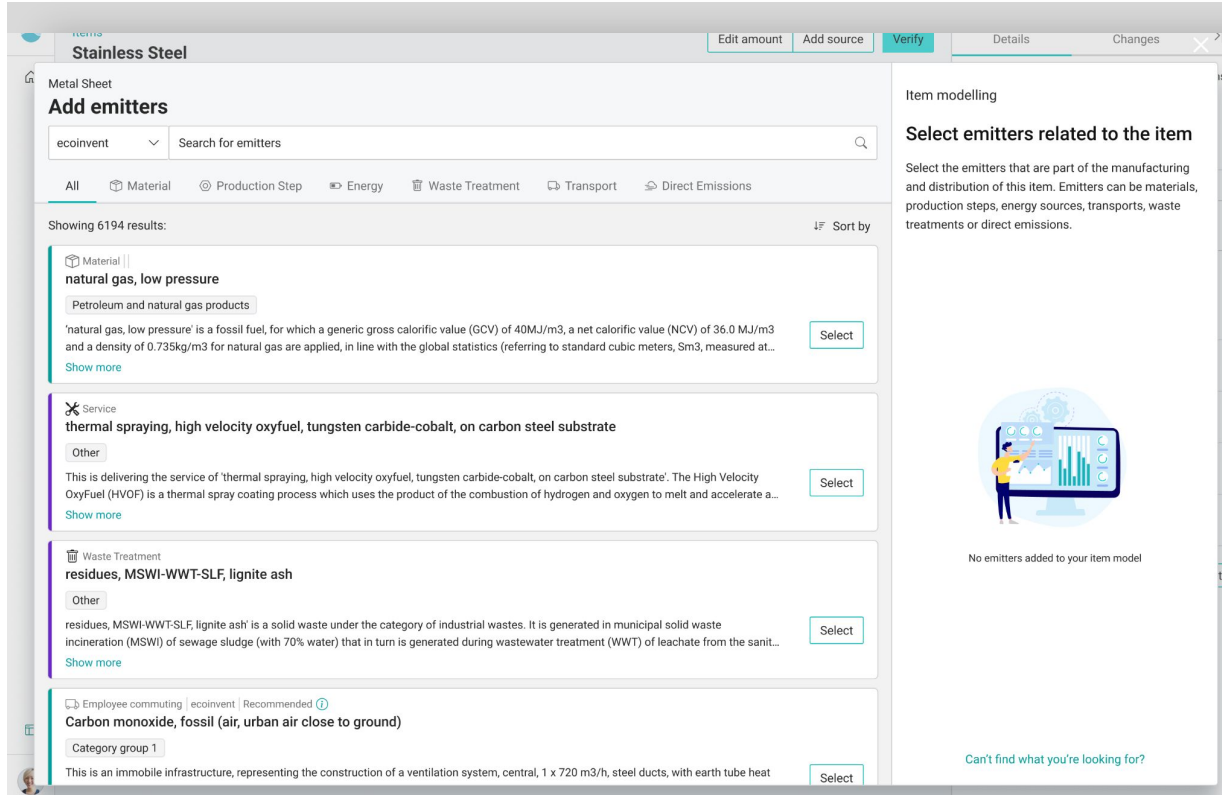
In each item, on the right hand side, you will see the amount.

Gross weight of the 'one unit of item' provided by Knorr-Bremse.

If the weight differs to your actual item, then you can edit the values for one unit of item.

For example, the metal sheet is actually 7.4 KG.

Step 2: Search functionality



The screenshot shows a software interface for searching emitters. The main title is "Stainless Steel". Below it, there's a search bar with "ecoinvent" selected and a search icon. A filter bar shows categories: All, Material, Production Step, Energy, Waste Treatment, Transport, and Direct Emissions. The results section shows 6194 results. Four results are visible, each with a "Select" button:

- Material**: natural gas, low pressure. Description: 'natural gas, low pressure' is a fossil fuel, for which a generic gross calorific value (GCV) of 40MJ/m³, a net calorific value (NCV) of 36.0 MJ/m³ and a density of 0.735kg/m³ for natural gas are applied, in line with the global statistics (referring to standard cubic meters, Sm³, measured at...)
- Service**: thermal spraying, high velocity oxyfuel, tungsten carbide-cobalt, on carbon steel substrate. Description: This is delivering the service of 'thermal spraying, high velocity oxyfuel, tungsten carbide-cobalt, on carbon steel substrate'. The High Velocity OxyFuel (HVOF) is a thermal spray coating process which uses the product of the combustion of hydrogen and oxygen to melt and accelerate a...
- Waste Treatment**: residues, MSWI-WWT-SLF, lignite ash. Description: residues, MSWI-WWT-SLF, lignite ash' is a solid waste under the category of industrial wastes. It is generated in municipal solid waste incineration (MSWI) of sewage sludge (with 70% water) that in turn is generated during wastewater treatment (WWT) of leachate from the sanit...
- Employee commuting**: Carbon monoxide, fossil (air, urban air close to ground). Description: This is an immobile infrastructure, representing the construction of a ventilation system, central, 1 x 720 m³/h, steel ducts, with earth tube heat

On the right side, there's a panel titled "Item modelling" with the heading "Select emitters related to the item". It contains the text: "Select the emitters that are part of the manufacturing and distribution of this item. Emitters can be materials, production steps, energy sources, transports, waste treatments or direct emissions." Below this is an illustration of a person at a computer monitor showing a bar chart. At the bottom of the panel, it says "No emitters added to your item model" and "Can't find what you're looking for?"

How to use the search functionality

You can search and filter on these **relevant categories**:

Search the name of the **Material/ Production Step/ Energy/ Waste Management/ Direct emission**

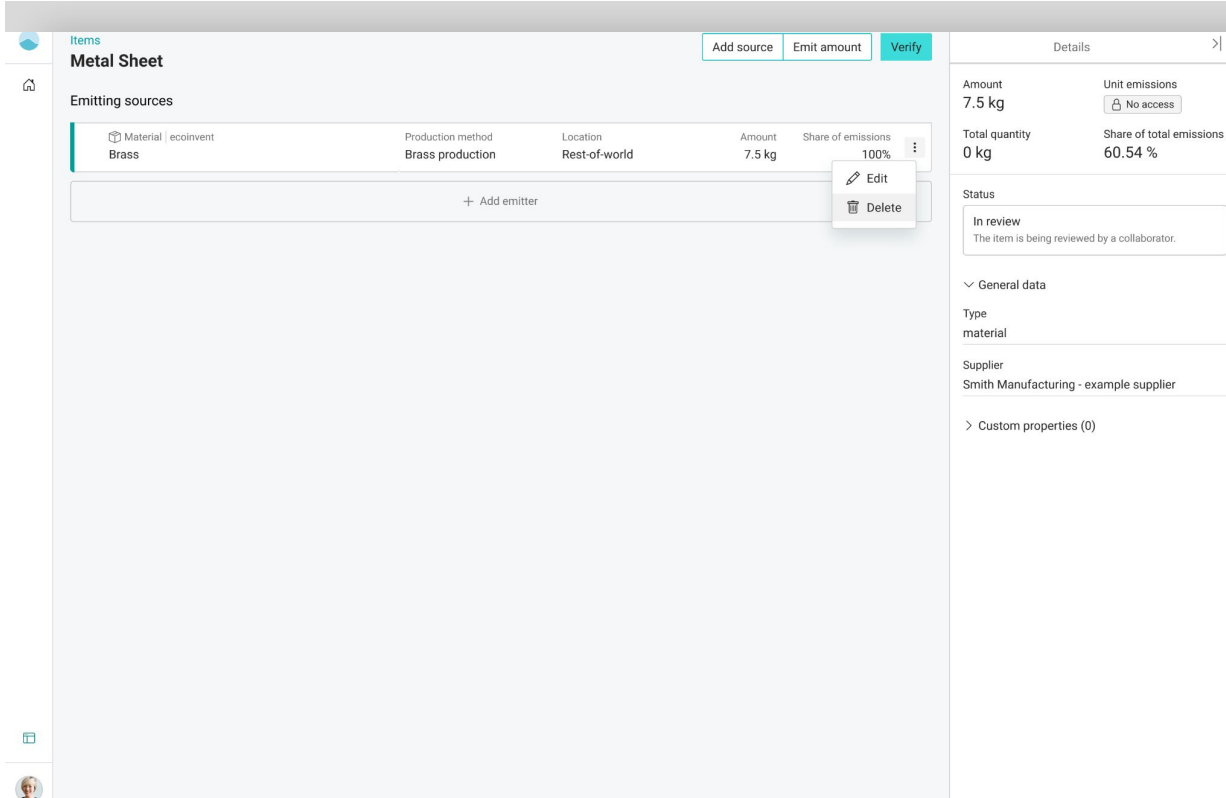
Available data sources:

