Internal How-To Guide

EcoSpend

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1. Introduction to Sustainability Reporting

1.1. What is the Corporate Sustainability Reporting Directive (CSRD)?

Companies embarking on their sustainability reporting journey often encounter a host of unfamiliar terms, which can lead to initial confusion about distinguishing between the "Corporate Sustainability Reporting Directive" (CSRD), the " Non-Financial Reporting Directive" (NFRD), and the "EU Taxonomy."

The CSRD is an EU Directive that amends the scope and the reporting requirements of the Non-Financial Reporting Directive (NFRD). While the NFRD only provided guidelines for ESG reporting, the CSRD will introduce mandatory reporting standards.

The Corporate Sustainability Reporting Directive (CSRD), building on the Non-Financial Reporting Directive (NFRD), mandates greater transparency in sustainability reporting for companies operating within the EU. This directive applies to all large companies and those listed on regulated markets, excluding listed micro-enterprises, thereby affecting over 50,000 companies in the EU.

The European Sustainability Reporting Standards (ESRS), developed by EFRAG, outline comprehensive guidelines for reporting on sustainability performance, encompassing environmental, social, and governance (ESG) factors.

Companies must disclose their environmental impact, including details on greenhouse gas emissions, water usage, and pollution. The standards also address social issues like employee rights, diversity and inclusion, and community engagement. Governance aspects such as corporate ethics, risk management, and legal compliance are also covered.

The CSRD highlights the double materiality perspective, considering both the impact of the company on sustainability issues and the effect of these issues on the company. The aim is to ensure consistent and comparable sustainability reporting across various companies and sectors. The CSRD introduces the 'European Single Electronic Format' (ESEF) for digital reporting, using the XBRL format to facilitate the accessibility and analysis of sustainability information, which will be finalized following the current public consultation.

Sustainability reports under the CSRD will require auditing to ensure reliability and accuracy. The CSRD reporting aligns with the EU Taxonomy, a classification system that defines environmentally sustainable economic activities. While the CSRD primarily focuses on the EU, it will have global implications due to the international operations of many affected companies. Standardizing sustainability reporting aims to enhance transparency, improve investor decision-making, and encourage sustainable business practices.

Adapting to these new reporting requirements may pose challenges for companies, necessitating new data collection and reporting systems. Tools like Onventis Analytics can help companies understand and comply with these new standards. The ESRS and CSRD are dynamic and may evolve based on feedback and emerging sustainability challenges. Effective implementation requires engagement with various stakeholders, including investors, customers, and regulators.

The CSRD and ESRS are integral to the EU's broader strategy for climate change mitigation and sustainable development. The EU offers guidance documents and resources to assist companies in navigating the CSRD and ESRS requirements. See:

- Commission Delegated Regulation on ESRS here
- Draft EFRAG IG 1: Materiality assessment implementation guidance here
- Draft EFRAG IG 2: Value chain implementation guidance here
- Draft EFRAG IG 3: Detailed ESRS datapoints implementation guidance here and accompanying explanatory note here.

1.2. Who and when to report according to the CSRD?

The **Corporate Sustainability Reporting Directive (CSRD)** establishes clear timelines for companies to comply with sustainability reporting, depending on their size and classification. Here's a breakdown:

1. Large Companies & Parent Companies of Large Groups

- **Applicability**: Companies with over 500 employees (previously subject to the Non-Financial Reporting Directive, NFRD).
- **Timeline**:
    - Financial years starting on or after **1 January 2024**.
    - **First report**: Due in **2025**, covering the **2024 financial year**.

2. Other Large Companies

- **Applicability**: Companies meeting at least two of these criteria:
    - Over 250 employees.
    - €50 million in turnover.
    - €25 million in total assets.
- **Timeline**:
    - Financial years starting on or after **1 January 2025**.
    - **First report**: Due in **2026**, covering the **2025 financial year**.

3. SMEs, Small Credit Institutions, and Captive Insurers

- **Applicability**:
    - Listed small and medium-sized enterprises (SMEs).
    - Small and non-complex credit institutions.
    - Captive insurance undertakings.
- **Timeline**:
    - Financial years starting on or after **1 January 2026**.
    - **First report**: Due in **2027**, covering the **2026 financial year**.

4. Non-EU Companies with Significant EU Activity

- **Applicability**: Companies with:

- Net turnover exceeding €150 million in the EU.
- A subsidiary or branch in the EU meeting specific thresholds.

- **Timeline**:
  - Financial years starting on or after **1 January 2028**.
  - **First report**: Due in **2029**, covering the **2028 financial year**.

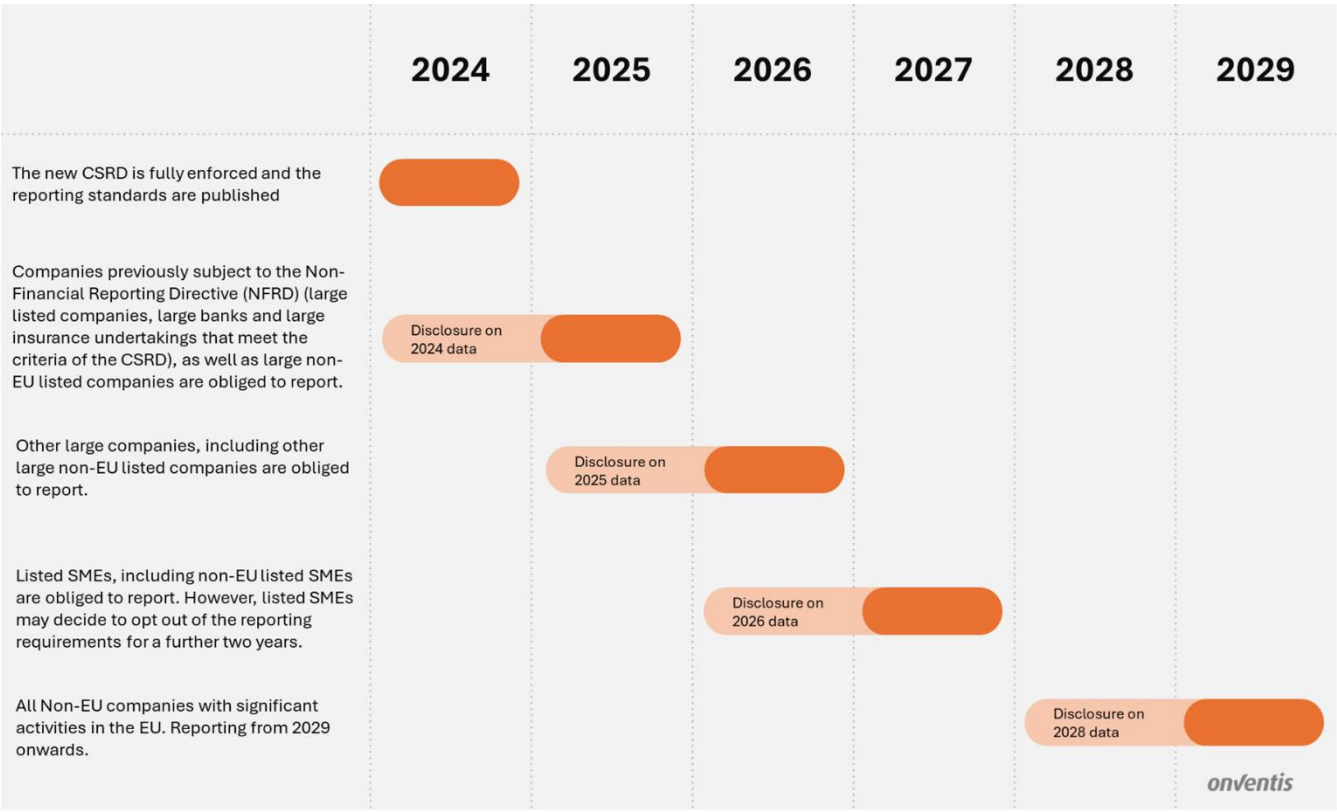

Figure 1: Timeline for CSRD Reporting

1.3. What to disclose According to CSRD/ ESRS?

The **European Sustainability Reporting Standards (ESRS)**, implemented in January 2024 under the **Corporate Sustainability Reporting Directive (CSRD)**, provide a unified framework for ESG (environmental, social, and governance) reporting across Europe. This initiative aims to enhance the rigor and transparency of non-financial reporting, aligning it with financial reporting standards, and embedding sustainability into business practices.

Key Features of the ESRS:

1. **Foundation and Alignment**:
   - Developed by EFRAG, adopted by the European Commission (July 2023).
   - Aligns with global standards like TCFD, GRI, and IFRS Sustainability Disclosure standards.
   - Supports EU legal frameworks such as the EU Green New Deal and Sustainable Finance Framework.

2. **Double Materiality**:
    - Requires companies to report both:
        - **Impact Materiality**: How their activities affect society and the environment.
        - **Financial Materiality**: How sustainability issues impact their business.

3. **Framework Structure**:
    - **Mandatory Cross-Cutting Standards**:
        - ESRS 1 outlines important concepts and principles which must be followed when reporting under the CSRD
        - ESRS 2 offers reporting requirements which must be followed under the topical standards, which all companies must report on, regardless of sector
    - **Topical Standards**: Ten optional standards for detailed ESG topics.
    - **Sector-Specific Standards**: Tailored standards for industries, expected by 2026.

1.3.1. ESRS E1

The two overall standards ESRS 1 (General Requirements) and ESRS 2 (General Disclosures) contain the general principles and disclosures that must be considered when preparing sustainability reports. ESRS 1 describes the general requirements for the content of sustainability reporting, while ESRS 2 provides information on which specific disclosure requirements apply to the respective companies, regardless of their sector and for all sustainability topics.

ESRS E1 is a key European sustainability reporting standard under the broader ESRS framework, designed to guide companies in reporting on climate change impacts as required by the Corporate Sustainability Reporting Directive (CSRD).

Think of sustainability reporting as constructing a house: the CSRD sets the rules for construction, the ESRS provides the blueprint, and ESRS E1 represents the kitchen—a critical, detailed part that demands careful planning.. ESRS E1 addresses climate change, covering adaptation, mitigation, and energy aspects. It aligns with EU legislation, emphasizing climate change effects over short, medium, and long terms.