1. Ecoinvent - default
2. carbmee database

When searching, select the category and add the simplest term of what you are looking for in the search function.

Tip: avoid adding the exact name of your for example material.

Step 3: Important: Needs to check: Material(s)



The screenshot displays the 'Supplier View' interface. At the top, there are three buttons: 'Add source', 'Emit amount', and 'Verify'. Below these is a 'Metal Sheet' header. The main area is titled 'Emitting sources' and contains a table with the following data:

Material ecoinvent	Production method	Location	Amount	Share of emissions	
Brass	Brass production	Rest-of-world	7.5 kg	100%	⋮

Below the table is a '+ Add emitter' button. A context menu is open over the table, showing 'Edit' and 'Delete' options. To the right, a 'Details' panel is visible, showing:

- Amount: 7.5 kg
- Unit emissions: No access
- Total quantity: 0 kg
- Share of total emissions: 60.54 %
- Status: In review (The item is being reviewed by a collaborator.)
- General data: Type: material
- Supplier: Smith Manufacturing - example supplier
- Custom properties (0)

Review and/or add new materials:

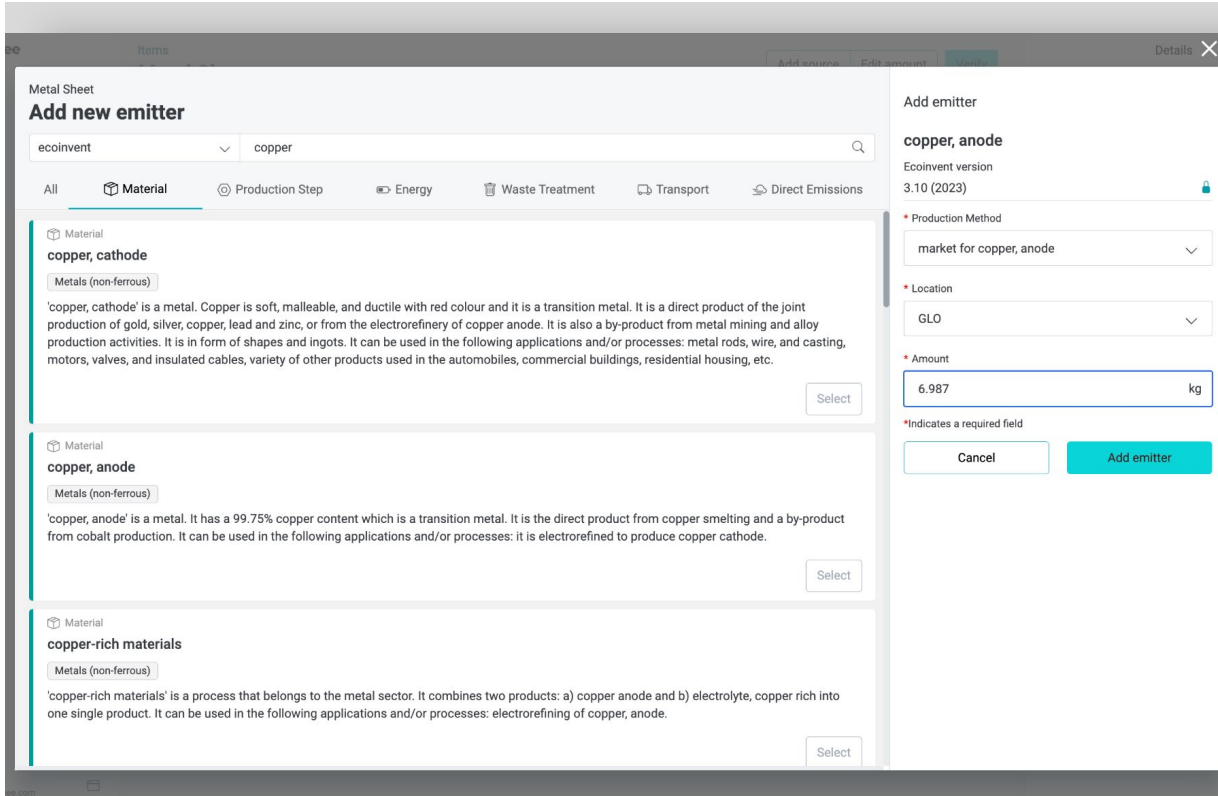
Each item will be matched to a material. This is our suggestion.

It's important that you review this material and if it's not a correct material, please remove it.

If its correct, please edit the weight.

To do so please click on the 3 dots to edit or delete it and add a different material(s) by selecting **+ Add emitter**.

Step 3: Adding emitters: Material(s)



Metal Sheet
Add new emitter

ecoinvent

All **Material** Production Step Energy Waste Treatment Transport Direct Emissions

Material
copper, cathode
Metals (non-ferrous)
'copper, cathode' is a metal. Copper is soft, malleable, and ductile with red colour and it is a transition metal. It is a direct product of the joint production of gold, silver, copper, lead and zinc, or from the electrorefinery of copper anode. It is also a by-product from metal mining and alloy production activities. It is in form of shapes and ingots. It can be used in the following applications and/or processes: metal rods, wire, and casting, motors, valves, and insulated cables, variety of other products used in the automobiles, commercial buildings, residential housing, etc.

Material
copper, anode
Metals (non-ferrous)
'copper, anode' is a metal. It has a 99.75% copper content which is a transition metal. It is the direct product from copper smelting and a by-product from cobalt production. It can be used in the following applications and/or processes: it is electrorefined to produce copper cathode.

Material
copper-rich materials
Metals (non-ferrous)
'copper-rich materials' is a process that belongs to the metal sector. It combines two products: a) copper anode and b) electrolyte, copper rich into one single product. It can be used in the following applications and/or processes: electrorefining of copper, anode.

Add emitter
copper, anode
Ecoinvent version
3.10 (2023)

* Production Method
market for copper, anode

* Location
GLO

* Amount
6.987 kg

*Indicates a required field

Cancel Add emitter

Add new emitter: Additional information

Once you've found the nearest emitter to your Material.

You need to complete 3 data fields.

1. Production Method:
Select **market for** "emitter name"

2. Location: Choose your location if available, if not please choose the nearest market:

Europe : RER

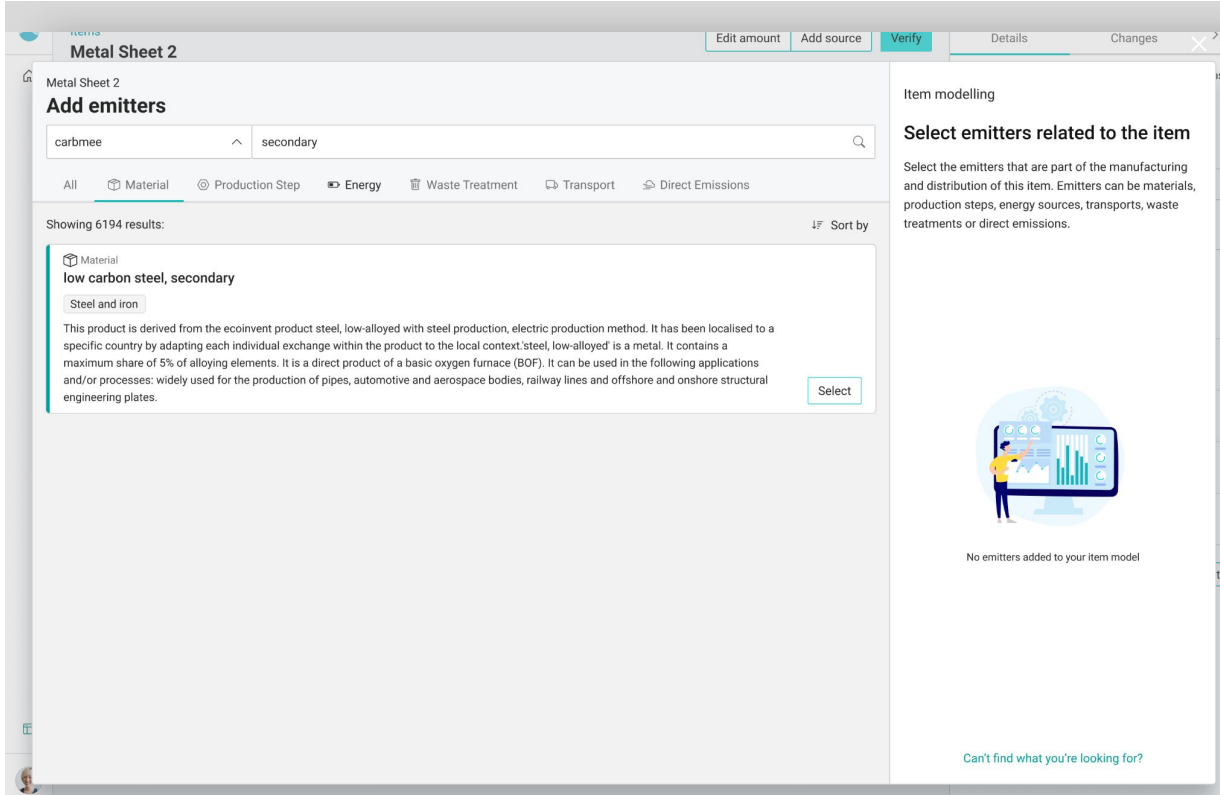
Asia: RAS

GLO: Global

RoW: Rest of the World

3. Amount: Needs to be added per unit for your item.

Emitter: Material - recycled (secondary)



Metal Sheet 2

Edit amount Add source **Verify** Details Changes

Metal Sheet 2

Add emitters

carbmee secondary

All **Material** Production Step Energy Waste Treatment Transport Direct Emissions

Showing 6194 results: Sort by

Material
low carbon steel, secondary
Steel and iron


This product is derived from theecoinvent product steel, low-alloyed with steel production, electric production method. It has been localised to a specific country by adapting each individual exchange within the product to the local context.'steel, low-alloyed' is a metal. It contains a maximum share of 5% of alloying elements. It is a direct product of a basic oxygen furnace (BOF). It can be used in the following applications and/or processes: widely used for the production of pipes, automotive and aerospace bodies, railway lines and offshore and onshore structural engineering plates.

Select

Item modelling

Select emitters related to the item

Select the emitters that are part of the manufacturing and distribution of this item. Emitters can be materials, production steps, energy sources, transports, waste treatments or direct emissions.



No emitters added to your item model

Can't find what you're looking for?

Adding recycled material

Database: change to carbmee

Search: Secondary

You will see our current secondary materials (which means recycled), you can add them as you would with any other material corresponding to the total item amount.

We are adding more recycled (secondary) materials every quarter.