Climate change touches nearly every business and sector, making ESRS E1 essential in sustainability reporting. Its standardization enables comparability across industries, offering stakeholders transparent, actionable insights.

Double Materiality Principle
Under CSRD's double materiality approach, ESRS E1 is likely material for most companies. It highlights how businesses impact climate change (through emissions) and how climate-related risks and opportunities affect financial performance. This dual perspective drives more comprehensive reporting.

Why It Matters
ESRS E1 promotes comparability, increasing transparency across the EU and beyond. By providing a unified framework, it fosters meaningful climate action and equips investors and stakeholders with valuable decision-making data.

Beyond Compliance
Effective ESRS E1 reporting can help companies better manage climate risks, identify opportunities, and contribute to global climate goals. Though the standard might appear complex initially, a structured approach simplifies compliance.

ESRS E1's Nine Subcategories

1. E1-1: Transition Plan for Climate Change Mitigation
    - Outline your strategy to reduce emissions and align with the Paris Agreement. Include time-bound targets and key actions.
    - Report key actions, targets, and resources allocated.
    - *Example*: Commit to a 50% reduction in scope 2 emissions by 2030 through renewable energy investments.
2. E1-2: Policies on Climate Change Mitigation and Adaptation
    - Detail formal policies addressing emissions reduction (mitigation) and climate risk preparation (adaptation).
    - Include realistic, actionable steps.
    - *Example*: Prioritize low-carbon suppliers or climate-proof facilities.
3. E1-3: Actions and Resources for Climate Change Policies
    - Explain concrete steps and resources allocated for climate policy implementation.
    - *Example*: Invest in energy-efficient equipment or train employees on sustainability practices.
4. E1-4: Targets for Climate Change Mitigation and Adaptation
    - Set measurable sustainability goals with defined timelines.
    - They should address the most significant contributors to a company's climate impact.
    - Companies must set quantitative, time-bound GHG reduction targets for Scopes 1, 2, and 3, aligned with frameworks like Science-Based Targets (SBTs). These targets should specify baseline years, target years, and reduction percentages, focusing on material activities and significant emissions sources, including upstream and downstream Scope 3 categories.
    - Interim milestones are essential for tracking progress, with regular reporting and adjustments as needed. Targets must align with climate scenarios limiting global warming to 1.5°C or well below 2°C. Companies must also disclose how targets

integrate with their strategy, business model, and financial planning, alongside methodologies and data sources used.

- *Example*: Source 100% renewable electricity by 2026.

5. E1-5: Energy Consumption and Mix
    - Report total energy use and source types, highlighting efficiency and clean energy progress.
    - *Example*: Use 60% renewable and 40% non-renewable energy, with plans to increase renewables.
6. **E1-6: Gross Scopes 1, 2, 3, and Total GHG Emissions**
    - Disclose emissions across scopes 1, 2, and 3, with breakdowns by source and intensity.
    - *Example*: Include emissions from factories (scope 1), purchased energy (scope 2), and suppliers (scope 3).
7. E1-7: GHG Removals and Carbon Credits
    - Disclose carbon removal activities and financed mitigation projects.
    - *Example*: Invest in biochar projects that remove 300 tons of CO2.
8. E1-8: Internal Carbon Pricing
    - Report internal carbon pricing systems and how they guide business decisions.
    - *Example*: Use a €140/tonne CO2e price for project evaluations.
9. E1-9: Anticipated Financial Effects of Climate Risks and Opportunities
    - Describe expected financial impacts of climate risks and opportunities.
    - *Example*: Disclose costs for flood protection and revenue from low-carbon products.

	Retrospective				Milestones and target years			
	Base year	Compa-rative	N	% N / N-1	2025	2030	(2050)	Annual % target / Base year
Scope 1 GHG emissions								
Gross Scope 1 GHG emissions (tCO_2eq)								
Percentage of Scope 1 GHG emissions from regulated emission trading schemes (%)								
Scope 2 GHG emissions								
Gross location-based Scope 2 GHG emissions (tCO_2eq)								
Gross market-based Scope 2 GHG emissions (tCO_2eq)								
Significant scope 3 GHG emissions*								
Total Gross indirect (Scope 3) GHG emissions (tCO_2eq)								
Purchased goods and services								
[Optional sub-category: Cloud computing and data centre services								
Capital goods]								
Fuel and energy-related activities								
Upstream leased assets								
Waste generated in operations								
Processing of sold products								
Use of sold products								
End-of-life treatment of sold products								
Downstream leased assets								
Franchises								
Upstream transportation and distribution								
Downstream transportation and distribution								
Business travels								
Employee commuting								
Financial investments								
Total GHG emissions								
Total GHG emissions (location-based) (tCO_2eq)								
Total GHG emissions (market-based) (tCO_2eq)								

Figure 2: Disclosure Requirements ESRS E1-6 (Source: https://www.efrag.org/sites/default/files/sites/webpublishing/SiteAssets/08%20Draft%20ESRS%20E1%20Climate%20Change%20November%202022.pdf p.35)

1.3.2. ESRS E2

ESRS 2 focuses on delivering comprehensive sustainability-related disclosures, emphasizing materiality assessment, governance integration, data accuracy, and alignment with global standards. The key aspects of the standard include:

Comprehensive Scope: ESRS 2 covers a wide range of sustainability topics, including the scope of sustainability statements, value chain coverage, and the adoption of external sustainability reporting standards.

Materiality Assessment: Companies must identify and evaluate the material impacts, risks, and opportunities related to sustainability, ensuring these assessments drive their reporting.

Governance and Strategy Integration: The standard underscores the importance of embedding sustainability into corporate governance structures and strategic decision-making.

Data Accuracy and Transparency: Organizations are required to disclose key metrics, such as value chain data, alongside details on assumptions and measurement uncertainties.
This approach ensures that sustainability reporting is both thorough and aligned with internationally recognized standards.

Further readings on ESRS 2:
https://www.efrag.org/sites/default/files/sites/webpublishing/SiteAssets/07.%20Draft%20ESRS%202%20General%20disclsoures%20November%202022.pdf

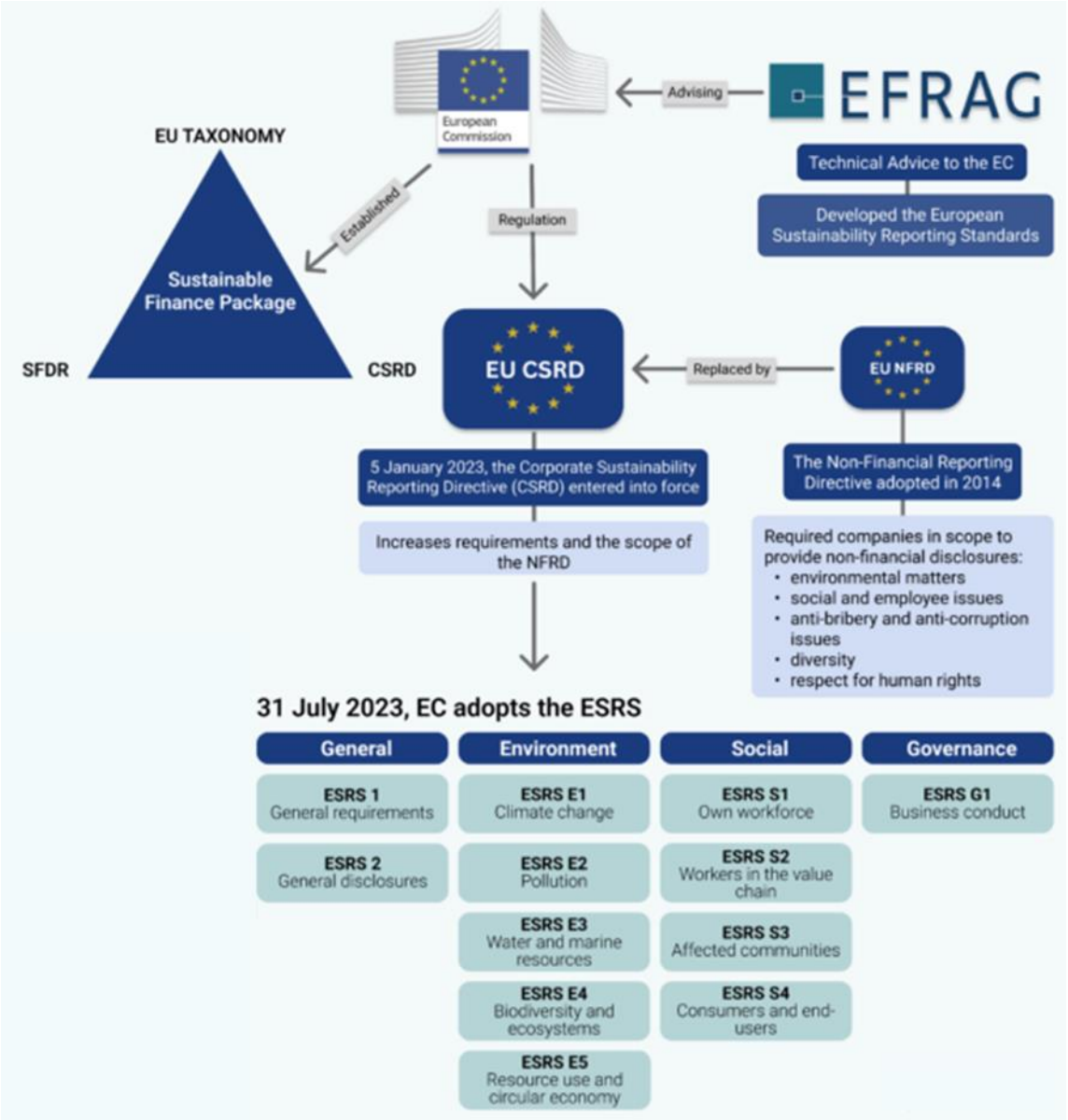

Figure 3: Summary Regulation Landscape

1.4. How to calculate Emissions for ESRS E1-6

1.4.1. What are the GHG Scopes and Boundaries?

Calculating your company's carbon footprint is essential for understanding and addressing the greenhouse gas (GHG) emissions generated directly and indirectly by your operations. These emissions, expressed as tons of CO2 equivalent (CO2e), are categorized into:

- **Scope 1:** Direct emissions from sources owned or controlled by the company, such as the combustion of fossil fuels or emissions from company vehicles.
- **Scope 2:** Indirect emissions resulting from the consumption of purchased electricity, steam, or other energy sources.

- **Scope 3:** Indirect emissions across the entire value chain, from raw material extraction to product disposal, including activities from suppliers, distributors, and end customers.

The conversation around corporate responsibility and carbon accountability has intensified, with Scope 3 emissions taking center stage. Businesses, policymakers, and environmentalists are diving deep into what Scope 3 emissions entail and why addressing them is crucial. In this guide, we'll break down Scope 3 emissions, their categories, how to measure and reduce them.

While Scope 1 and Scope 2 focus on a company's direct actions, **Scope 3 emissions** represent the most significant part of a company's carbon footprint. As a result, supply chain emissions have become a focal point in decarbonization efforts.

To accelerate the transition to a net-zero economy and effectively mitigate global emissions, businesses must focus on decarbonizing their entire supply chain. **Scope 3 emissions** encapsulate a company's entire value chain and are a crucial element in any comprehensive carbon footprint analysis.

These emissions stem from sources not owned or directly controlled by the company but are tied to its activities—such as business travel, employee commuting, and third-party distribution. According to the GHG Protocol Standard, Scope 3 emissions are categorized into 15 distinct groups.

Measuring these emissions provides companies with a broader perspective on their environmental impact, offering actionable insights into the complex network of operations, relationships, and practices that define their business.

1.4.2. What are the 15 emissions categories of Scope 3?

The GHG Protocol divides Scope 3 emissions into two primary categories: **upstream** and **downstream** activities. This classification helps businesses identify high-impact areas in their value chains and design effective mitigation strategies.

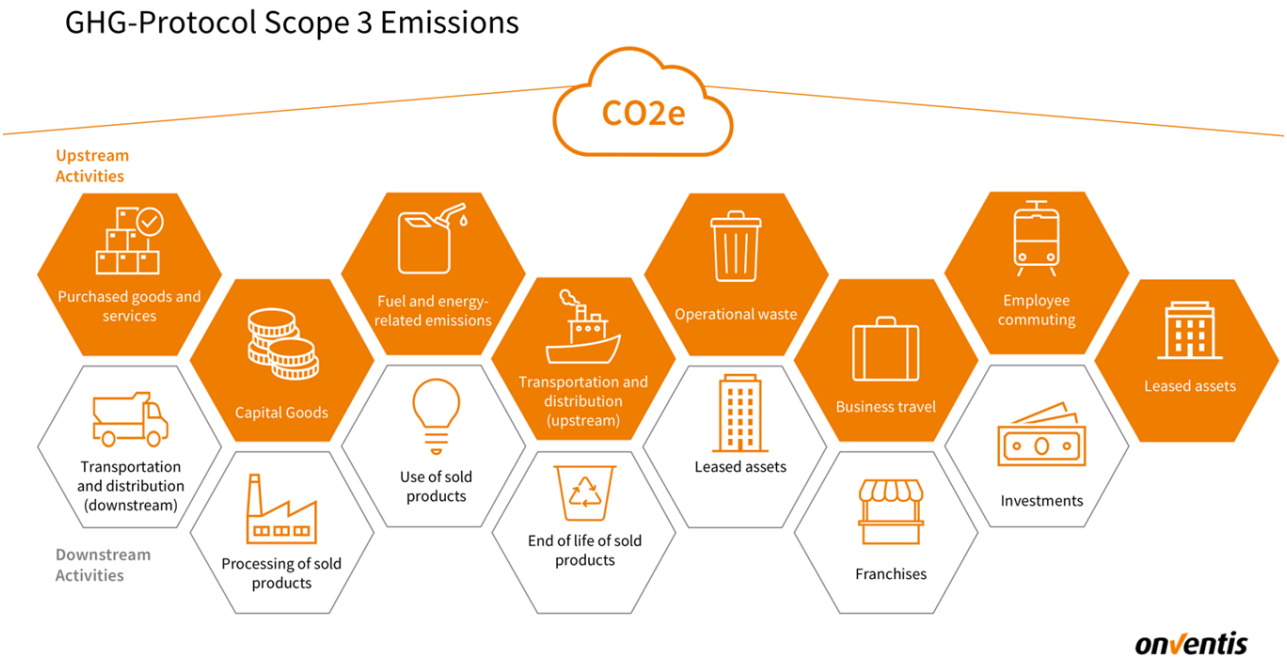

Figure 4: Scope 3 GHG Emission Categories

Upstream Activities

1. **Purchased Goods and Services**
   Emissions from the extraction, production, and transportation of goods and services a company buys. This includes the making and moving of products and services the company acquires.
2. **Capital Goods**
   Emissions from the extraction, production, and transportation of capital goods purchased or acquired by the company, such as machinery and large equipment.
3. **Fuel and Energy-Related Activities**
   Emissions from producing and transporting fuels used by the company, producing the electricity purchased by the company, and power loss during electricity transmission.
4. **Upstream Transportation and Distribution**
   Emissions from moving goods between the company and its suppliers, covering the transportation and distribution of products within the supply chain.
5. **Waste Generated in Operations**
   Emissions from handling and disposing of the company's operational waste, such as waste sent to landfills and wastewater treatments. These processes release methane (CH4) and nitrous oxide (N2O), which are more potent than CO2.
6. **Business Travel**
   Emissions from employee travel for work using non-company vehicles, such as planes, trains, and cars.
7. **Employee Commuting**
   Emissions from employees' daily commutes between their homes and workplaces.
8. **Upstream Leased Assets**
   Emissions from using leased assets that are not owned or directly controlled by the company.

Downstream Activities

9. **Downstream Transportation and Distribution**
   Emissions from moving and storing products sold by the company, including journeys to the end consumer and storage in non-company facilities or vehicles.
10. **Processing of Sold Products**
    Emissions from the transformation or processing of the company's sold intermediate products before their final use.
11. **Use of Sold Products**
    Emissions from the use of the company's products by consumers.
12. **End-of-Life Treatment of Sold Products**
    Emissions from the disposal or recycling of products sold by the company, including emissions released during waste treatment.
13. **Downstream Leased Assets**
    Emissions from assets leased out by the company, including their operation and usage.
14. **Franchises**
    Emissions from operations at franchised outlets operating under the company's brand but not directly managed by the company.
15. **Investments**
    Emissions related to the company's financial investments in other businesses or projects, including equity, debt investments, and project finance.

1.4.3. Why Do Scope 3 Emissions Matter?

Scope 3 emissions represent the bulk of a company's carbon footprint, often accounting for up to 90% of total greenhouse gas (GHG) emissions. These emissions provide a full-spectrum view of a business's climate impact, covering every aspect of its value chain.

Recent studies show supply chain emissions are, on average, 11.4 times higher than operational emissions, largely due to improved supplier reporting methods. Tackling these emissions requires robust collaboration across the supply chain. The risks are not just environmental but also economic, with potential financial impacts on suppliers estimated at $1.26 trillion over the next five years. If passed on to corporate buyers, this could add $120 billion in costs.

While adherence to the GHG Protocol has improved transparency, action—especially within supplier networks—remains insufficient. Companies must lead by example, fostering initiatives that inspire environmental progress throughout their value chains.

Here's why measuring **Scope 3 emissions** is integral:

1. **Holistic Environmental Understanding:** It provides a complete view of a company's environmental impact, including all upstream and downstream activities.
2. **Identification of Emission Hotspots:** Pinpoints the most significant emission sources within the value chain, allowing for targeted intervention.
3. **Risk and Opportunity Assessment:** Helps businesses foresee potential risks and identify opportunities for low-carbon products, cost savings, and operational efficiencies.
4. **Enhanced Transparency and Credibility:** Publicly reporting on Scope 3 emissions builds credibility with stakeholders and demonstrates genuine sustainability efforts.

5. **Engaging Value Chain Partners:** Enables companies to engage suppliers and partners in collaborative efforts to reduce emissions and improve sustainability practices.
6. **Strategic Alignment:** Supports the achievement of corporate sustainability targets and strengthens business strategies by identifying and managing GHG reduction opportunities.

In essence, measuring **Scope 3 emissions** is not just an environmental responsibility—it is a business necessity that drives effective decarbonization, enhances reputation, and supports long-term success in a sustainability-driven economy.

1.4.4. How to set and achieve decarbonisation Targets for Scope 3 Emissions

Reducing Scope 3 emissions is a critical challenge for businesses aiming to lower their carbon footprint and contribute to global climate goals. This requires setting ambitious decarbonisation targets and implementing targeted reduction strategies across the value chain.

1. Map and Measure Scope 3 Emissions

Start by identifying the main sources of Scope 3 emissions in your value chain, including upstream activities (e.g., raw material sourcing, transportation) and downstream activities (e.g., product use, disposal). Collect accurate data using life cycle assessments (LCAs), supplier surveys, and third-party databases. Where direct measurements aren't feasible, estimate emissions based on industry averages or proxies. Understanding these emissions hotspots is essential for prioritizing reduction efforts.

2. Set Science-Based Targets

Align your decarbonisation goals with global climate objectives by using frameworks like the Science-Based Targets Initiative (SBTi). These targets should focus on areas with the highest emissions and aim to limit global warming to 1.5°C. Science-based targets provide a clear pathway to meaningful emissions reductions and demonstrate credibility to stakeholders.

3. Engage Suppliers and Partners

Because a significant portion of Scope 3 emissions arises from suppliers, collaboration is key. Work with them to:

- Share emissions data and reduction strategies.
- Co-create sustainability programs.
- Set shared emissions reduction goals.
  Incorporate emissions-related expectations into contracts and provide resources to help suppliers transition to low-carbon practices.

4. Implement Scope 3 Reduction Strategies

Focus on practical and targeted measures to reduce Scope 3 emissions:

- **Business Model Innovation**: Shift to models like leasing or product-as-a-service, which extend product lifespans and reduce resource consumption.
- **Sustainable Procurement**: Source from low-carbon suppliers, prioritize sustainable materials, and integrate carbon criteria into procurement decisions.