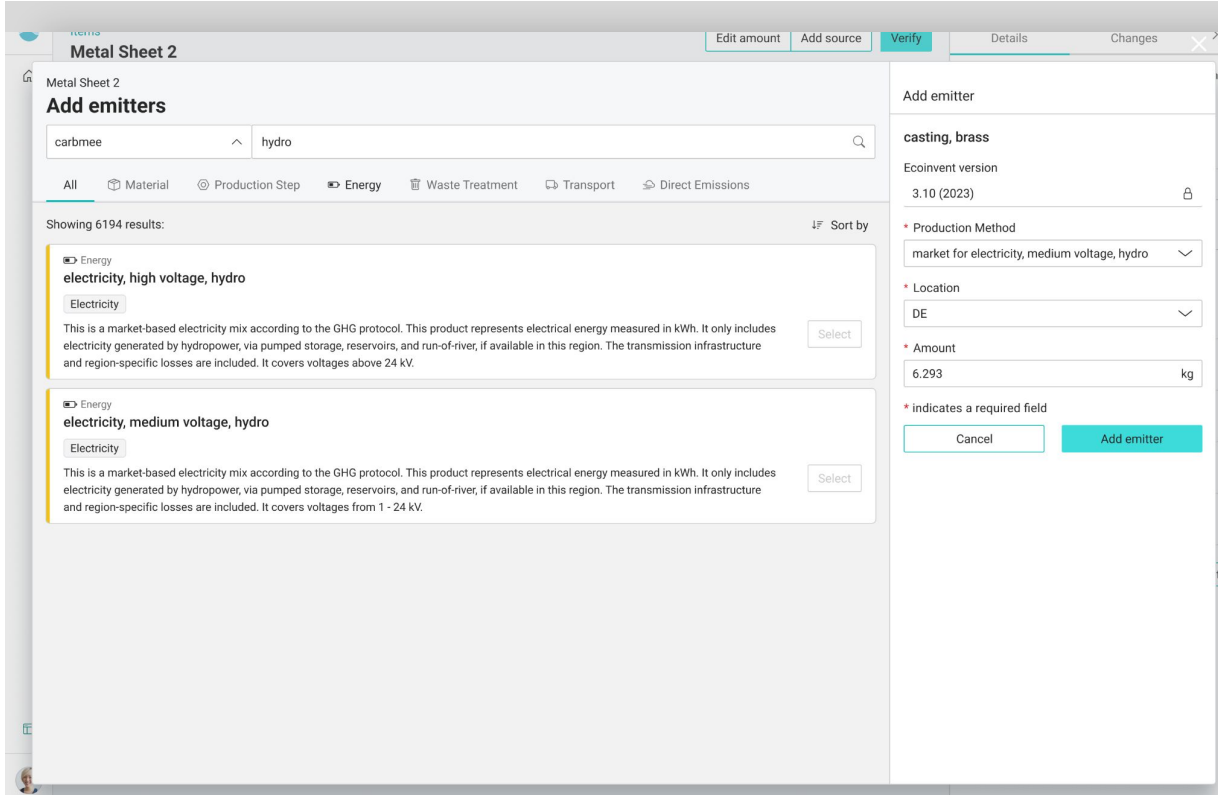
Step 3: Adding emitters: Energy

The screenshot shows the 'Metal Sheet 2' interface. On the left, the 'Add emitters' search results are displayed. A search bar contains 'ecoinvent'. Below it, a list of emitters is shown: 'ecoinvent', 'exiobase', 'carbmee', and 'cbam'. The 'ecoinvent' emitter is selected. Below the list, there are four entries for 'cooling energy' at different temperatures: -25 °C, -15 °C, -55 °C, and -45 °C. Each entry has a 'Select' button. On the right, the 'Item modelling' panel is visible. It has a heading 'Select emitters related to the item' and a sub-heading 'Select the emitters that are part of the manufacturing and distribution of this item. Emitters can be materials, production steps, energy sources, transports, waste treatments or direct emissions.' Below this text is an illustration of a person standing next to a large screen displaying a bar chart and a globe. Underneath the illustration, it says 'No emitters added to your item model'. At the bottom of the panel, there is a link that says 'Can't find what you're looking for?'.

Energy: selecting the correct data source

1. Default - Ecoinvent:
For most energy emitters
2. carbmee:
For renewable energy emitters

Step 3: Adding emitters: Energy



Metal Sheet 2

Edit amount Add source Verify Details Changes

Add emitters

carbmee hydro

All Material Production Step Energy Waste Treatment Transport Direct Emissions

Showing 6194 results: Sort by

Energy
electricity, high voltage, hydro
Electricity
This is a market-based electricity mix according to the GHG protocol. This product represents electrical energy measured in kWh. It only includes electricity generated by hydropower, via pumped storage, reservoirs, and run-of-river, if available in this region. The transmission infrastructure and region-specific losses are included. It covers voltages above 24 kV. Select

Energy
electricity, medium voltage, hydro
Electricity
This is a market-based electricity mix according to the GHG protocol. This product represents electrical energy measured in kWh. It only includes electricity generated by hydropower, via pumped storage, reservoirs, and run-of-river, if available in this region. The transmission infrastructure and region-specific losses are included. It covers voltages from 1 - 24 kV. Select

Add emitter

casting, brass

Ecoinvent version
3.10 (2023)

* Production Method
market for electricity, medium voltage, hydro

* Location
DE

* Amount
6.293 kg

* indicates a required field


Cancel Add emitter

Add new emitter: Additional information

You need to complete 3 data fields.

1. Production Method:
Select **market for** "emitter name"
2. Location:
Choose your location
3. Amount:
Total for this specific energy used to produce this unit of tem

Step 3: Energy: upload your methodology

 carbmee

[Home](#) [Back](#) ✕

Upload your documents

To ensure your data is shared securely, please upload your files below.
After analysing the quality and format of the data, we will get back to you with the next steps.

Which supplier is your document for?

Smith Manufacturing - example supplier ▾

What is the context of your documents?

CBAM GHG


Document type:


PCF Certificate


Product Specification

Other

Methodology for calculated electricity - Metal Sheet


Drag file to upload or
[+ Select file](#)



suppliersupport
demo.demo.carbmee.com 

Energy: Upload your methodology

If you've had to calculate your energy consumption for example from your energy bill.

Please upload the methodology in the **Uploads** sections. Simple Word

Step 3: Natural Gas: adding fuels

Metal Sheet 2

Add new emitter

ecoinvent

All **Material** Production Step Energy Waste Treatment Transport Direct Emissions

Material

natural gas, low pressure

Petroleum and natural gas products

'natural gas, low pressure' is a fossil fuel, for which a generic gross calorific value (GCV) of 40MJ/m³, a net calorific value (NCV) of 36.0 MJ/m³ and a density of 0.735kg/m³ for natural gas are applied, in line with the global statistics (referring to standard cubic meters, Sm³, measured at 15°C and 1013 mbar). It is used as a gaseous fuel and is sourced from oil and gas production and evaporation of liquid natural gas. Local distribution of natural gas for residential, commercial, and small industrial users in low-pressure networks with an overpressure below 0.1 bar.

Select

Material

natural gas, vented

Petroleum and natural gas products

'natural gas, vented' describes the emissions due to the venting of natural gas during crude oil production.

Select

Material

natural gas, high pressure

Add emitter

natural gas, low pressure

Ecoinvent version
3.10 (2023)

* Production Method
market for natural gas, low pressure

* Location
DE

* Amount
1.13 m³

*Indicates a required field

Cancel Add emitter

Energy: Natural Gas

Search appropriate fuel in material section

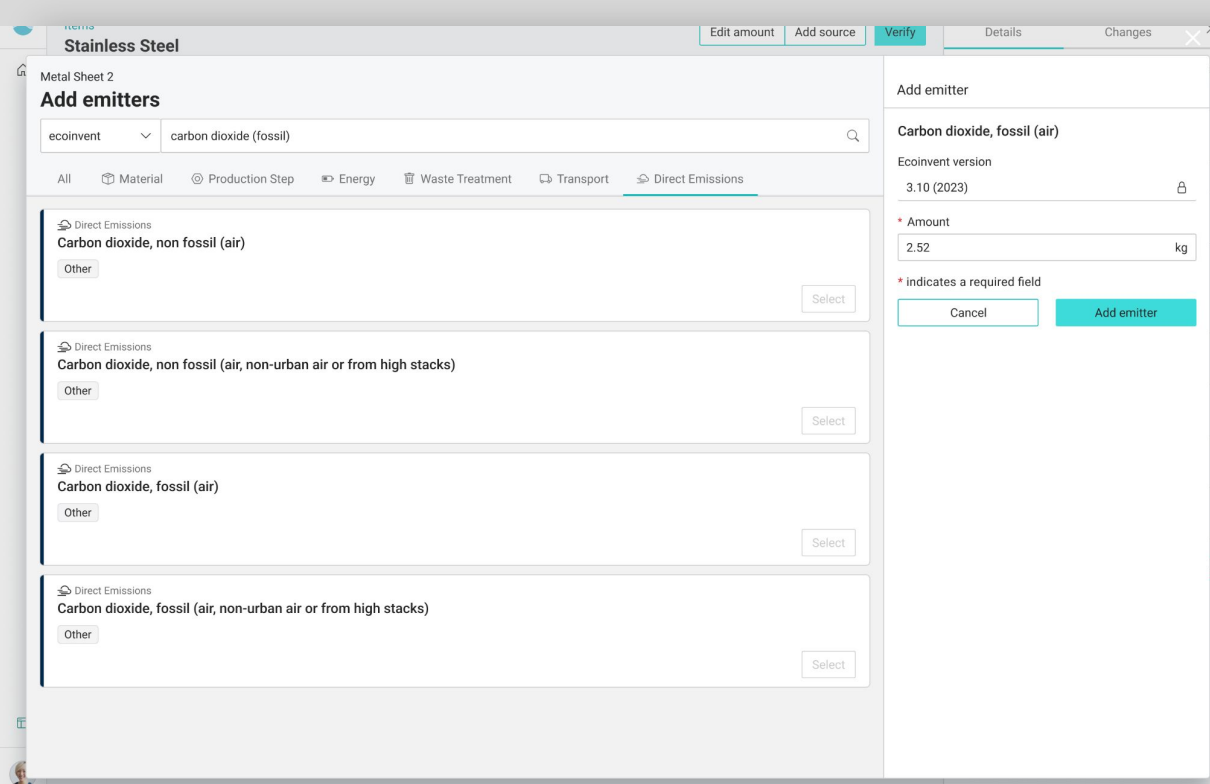
You need to complete 3 data fields.