- **Product Design**: Develop products that are energy-efficient, durable, and recyclable to lower emissions across their lifecycle.
- **Customer Engagement**: Promote sustainable product use and recycling to influence emissions tied to product use and disposal.
- **Operational Adjustments**: Reduce emissions from activities such as business travel, logistics, and waste management by adopting policies like remote work or optimized transportation.

5. Monitor, Report, and Refine Progress

Regularly track your progress toward Scope 3 targets. Use transparent reporting to share results with stakeholders and adjust strategies as needed based on new insights or developments within your value chain.

By focusing on mapping emissions, engaging suppliers, and implementing targeted reduction strategies, companies can make meaningful progress in reducing Scope 3 emissions and advancing global decarbonisation goals.

Sources:

https://www.efrag.org/sites/default/files/sites/webpublishing/SiteAssets/08%20Draft%20ESRS%20E1%20Climate%20Change%20November%202022.pdf

https://www.umweltbundesamt.de/umweltberichterstattung-csr-richtlinie

https://finance.ec.europa.eu/news/commission-adopts-european-sustainability-reporting-standards-2023-07-31_en

https://ghgprotocol.org/sites/default/files/standards/Scope3_Calculation_Guidance_0.pdf

https://sciencebasedtargets.org/resources/files/SBT_Value_Chain_Report-1.pdf

https://www.efrag.org/sites/default/files/sites/webpublishing/SiteAssets/08%20Draft%20ESRS%20E1%20Climate%20Change%20November%202022.pdf

1.5. How Onventis Analytics can help in sustainability reporting

As sustainability becomes a strategic priority for businesses, meeting reporting obligations like the Corporate Sustainability Reporting Directive (CSRD) is more critical than ever. One of the biggest challenges? Accurately quantifying Scope 3 greenhouse gas (GHG) emissions.
That's why we're thrilled to introduce a powerful new feature in our Onventis Analytics solution: Scope 3 emissions analysis turning spend into CO2 emissions.

With this enhancement, procurement teams can now effortlessly calculate and share data on indirect emissions from purchased goods and services. The data is ready-made for sustainability departments, bridging the gap between procurement and sustainability teams by providing accurate, structured emissions data based on spend categories. This streamlines a company's CSRD reporting efforts and ensures compliance with evolving regulations.

Our automated platform simplifies data consolidation across your organization, with CO2 emission calculations tailored for Scope 3 reporting under CSRD.
With detailed footprints and integrated emission reduction planning, our platform empowers you to turn insights into impactful action.

Here is how our solution can support in ESRS E1 Reporting:

1. Transition Plan for Climate Change Mitigation (E1-1)

- Spend-based CO2e Calculation: Helps calculate emissions based on spend data, which is critical for assessing how the company's purchasing decisions align with its transition plan.
- Setting of Emission Targets per Category or Supplier: Enables companies to set and track specific climate goals for categories or suppliers, supporting long-term mitigation efforts.
- 2-Level Emission Factor Retrieval and Emission Calculation: Calculates emissions based on default or supplier-specific factors, helping track progress against targets.

2. Policies Related to Climate Change Mitigation and Adaptation (E1-2)

- Mapping Customer Categories and Emission Categories: Allows for accurate mapping between customer categories and emission categories (e.g., Swedish Government, Exiobase), supporting policy alignment across various sectors.
- Manual and AI Suggestions for Mapping: Helps identify and apply the correct policies related to mitigation and adaptation for climate change, ensuring consistency with the company's strategies.
- AI Assistance: Provides AI-driven recommendations to improve emission reduction which can be translated into actionable policies.

3. Actions and Resources in Relation to Climate Change Policies (E1-3)

- Create Special Eco Categories: Helps define energy sources and categories (e.g., renewable energy like wind and solar) to track the effectiveness of mitigation actions.
- AI Assistance: Provides AI-driven recommendations and strategies to improve emission reduction
- Mapping to 15 GHG Protocol Categories: Helps structure emissions data in line with global GHG standards to ensure actions and resources are properly categorized and reported.

4. Targets Related to Climate Change Mitigation and Adaptation (E1-4)

- Setting of Emission Targets per Category or Supplier: Directly enables the establishment of specific, measurable climate targets tailored to categories or suppliers.
- Analysis:
    - Emission Dashboard with Key Insights: Helps track the company's progress toward emission targets, enabling ongoing monitoring.
    - Comparability of Emissions vs. Targets in Analysis: Allows users to compare actual emissions with set targets, improving transparency and accountability.

5. Energy Consumption and Mix (E1-5)

- Create Special Eco Categories: Allows differentiation of energy sources (e.g., solar vs. wind) for more accurate reporting on energy consumption and mix.
- Mapping Customer Categories and Emission Categories: Helps identify the energy sources and corresponding emissions factors for each category, providing a clear picture of energy use.

6. Gross Scope 3 GHG Emissions (E1-6)

- Spend-based CO2e Calculation: Facilitates the calculation of emissions for Scope 3 (indirect emissions from the supply chain), improving the comprehensiveness of emissions reporting.
- Access to reliable emission factors: Out of the box access to credited spend-based Emission Factors (Factors from Swedish Government and Exiobase for global coverage)
- Option to set own emission factors on category and supplier: Ensures accurate emissions data by using the best available emission factors (supplier-specific factors when possible).
- Mapping to 15 GHG Protocol Categories: Structures emissions data in a format required for GHG reporting, ensuring compliance with ESRS E1's scope breakdown.

2. Calculate your Emissions with Onventis Analytics

Carbon accounting fundamentally revolves around measuring the emissions produced by your company's operations. This process entails gathering data on various business activities and using scientifically established emission factors to translate that data into CO_2 equivalent (CO_2e) emissions. The result is a clear numerical representation of your carbon footprint.

This activity data can be could be The amount of electricity consumed in the office (measured in kWh), the amount of petrol burned in company cars (measured in litres), the distance travelled by train for business trips (measured in kilometres). However in our solution we now focus only on spend as the activity unit.

The key advantage of a spend-based assessment lies in its practicality. While activity-based emission estimates are generally more accurate, gathering and cleaning the necessary data for them is often a complex and time-consuming process. This difficulty means many companies are unable to adopt an activity-based approach, making the spend-based method an effective alternative.

At Onventis Analytics, we appreciate the spend-based approach for several reasons:

1. Companies are typically structured around cost and value. Departments such as accounting or procurement have a clear understanding of the goods or services purchased and the associated expenditure throughout their supply chains.
2. When this data is combined with spend-based emission factors, it offers a solid first approximation of a company's Scope 3 carbon footprint.
3. Spend-based emission factors are easy to apply. They provide an average emissions value per unit of currency based on broad modeling. This model looks at the total money spent within a particular sector, the overall emissions generated by that sector, and the effects of trade within the economic region involved.

With this in mind, the spend-based approach can be an effective way to measure emissions, provided the methodology behind it is carefully considered and properly implemented.

Let's explore how spend-based emission factors work in greater detail and examine ways to mitigate the limitations of this approach.

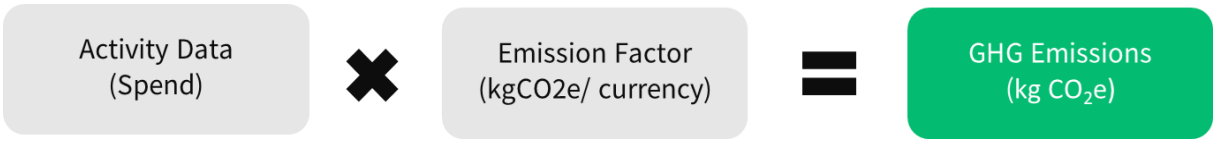

Figure 5: Spend-based methodology

2.1. The Spend-Based Method for identifying Emission Hotspots

The GHG Protocol Scope 3 Standard recommends using the average industry spend-based method when other methods (such as supplier-specific activity-based, average industry activity-based, or hybrid methods) are not feasible. This method allows companies to get an initial view or benchmark of their emissions, particularly for Scope 3, which can otherwise be challenging to assess. However,

it is important to recognize the limitations of the spend-based approach, including issues with granularity, price volatility, and supply-demand specificity. Companies should aim to transition towards a full activity-based inventory, especially for activities where action plans are needed. Using spend-based emission factors, emissions can only be reduced by decreasing expenditures. For changing emission intensity, supplier-specific or activity-based methods should be employed. Typically, companies start with a spend-based method for an initial overview and then apply more granular approaches as necessary. A combination of activity-based and spend-based methods can be used, as not all activities require the same level of detail.

Spend-Based Emission Factors and EEIO Models

- Spend-based emission factors primarily rely on Environmentally Extended Input-Output (EEIO) models, which provide a specific method for estimating the environmental impacts, particularly greenhouse gas emissions, associated with economic activities. Here's a detailed explanation:

- Input-Output Analysis: This quantitative economic technique maps the flow of goods and services within an economy, showing how the output of one industry becomes the input of another. The IO model aggregates high-level expenditures annually, regionally, and by sector, assuming uniform pricing across industries. Although actual prices may vary, this discrepancy is generally minimized over time and across diverse transactions.

- Environmentally Extended Input-Output (EEIO) Models: These models enhance traditional input-output analysis by incorporating environmental data, tracking both the flow of economic goods and services and their environmental impacts, such as resource use and emissions.

- Spend-Based Emission Factors: Within EEIO models, these factors quantify the emissions (like CO2, methane, etc.) associated with a specific amount of spending in a particular sector or on a specific product or service. They account for emissions across the entire supply chain.
    - For instance, a spend-based emission factor for the automotive sector would include emissions from car manufacturing as well as from producing the steel, plastic, and other materials used in cars, and services like advertising and legal support.

Swedish National Agency for Public Procurement

The environmental spending analysis is based on life cycle analysis, LCA, more precisely a so-called accounting LCA. An accounting LCA examines what the actual environmental load, which can be linked geographically and temporally to a good, service or contract, is during its life cycle. Here, the environmental impact of the product or service is tracked and recorded by following the value chain. As the analysis is a purchasing analysis, they have set the system limits so that they include goods, services and contracts from the "cradle" to the buyer's gate (or "gate").