1. Production Method:
Select **market for** "emitter name"

2. Location:
Choose your location

3. Amount:
Total for this specific energy used to produce this unit of tem

Step 3: Adding emitters: Direct Emissions



The screenshot shows the 'Supplier View' interface for 'Stainless Steel'. The main panel is titled 'Add emitters' and displays a search bar with 'ecoinvent' and 'carbon dioxide (fossil)'. Below the search bar, there are tabs for 'All', 'Material', 'Production Step', 'Energy', 'Waste Treatment', 'Transport', and 'Direct Emissions'. The 'Direct Emissions' tab is active, showing a list of four emission categories, each with an 'Other' button and a 'Select' button:

- Carbon dioxide, non fossil (air)
- Carbon dioxide, non fossil (air, non-urban air or from high stacks)
- Carbon dioxide, fossil (air)
- Carbon dioxide, fossil (air, non-urban air or from high stacks)

The right-hand panel shows the 'Add emitter' form for 'Carbon dioxide, fossil (air)'. It includes the 'Ecoinvent version' (3.10 (2023)) and a required field for 'Amount' (2.52 kg). The form has 'Cancel' and 'Add emitter' buttons.

Add new emitter: Direct Emissions

Some production processes have direct emissions associated (for example emissions from using gas).

You can directly add emissions in the category **Direct Emissions**, search for the relevant emitter for example **Carbon dioxide, fossil (air)** and just add the total **kg**.

Step 3: Adding emitters: Waste Treatment (optional)

The screenshot shows the 'Add emitter' interface for 'municipal solid waste'. The 'Amount' field is highlighted with a red circle and contains the value '-0.82'.

Waste Treatment
electricity, for reuse in municipal waste incineration only
 Waste Management
 This product represents electrical energy measured in kWh. If electricity is taken from a market for electricity, the transmission infrastructure, country-specific losses and transformation losses (for markets for medium and low voltage) are included. Covers voltages between 1kV and 24...

Waste Treatment
municipal solid waste
 Waste Management
 'municipal solid waste' is a solid waste under the category of residential wastes. It can be sourced in many and various ways and therefore it can belong in all waste categories (commercial and institutional, industrial and construction and demolition). It is primarily generated in a wide range of activities from many different sectors. 'municipal solid waste' contain the following fractions: plastics, paper, glass, metals, organic waste, textiles and potentially others... By the database default (and per unit of reference product), 'municipal solid waste' has 22.9% water on wet mass basis (77.1% dry matter) and Carbon present is of both fossil (17.15% on a dry matter basis), and non-fossil origin (26.17% on a dry matter basis). It has a lower heating value of 11.74 MJ/kg. This kind of by-product (recyclable or waste) is generated from ordinary transforming activities, and as such can be considered for modelling waste outputs of comparable composition. In the ecoinvent database, treatment option/s for this by-product include: deposition (sanitary landfill, unsanitary landfill), thermal (municipal incineration), uncontrolled forms of disposal (open dump, open burning). Based on the aforementioned treatments, this by-product receives, it is a non-hazardous waste. In addition, this by-product is used in the following processes: clinker production; treatment of municipal solid waste, incineration. This by-product can be modelled on two levels: treatment activity and market activity. The former one refers to the specific technology treating the by-product while the latter level re-represents a mix of treatments. Users are encouraged to inspect the modelling assumptions of the treatment activities and when selecting the

Waste Treatment
sewage sludge, 97% water, WWT, rainwater mineral oil storage
 Waste Treatment
 sewage sludge, 97% water, WWT, rainwater mineral oil storage' is a liquid waste under the category of industrial wastes. This sewage sludge is produced exclusively in the wastewater treatment (WWT) of 'rainwater mineral oil storage'. The composition of the sewage sludge, is specific to...

Add emitter
municipal solid waste
 Ecoinvent version
 3.10 (2023)
 * Production Method
 market for municipal solid waste
 * Location
 DE
 * Amount
 -0.82 kg
 * indicates a required field
 Cancel Add emitter

Add new emitter: Additional information

Only if waste generated is leaving the production site, then it can be added as waste treatment.

You need to complete 3 data fields.

1. Production Method:
Select **market for** "emitter name"

2. Location:
Choose your location

3. Amount:
Waste treat. is an **output and therefore needs to be negative figure** (for example -0.82). Please do not forget the - sign.

Last step: Check your item before you verify

Items

Metal Sheet 2

Add source Edit amount **Verify**

Details

Amount: 7.5 kg Unit Emissions: No access

Total quantity: 375 kg Share of total emissions: 39.228 kg %

Status: In review
The item is being reviewed by a collaborator.

General data

Type: material

Supplier: Smith Manufacturing - example supplier

Custom Properties (1)

Material ecoinvent	Production Method	Location	Amount	Share of emissions
Copper, anode	Market for copper, anode	Global	6.987 kg	77 %
Tin	Market for tin	Global	0.411 kg	8 %
Lead	Market for lead	Global	0.411 kg	1 %
Zinc	Market for zinc	Global	0.411 kg	2 %
Energy carbmee	Market for electricity, medium voltage, ...	Germany	6.293 kwh	5 %
Energy carbmee	Market for electricity, medium voltage, ...	Germany	2.697 kwh	1 %
Natural gas, low pressure	Market for natural gas, low pressure	Germany	1.13 m³	2 %
Direct Emissions ecoinvent	Carbon dioxide, fossil (air)		2.52 kg	4 %

+ Add emitter

Check your item

It's important to make sure all relevant emitters have been added.

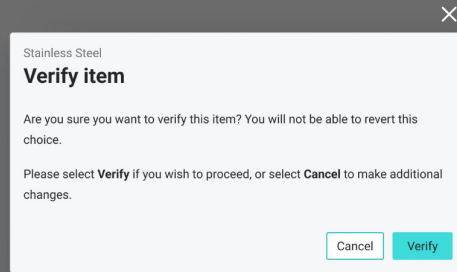
Check list:

- Material(s)
- Energy

Once you are done, you can select **Verify** - this will lock your ability to edit more data, and Knorr-Bremse will review your item.

This means you are finish with your data collection. THANK YOU!