For a more detailed explanation of the approach and dataset, see here: https://www.upphandlingsmyndigheten.se/om-hallbar-upphandling/miljomassigt-hallbar-upphandling/analysera-inkopen-med-miljospendanalys/miljospend--metod-och-material/

Exiobase for Global Coverage
Exiobase is a detailed global Multi-Regional Environmentally Extended Input-Output Table model (EEIO) with spend-based emission factors for 163 industries and 200 products across 49 regions. The factors are derived by allocating national GHG emissions to groups of finished products based on economic flows between industry sectors. Although comprehensive, Exiobase's level of granularity is relatively low. The factors were downloaded from here: https://zenodo.org/records/5589597

Onventis Analytics has licensed the cradle-to-gate Exiobase's Scope 1,2,3 emission factor dataset. The Scope 1,2,3 emission factor dataset means a spreadsheet file of greenhouse gas emission factors prepared for scope 1, 2 and 3 as defined by the GHG Protocol https://ghgprotocol.org to point of production of goods and services with outliers removed. The Licensed Data uses the EXIOBASE dataset (for information https://exiobase.eu/) and emission factors and are prepared for the 200 products and 49 regions of the EXIOBASE dataset for the year 2020 based on version 3.9 of EXIOBASE.

2.2. Integrated Data Sources

For each indirect measurement, a company must quantify GHG emissions by multiplying activity data by an emission factor. Companies must provide a description of the types and sources of activity data and emission factors used in their calculations. They are required to use the best available and most recent emission factors for their application. (Source: GHGP Corporate Value Chain Standard, p. 68 and p. 119)

Onventis Analytics is not a publisher of emission factors itself, but makes existing emission factor datasets available through its platform.

Onventis Analytics has implemented emission factors in 3 distinct ways:

- Integrated: emission factor database is mapped to our data model and can be used as "default" set of emission factors (e.g., Swedish Gov.)
    - These factors are not editable by the customer
    - The dataset is not downloadable for the customer
- Custom: user can always define own emission factors on category and supplier level
    - These factors are editable by the customer
    - Custom factors always have priority over the integrated emission factors
    - **The unit of these factors is money, so we are only using at the spend-based approach and NOT activity-based approach based on quantity units e.g. kg, kilowatt, hours etc.**

The following emission factor databases are available as "integrated dataset" (see next chapter):

- Swedish Government (Miljöspendanalys) LCA from the year 2021
    - Available for all customers
- Exiobase (version 3.9 from the year 2020)
    - Available as an add-on

Integrated emission factor databases are updated whenever a new update is released by the emission factor publisher.

The custom emission factors can be put on categories and suppliers, in case the customer has this detailed data. These custom factors have priority over the integrated datasets for calculating the emissions. More on the selection of the emission factors, see the next chapter.

2.3. Selection of Emission factors

In order to retrieve the best emission factor for a spend line, Onventis Analytics follows a predefined process, which is described below.

2.2.1. Characteristics of an Emission factor

Each emission factors is of the attribute type “Amount” which means they are always connected to a **currency.** The currency for an emission factor is an own attribute and can be maintained in an own column called “CO2 emission factor currency”.

Emission factors are calculated based on *one* currency - let's call that the source currency. This could be kg of CO2e emitted based on every USD spent. This means that this emission factor considers what emissions are generated by one dollar of money spent in a certain year e.g. 2018. If you use this with another currency, such as EUR, Onventis Analytics will automatically use the applicable exchange rate from 2018 between EUR and USD, to determine what the correct USD amount is.

Further, each emission factor has a **valid from** date. If a custom factor is added without a valid from date, then we still use this factor until a new emission factor is created. If there a multiple factors are stored, we take the factor that was effective, at the time the invoice or the order was created.

If no factor can be found throughout our retrieval logic due to missing currency and or matching information, a transaction is marked with “no factor found” and can be filtered for to apply further actions. More on this in chapter 2.2.4.

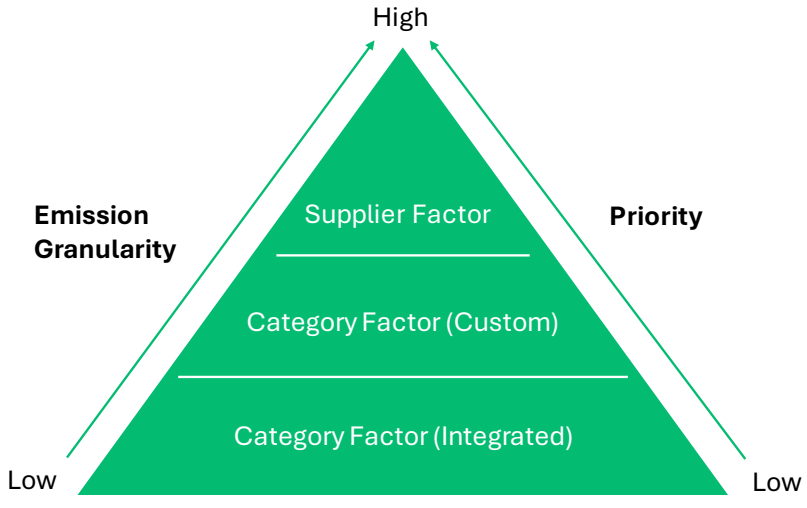

Figure 6: Hierarchy of Emission Factor Selection

2.2.2. Supplier Emission Factor

Given the supplier has a custom factor stored, this factor is applied with the highest priority. An emission factor on supplier level is chosen, based on these parameters: The supplier name, the defined “valid from” date of the factor and the currency.

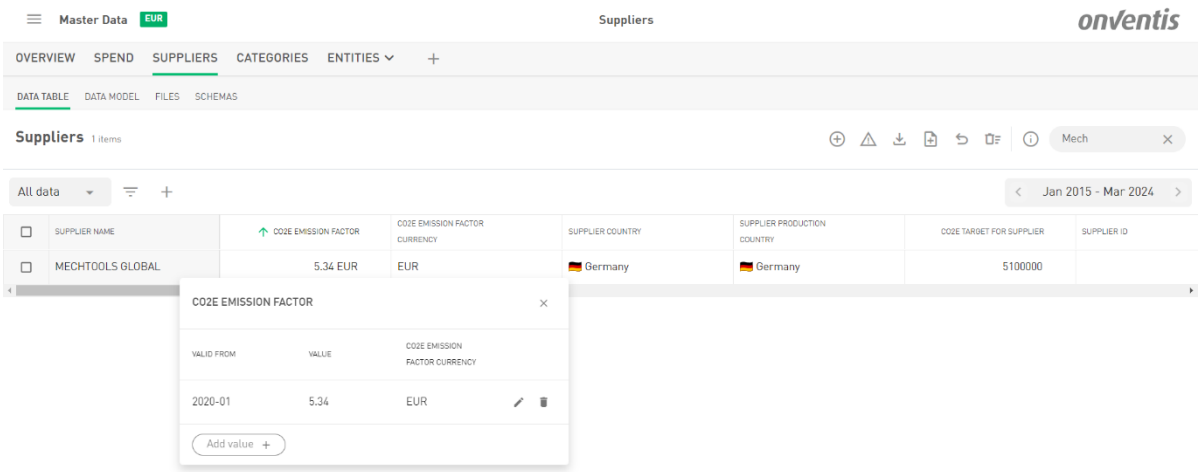

Figure 7: Supplier Emission Factor

A supplier emission factor could be calculated as follows: Spend by Supplier x (Total Emissions of that Supplier/ Total Revenue of that Supplier). This requires and enquiry to the supplier about the supplier’s total emissions and revenue.

A supplier emission factor can be calculated using the following formula:

$$Supplier\ Emission\ Factor\ =\ Spend\ by\ Supplier \times \left(\frac{Total\ Revenue\ of\ that\ Supplier}{Total\ Emissions\ of\ that\ Supplier}\right)$$

This calculation requires an inquiry to the supplier to obtain information about the supplier's total emissions and total revenue. The inquiry is not part of Onventis Analytics, but could be done using the Supplier Management Module of Onventis Buyer.

2.2.3. Category Emission Factor (Custom)

If no supplier factor is found we check if a custom factor is stored on the category level. A custom that was manually entered by the customer gets priority over our integrated datasets. An emission factor on category level is chosen, based on three parameters: The category name and the defined “valid from” date of the factor and the currency.

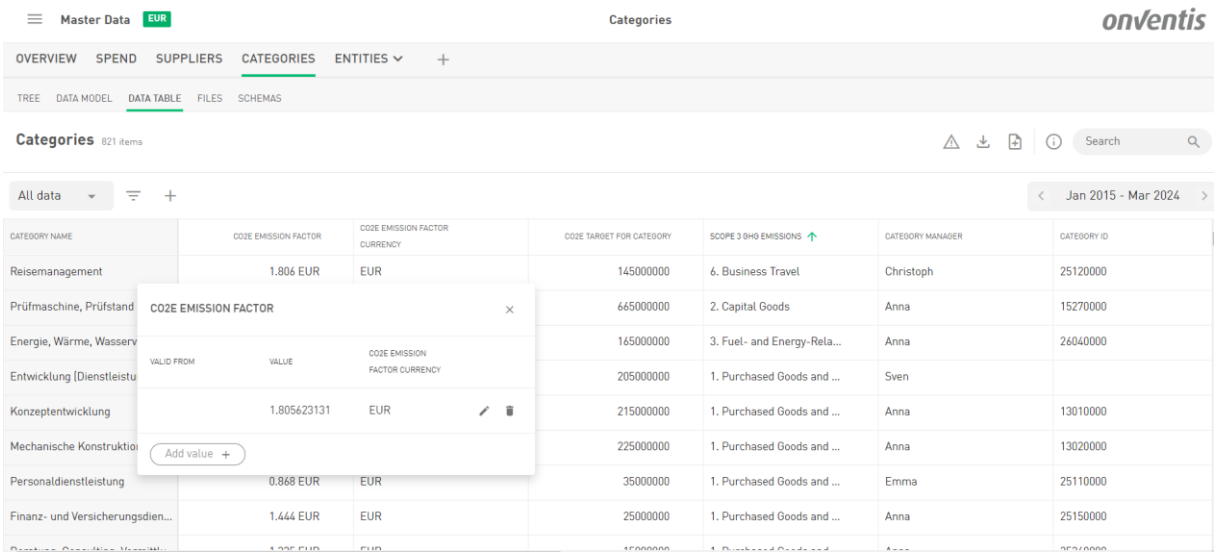

Figure 8: Setting up own emission factors

Important Note:

If a child category is missing an custom emission factor BUT the parent has an custom emission factor stored, then this parent factor will also be applied to all child categories that don't have an own custom emission factor.

More precisely, if a leaf category lacks a custom emission factor but its parent has one, the parent's custom factor will take precedence—even if the leaf category is linked to an integrated emission category and could otherwise use a factor from our integrated data sources.

To ensure that the emission factor from our integrated data sources is used instead in this case, avoid assigning custom factors to parent categories.

2.2.4. Category Emission Factor (Integrated)

In case a customer has **not** stored a custom supplier or category factor, our integrated emission factors, described in chapter 2.2. come into effect.

Similar to the category emission factor (custom) described in the previous chapter, the correct emission factor is calculated based on three parameters: Year of Spend Creation, Country of Spend Supplier and the Mapping between the Customer Categories and the Emission Categories from our default data sources, see chapter 3.3. Access emission factors. Thereby the emission factor on the lowest category level (leaf category) has the highest priority and will be used for emission calculation. If no emission factor on leaf level can be found, then the parent factor will be used.

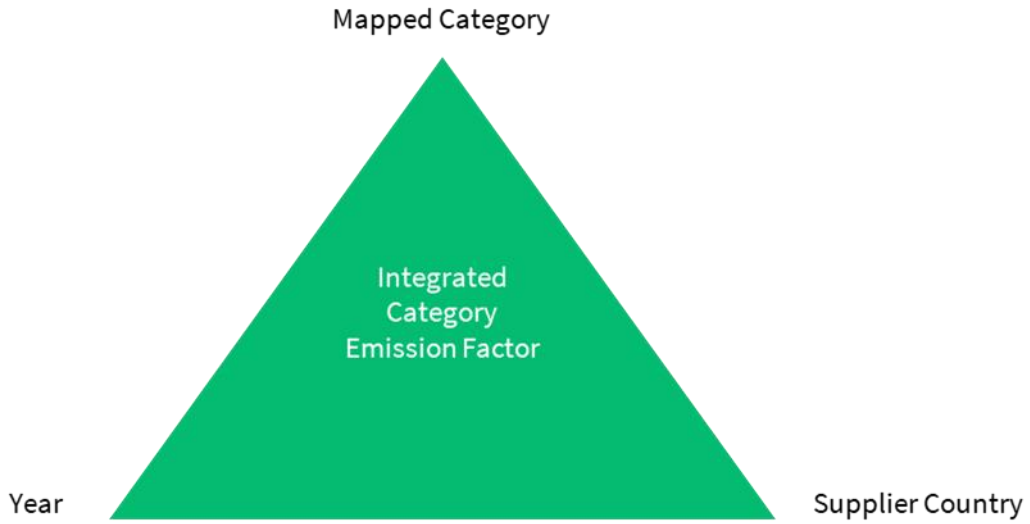

Figure 9: Parameter for Selection of Integrated Category Emission Factor

The supplier's country is the primary factor used to determine where emissions are generated. This information is crucial for accurately calculating emissions. Therefore, we strongly recommend that customers store and maintain up-to-date country information for all their suppliers.

In Onventis Analytics, the selection of the country for emission calculation follows a defined priority to ensure accuracy. The process is as follows:

1. **Invoice Supplier Country from Spend File (Invoice or Order):** The actual country that is found on the invoice.
2. **Supplier's Production Country**: The supplier's production country refers to the location of the supplier's manufacturing sites where the purchased goods and services are produced
3. **Supplier's Country:** If the supplier's production country is unknown, please provide the supplier's country instead. This represents the location of the supplier, such as their headquarters.

In case a customer is only using the dataset provided by the Swedish government, then the emission factors are used independent of the supplier country. When also the Exiobase dataset is licensed, the found supplier country plays a special role for emission calculation, as it also determines which data source comes into effect. **Assuming that every of the customer's category are mapped to a Swedish and an Exiobase category**, the country is selected as follows:

1. Exiobase dataset is **not** licensed:
    - Only Swedish dataset is used for emission calculations regardless of the supplier country
2. Exiobase dataset is licensed:
    - Swedish Country: If the retrieved supplier (production) country is Sweden, the emission factors provided by the Swedish Government are applied.
    - Non-Swedish Country: If the retrieved country is not Sweden and the Exiobase dataset is licensed, the emission factors from the respective country within the Exiobase database are used.

This method ensures that the most appropriate and accurate emission factors from an integrated dataset are applied based on the year, category name, and country. Please refer to the next chapter for a more comprehensive understanding of these integrated datasets.

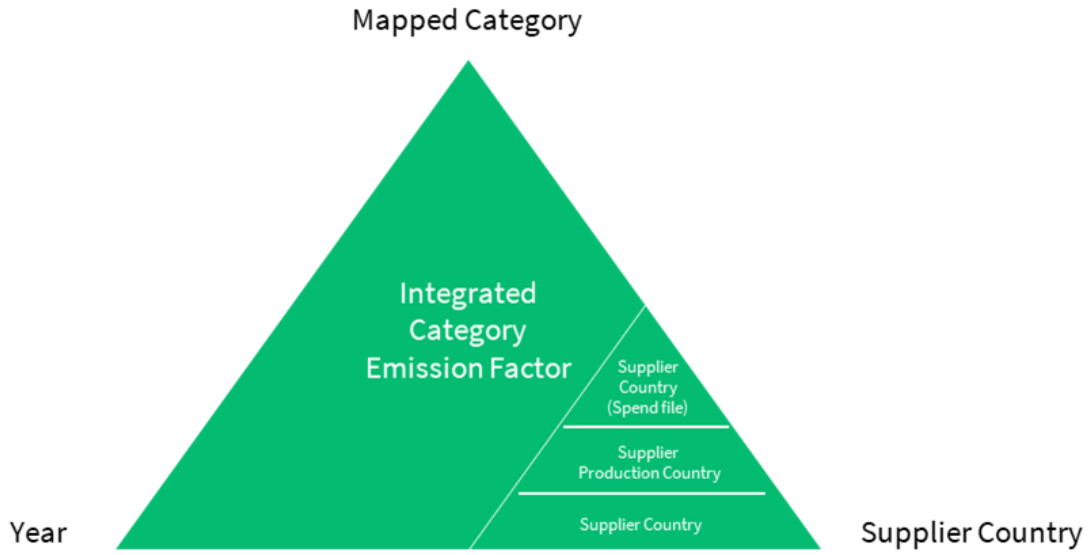

Figure 10: Hierarchy of Supplier Countries for Selection of Integrated Category Emission Factor

2.2.5. No Emission Factor Found

On the emissions dashboard or by doing analysis with the default attribute “Emission factor found” you can check, how much of your spend is covered by an emission factor and how often no factor was found

There are multiple reasons why no factor was found:

1. Custom Factors (on Category or Supplier) does not have a currency
2. No country was put on the supplier production and or supplier country attribute
3. Invoice/ Order date is before the valid from date of custom factors
4. No mapping between customer categories and Swedish emission categories
5. No mapping between customer categories and Exiobase categories

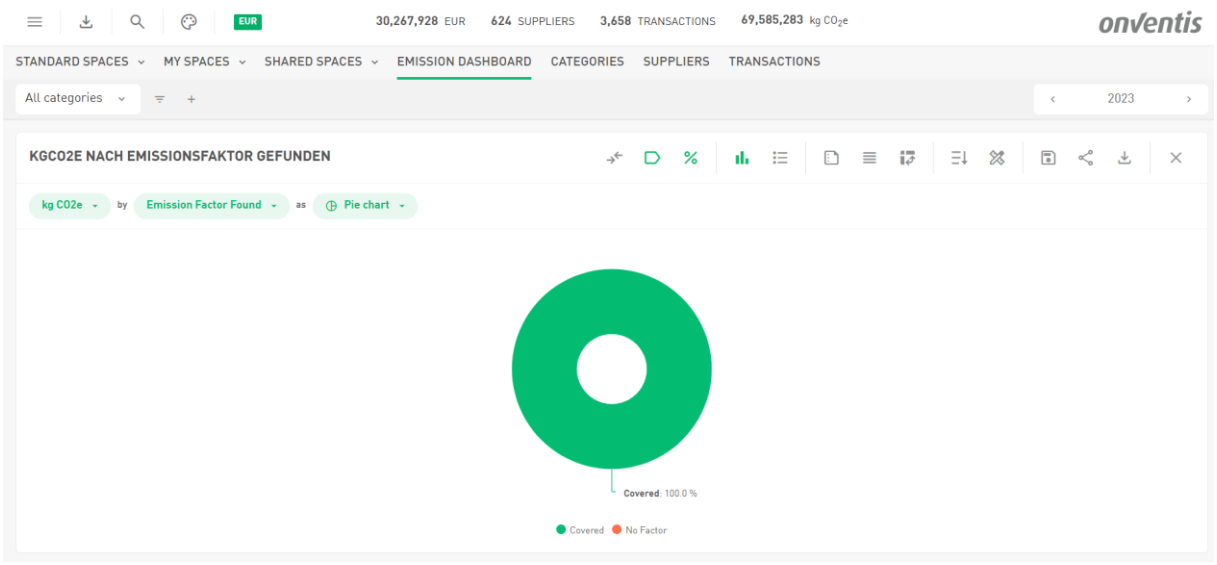

Figure 11: Overview on how much spend is converted into emissions

3. How-To set up EcoSpend in Onventis Analytics

3.1. Access right management

For Onventis Analytics standalone customers, no new permissions were introduced for this feature. All existing permissions work as before. Additionally, every Admin and Category Admin have access to the Emission cockpit, making it possible to manage emissions.