Last step: Verify your item



Once you verify, you cannot edit your item.

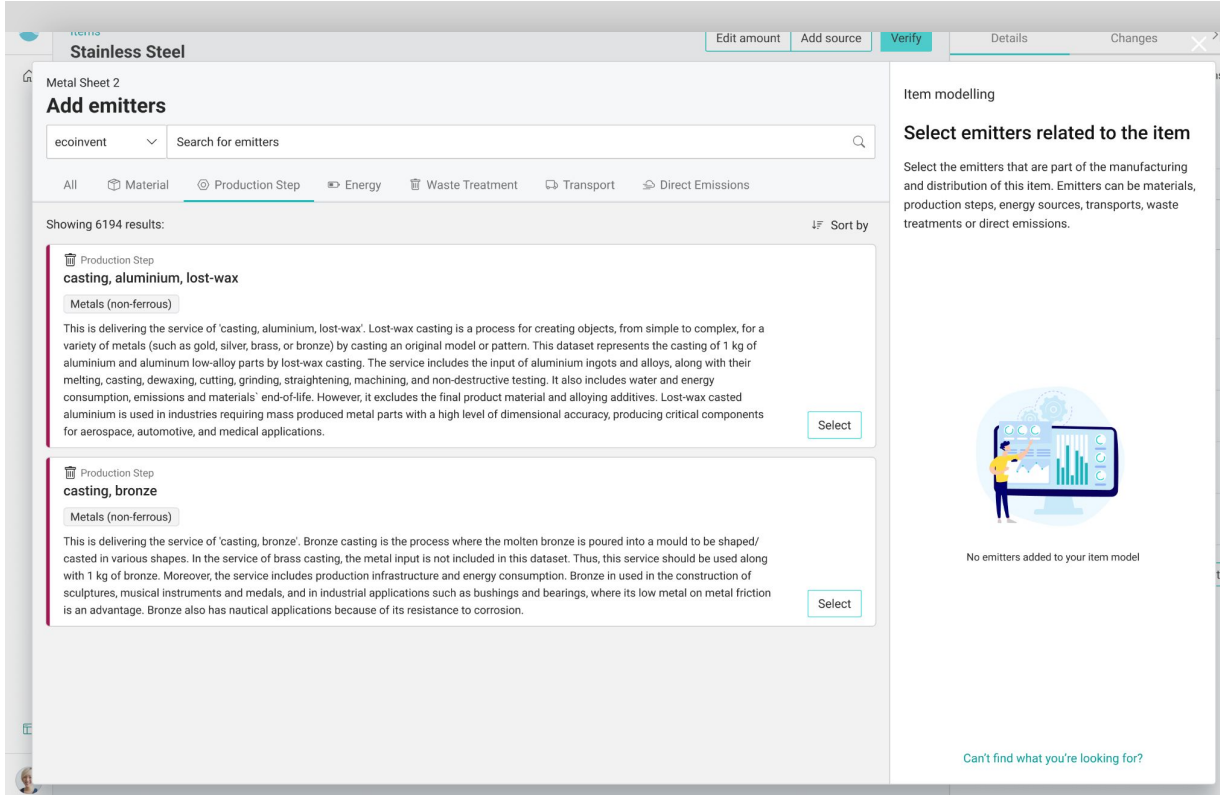
If you've checked your item, please select verify.

This means Knorr-Bremse will review it and get back to you via the platform if more information is needed.

Data Collection **Alternative method**



If energy data is not available: production steps



The screenshot shows the 'Add emitters' interface for 'Stainless Steel'. The search bar contains 'ecoinvent' and 'Search for emitters'. The 'Production Step' filter is selected, showing 6194 results. Two production steps are visible:

- Production Step: casting, aluminium, lost-wax** (Metals (non-ferrous))

This is delivering the service of 'casting, aluminium, lost-wax'. Lost-wax casting is a process for creating objects, from simple to complex, for a variety of metals (such as gold, silver, brass, or bronze) by casting an original model or pattern. This dataset represents the casting of 1 kg of aluminium and aluminium low-alloy parts by lost-wax casting. The service includes the input of aluminium ingots and alloys, along with their melting, casting, dewaxing, cutting, grinding, straightening, machining, and non-destructive testing. It also includes water and energy consumption, emissions and materials' end-of-life. However, it excludes the final product material and alloying additives. Lost-wax casted aluminium is used in industries requiring mass produced metal parts with a high level of dimensional accuracy, producing critical components for aerospace, automotive, and medical applications.
- Production Step: casting, bronze** (Metals (non-ferrous))

This is delivering the service of 'casting, bronze'. Bronze casting is the process where the molten bronze is poured into a mould to be shaped/casted in various shapes. In the service of brass casting, the metal input is not included in this dataset. Thus, this service should be used along with 1 kg of bronze. Moreover, the service includes production infrastructure and energy consumption. Bronze is used in the construction of sculptures, musical instruments and medals, and in industrial applications such as bushings and bearings, where its low metal on metal friction is an advantage. Bronze also has nautical applications because of its resistance to corrosion.

The right sidebar shows 'Item modelling' with the heading 'Select emitters related to the item'. It includes a description: 'Select the emitters that are part of the manufacturing and distribution of this item. Emitters can be materials, production steps, energy sources, transports, waste treatments or direct emissions.' Below this is an illustration of a person interacting with a data visualization screen. A message states: 'No emitters added to your item model'. At the bottom, there is a link: 'Can't find what you're looking for?'.

Alternative method: Adding Production steps

Introduction to Production Step:

If you do not have energy available (even estimates), **the 2nd option will be to add production steps.** Adding production steps allows us to estimate your production steps.

Only add production step(s) if you have not added energy for the same production process to avoid double counting.

Add relevant Production Step(s)

The screenshot shows the 'Add emitters' dialog in the Supplier View interface. The main window displays 'Stainless Steel' and 'Metal Sheet 2'. The 'Add emitters' search bar is set to 'ecoinvent' and 'casting'. Below the search bar, there are tabs for 'All', 'Material', 'Production Step', 'Energy', 'Waste Treatment', 'Transport', and 'Direct Emissions'. The 'Production Step' tab is selected, showing 6194 results. Two results are visible: 'casting, steel, lost-wax' and 'casting, brass'. The 'casting, brass' result is selected, and the 'Add emitter' dialog is open. The dialog shows the following details:

- Add emitter:** casting, brass
- Ecoinvent version:** 3.10 (2023)
- Production Method:** market for casting, brass
- Location:** GLO
- Amount:** 6.987 kg

The dialog also includes a 'Cancel' button and an 'Add emitter' button. A note indicates that the asterisk (*) denotes a required field.

Adding emitters: Production steps

1. Find the closest emitter to your production process
2. Add **Production Method** as market for "name of the emitter"
3. Select appropriate **Location**
4. Add the **Amount** again to correspond to the unit amount of your item.

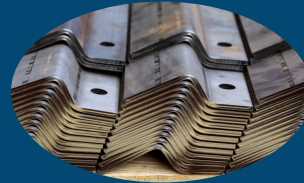
Data collection Example

Example Item

Example of a metal sheet as an item

Example Item: Metal Sheet - **7.4KG per unit**

Your item



Inputs

Material(s)

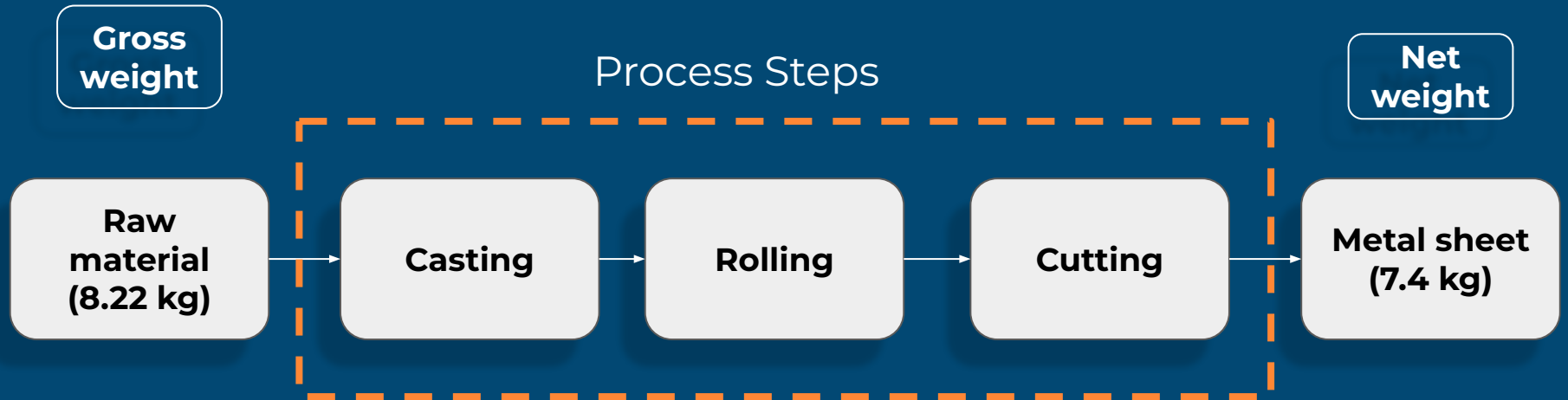


Energy

Example Item

Metal sheet production: process flow chart

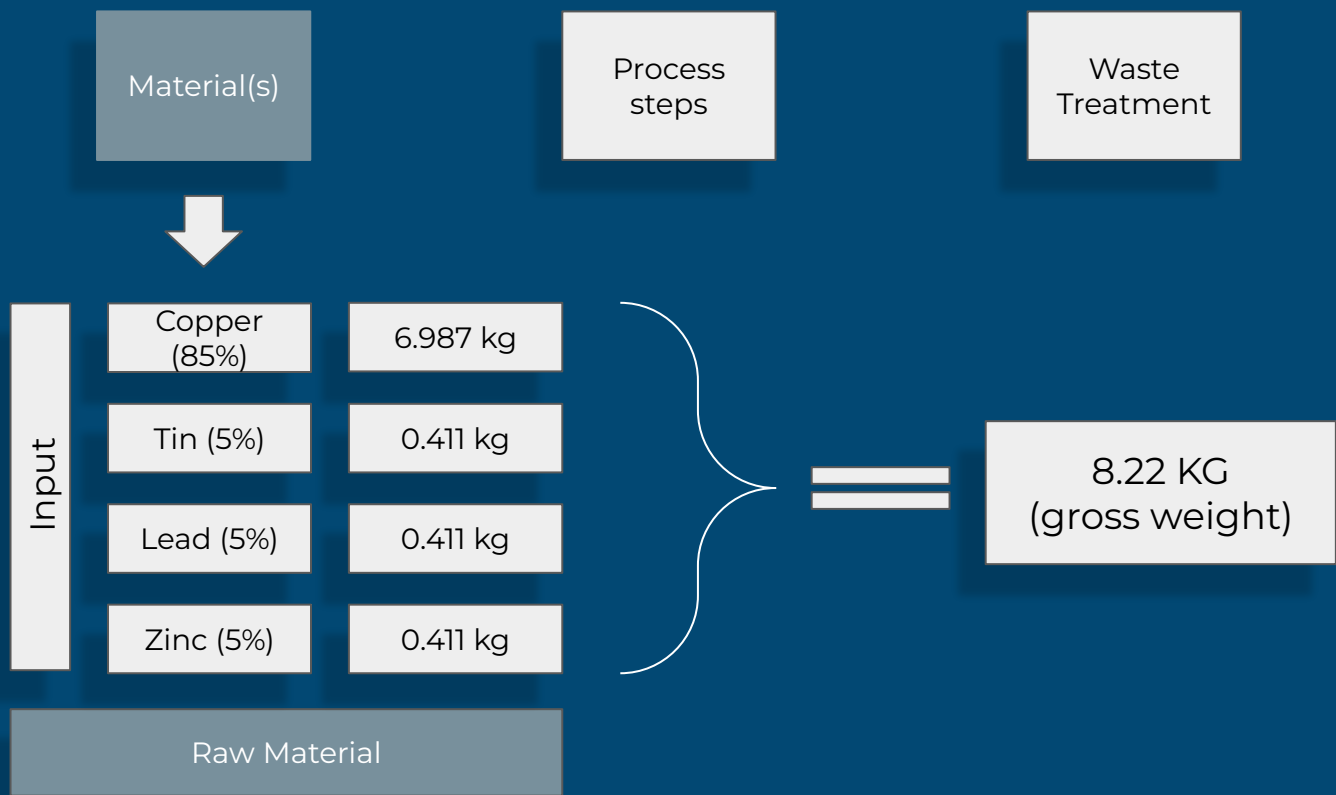
Example Item: Metal Sheet - **7.4KG per unit**



Example Item

Material(s): What you need to add for each item

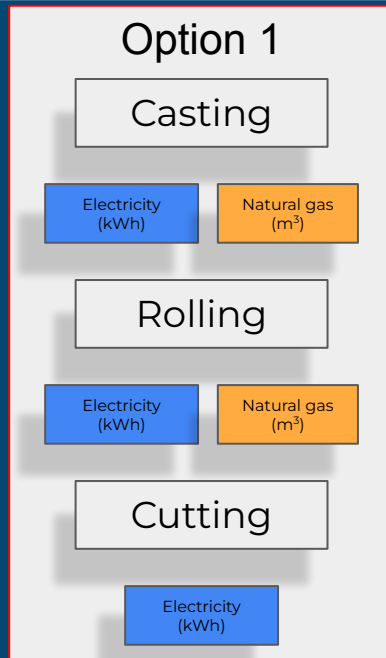
Example Item: Metal Sheet - **7.4KG per unit**