Description	Ad-min	Upload admin	Category admin	Pur-chaser	Viewer
Manage User permissions (Add or delete users, change user rights)	x				
Change the Configuration of the system (duplicates, financial year etc)	x				
Manage everything in the Master Data part of the system	x				
Import spend files	x	x			
Update existing objects in the Master Data	x	x	x		
Upload files to enrich data in the Master Data	x	x	x		
Categorize spend (incl configuration of category tree)	x		x		
Manage Agreement data	x		x		
Can contact Onventis Analytics's support	x		x	x	
Download data to Excel	x		x	x	
Use Onventis Analytics Pivot charts	x		x	x	
Deep dive analysis (change information on axis in charts etc)	x		x	x	
Apply filters when analyzing	x		x	x	
Search for Suppliers in the Analyze part	x		x	x	
Create Personal or Shared Dashboards	x		x	x	
Analyze using standard charts and already existing Dashboards	x		x	x	x
Export charts to various picture formats	x		x	x	x
Change individual language and currency	x		x	x	X
ECOspend Feature					
Manage Emission Cockpit (including Emission category mapping)	x		x		
Manage own emission factors and targets on supplier and category level	x		x		

Figure 12: Permissions Onventis Analytics (standalone)

For Onventis Analytics integrated into Onventis Buyer, one additional access right was introduced called “Eco Feature”. Every user with that access right, gets access to the Emission cockpit and can manage the emission mapping.

Figure 13: Eco Feature Access right (Onventis Buyer)

3.2. Getting started

On our Emissions Page, you'll find a detailed step-by-step guide to get good and accurate emission calculations. Each step can be marked as complete once it's finished. Let's dive into the individual steps!

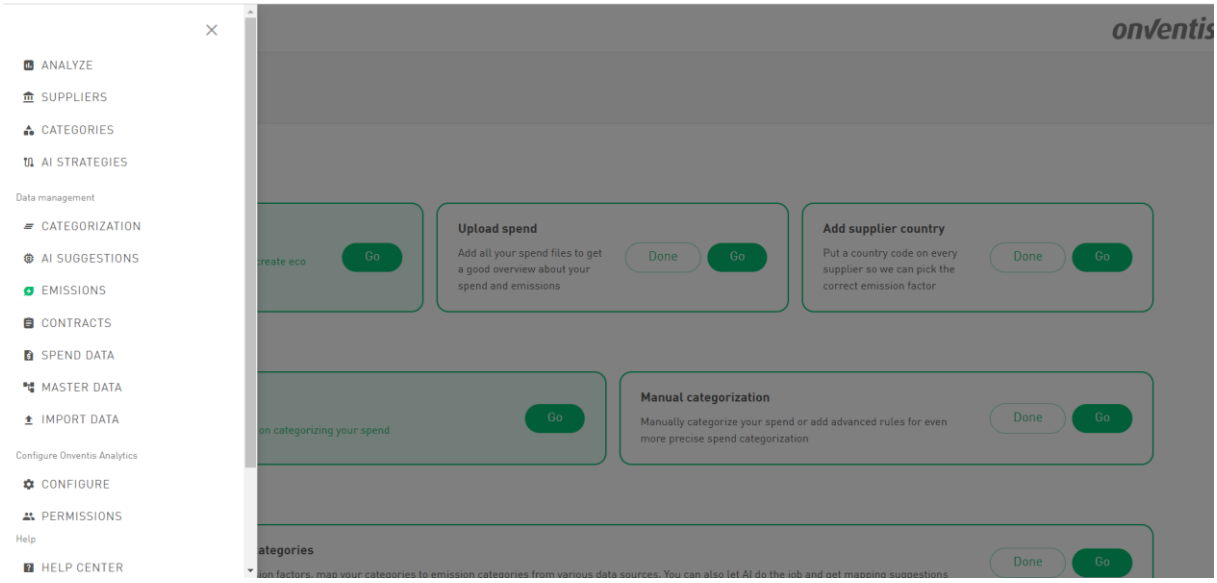

Figure 14: New Menu Item "Emissions"

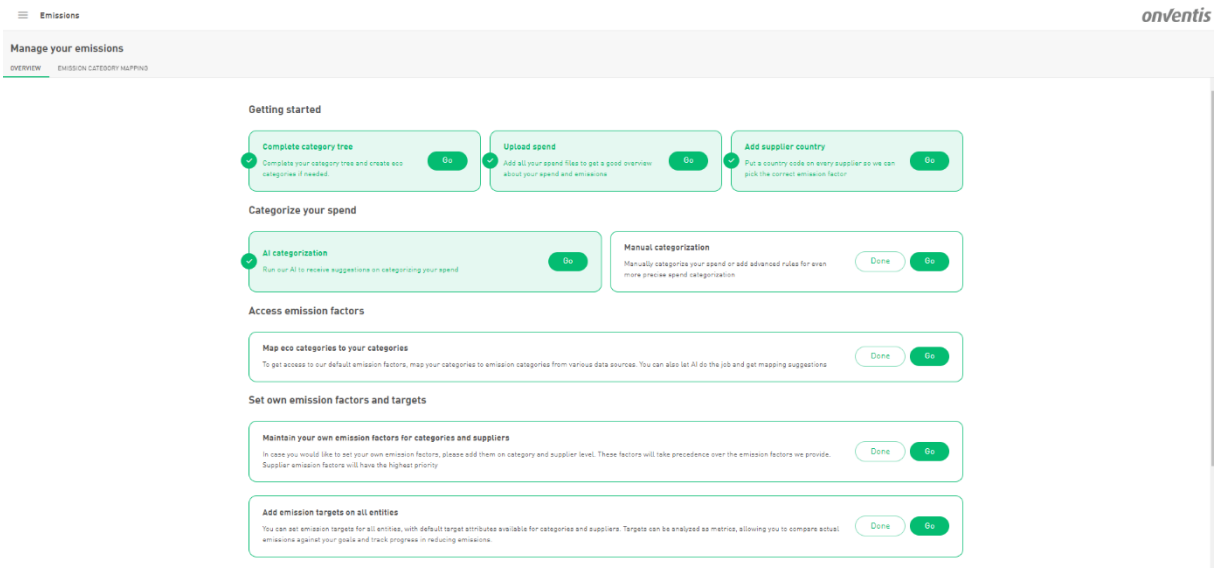

Figure 15: Steps for proper Emission Analysis

3.2.1. Complete category tree

Complete your spend category tree to include all categories you want to analyze. You can also create dedicated eco-categories specifically for emission analysis. For example, breaking down 'Transportation' into "Electric Vehicles," "Hybrid Vehicles", "Rail Transport," "Air Freight" etc., may not be crucial for spend analysis but can provide more precise—and often lower—emission factors, ultimately reducing your reported emissions.

Further examples could be:

- "Paper Products" divided into eco-categories like "Recycled Paper," "Sustainably Sourced Paper," "Standard Paper".
- "Packaging" divided into the eco categories "Recyclable Packaging," "Compostable Materials," "Plastic Packaging".

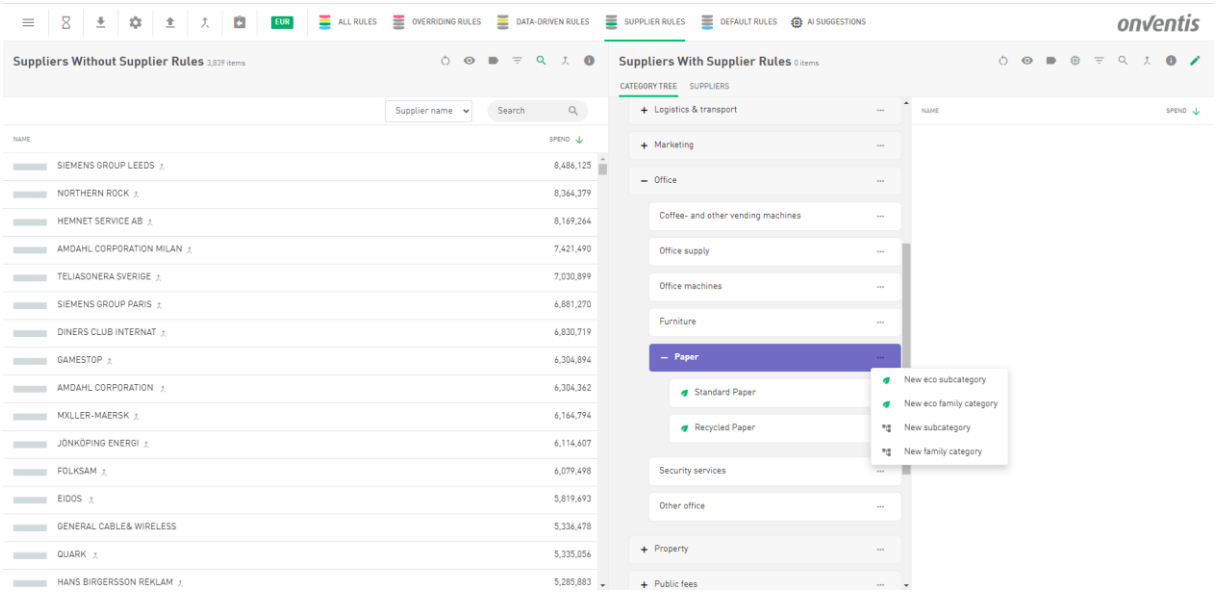

Figure 16: Creation of new Eco Categories

3.2.2. Upload Spend

Add all relevant invoices or purchase order spend files to ensure all of your spend is converted into emissions. This will provide a comprehensive overview of your spend and emissions.

3.2.3. Add supplier (production) country

From the uploaded spend file we are reading your suppliers and create them in the system. You can either manually enrich your supplier with a supplier (production) country or via an enrichment file. Putting a country on every supplier is crucial because only with a country we can retrieve pick the most accurate emission factor from our data sources.