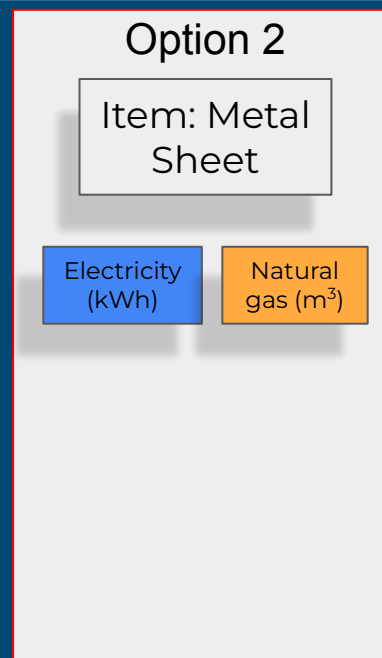
Example Item

3 options to calculate energy per item

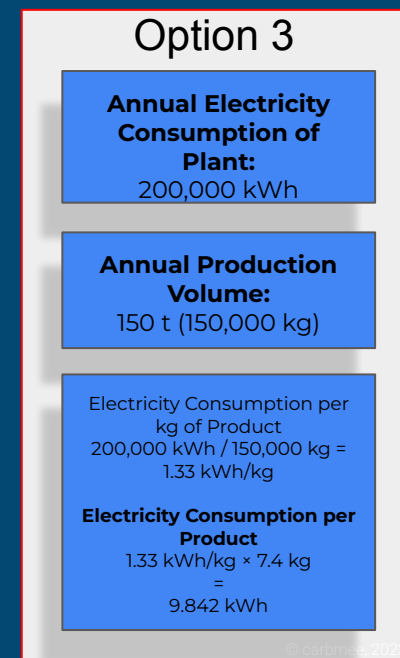
You know your energy consumption for each process step
> just sum up and put in the total value



You know your total energy consumption of the complete process that is producing the item > just put in the total value / item



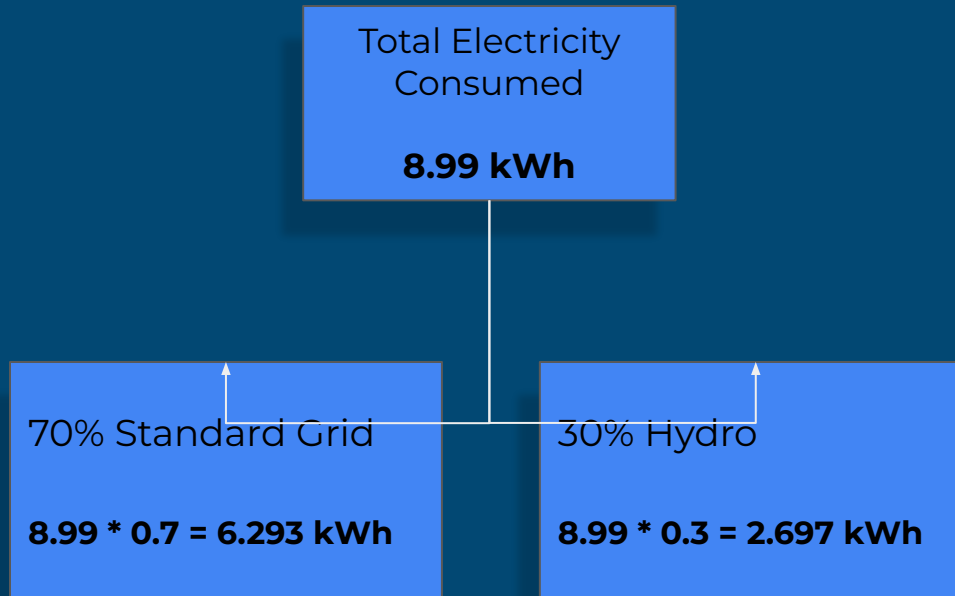
You just know your annual energy consumption for the plant producing the item and your total production volume > break it down to item level



Example Item

Adding different types of electricity

Example Item: Metal Sheet -
7.4KG per unit

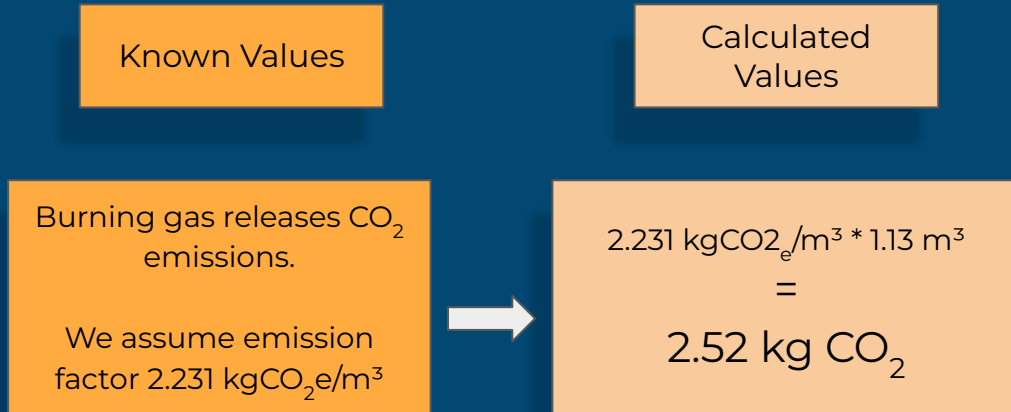


Example Item

Calculating direct emissions

Calculate direct emissions if applicable. For example when burning gas, there are associated carbon emissions that need to be accounted for separately.

Example Item: Metal Sheet - **7.4KG per unit**



Other examples

Fuel	Emission factor	Unit
LPG	1.47	kgCO ₂ e/litre
Light fuel oil	2.93	kgCO ₂ e/litre
Heavy fuel oil	3.02	kgCO ₂ e/litre
Hard coal	2.64	kgCO ₂ e/kg
Lignite	1.21	kgCO ₂ e/kg

Time for questions

Frequently Asked Questions by suppliers:

Question	Answer
I have already calculated a PCF without carbmee, can I submit that instead?	Yes, If you have already calculated your product carbon footprint (PCF) with a certified body, you have the option to upload the pre-calculated emissions without modelling. You have detailed guidance of exactly how to do this inside the product.
How does carbmee protect my data?	carbmee follows a series of policies to protect your data and prevent any risks associated with information security, including cloud hosting European servers, using SSO and being ISO 27001 compliant. Only you and your customer will have access to the data you provide. It will be kept in an isolated and secure location in order to protect privacy.
I can only share data after signing an NDA, is it possible to sign one?	Yes, if an NDA is required, please contact our team afterwards in order to set up an NDA before starting.
What databases does carbmee use?	carbmee's EIS is a multi-database platform that uses Ecoinvent (activity-based), Exiobase (spend-based) and our extensive proprietary database.
What should I do if I can't find an emissions factor in carbmee?	If you can't find the emissions factor you are looking for, please contact the carbmee support team using THIS LINK .
What if I receive material directly from KB, do I need to include it into carbmee?	No, if you receive your material from Knorr-Bremse. Only add your production steps or energy into the platform. As the material is already captured.

Meet your **team, that is here to support YOU**



END-TO-END GUIDANCE

Benefit from in-platform guidance, webinars, and information-rich resources. We're here to support you at every step of your journey.



IN-HOUSE EXPERTISE

Tap into our diverse in-house expertise, spanning sustainability, carbon accounting, and supply chains.



ON-DEMAND SUPPORT

Tailored support, regardless of supplier maturity.

Meet your team



Leona Mrackova

Supplier Engagement

Project Lead your primary point of contact and responsible for delivery of engagement and general sustainability guidance.

**CLICK HERE TO REQUEST
SUPPORT FROM CARBMEE**

Thanks for your attention

carbmee Team

Please contact our Supplier Engagement
Team on:
suppliersupport@carbmee.com

For more information about us: www.carbmee.com