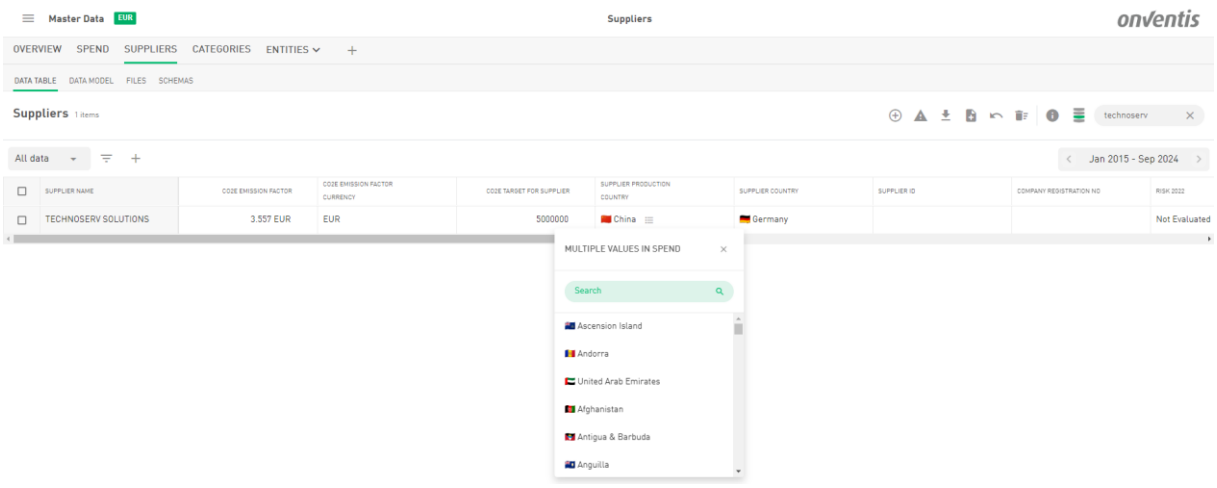

Figure 17: Adding supplier (production) country as tag value

3.3. Categorize spend

3.3.1. AI categorization

Use our AI categorization to categorize as much spend as possible. Only categorized spend can be used for emission calculations. Run our AI to receive suggestions how to categorize your spend based on your supplier and GL account name.

3.3.2. Manual categorization

On top of AI categorization you can add more advanced rules on for even more precise spend categorization. Of course, you don't need to use AI categorization and set up your own categorization rules manually.

Please note, that you will only get emissions calculated for special eco categories, if you categorize your spend into these categories.

3.4. Access emission factors

To utilize our integrated emission factors, such as EXIOBASE, you'll need to map the emission categories from each dataset to your category tree. Alternatively, you can let AI handle this task by leveraging the mapping suggestions our AI generates nightly, which also include any newly added categories.

3.4.1. Emission Mapping Overview

On the Emission Mapping page, you'll find the emission categories from various sources displayed on the left.

Each data source is highlighted in a distinct color, making it easy to differentiate mappings at a glance. AI-generated suggestions initially appear in the color of their respective data source. Once accepted or manually overridden, they turn green, allowing you to quickly identify the categories that still need mapping. Additionally, the column title includes a number indicating how many categories remain to be mapped.

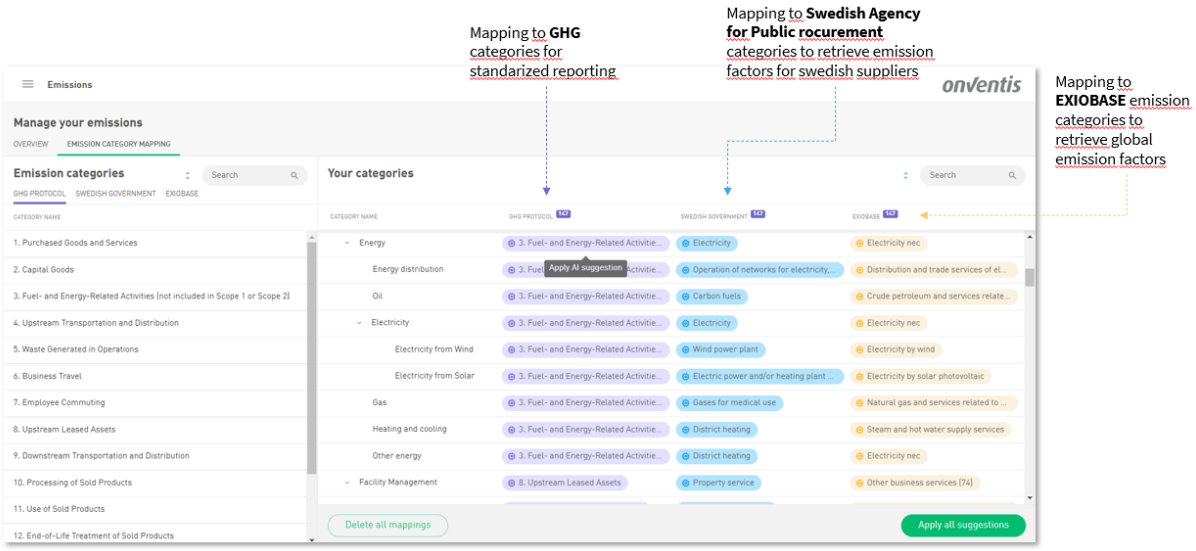

Figure 18: Accept Mapping Suggestion

3.4.2. Map emission categories to your categories

To accept an AI mapping, simply click the colored pill. To remove a mapping, click the pill again to delete it, and the AI suggestion will reappear. For convenience, you can bulk accept all suggestions by clicking the "Apply All Suggestions" button at the bottom. If you prefer to start fresh, click "Delete All Mappings" to remove all existing mappings and return to the initial state, where AI suggestions are displayed for all your categories.

You can also map categories by simply dragging and dropping. Just drag a category from the left side and drop it onto your category on the right. The mapping will automatically align with the correct column, and the category will turn green to indicate it's successfully mapped.

Thereby the mapping on the lowest category level (leaf category) has the highest priority for emission factor retrieval unless there is a custom factor (see chapter 2.3).

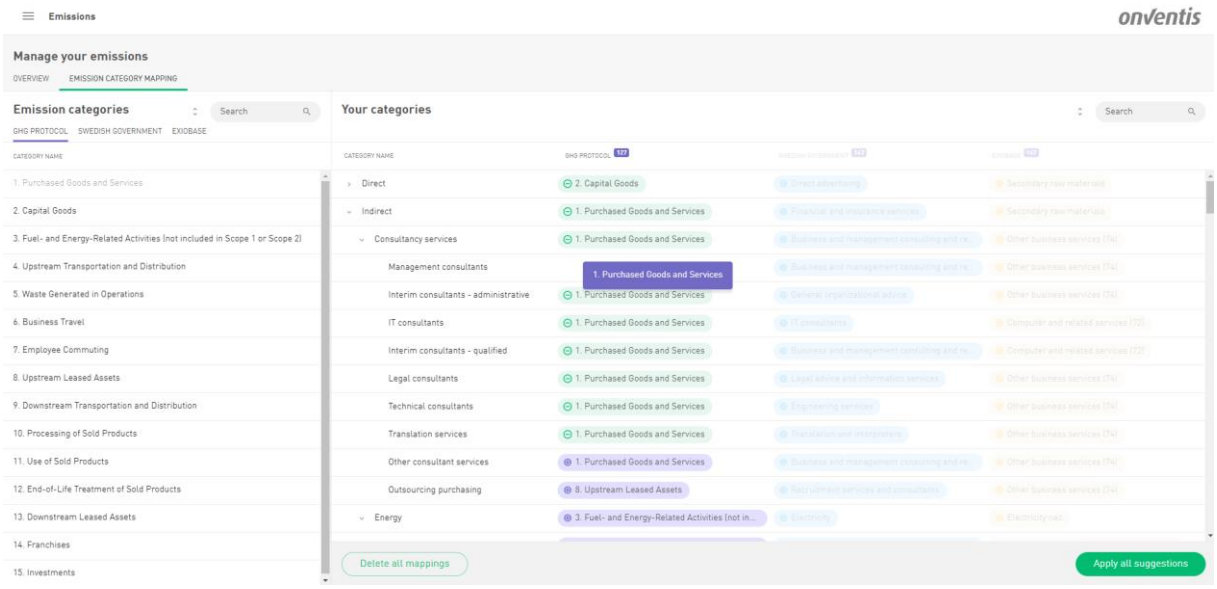

Figure 19: Manually map emission categories

GHG Protocol (Purple)

Mappings for the GHG Protocol are a bit special. These are not used to obtain an emission factor but are necessary for creating accurate emission reports. For the ESRS E1 report, all emissions must be reported in a standardized format using the 15 GHG protocol categories.

Swedish Government (Blue)

Each of your categories must be mapped to one of the 590 categories defined by the Swedish Government.

EXIOBASE (Yellow)

Each of your categories must be mapped to one of the 200 categories provided by EXIOBASE.

3.5. Add custom emission factors

If you want to use your own emission factors, you can add them at the category and supplier levels. These custom factors will override the integrated emission factors we provide, with supplier-level factors having the highest priority. Please ensure that every custom emission factor is specified, including its associated currency. For more information, see chapter 2.3. Selection of Emission factors.

3.6. Set Emission Targets

You can set emission targets for all entities, with default target attributes available for **categories called** “CO2 Target for Category” and **suppliers** called “CO2 Target for Supplier”. Targets can be analyzed as metrics, allowing you to compare actual emissions against your goals and track progress in reducing emissions.

Targets are of the attribute type “integer,” meaning they are whole numbers without decimal places. Each target should be created separately for each year you wish to measure, such as a target attribute for 2025, 2026, and so on. Please note that the unit of measurement for targets is $kgCO_2e$.

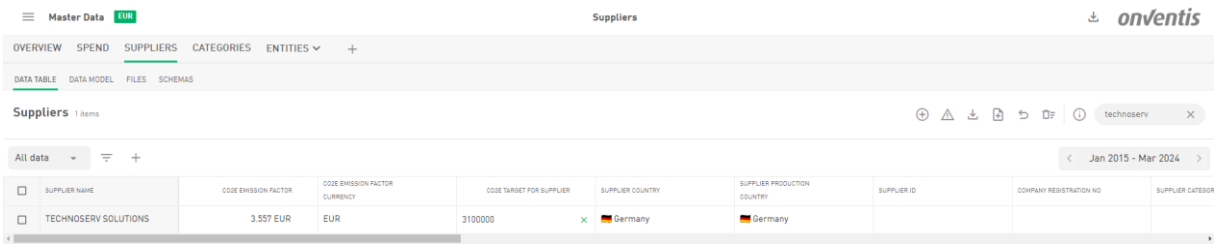

Figure 20: Emission Target Setting on Supplier

3.7. Analyze Emissions

Gain valuable insights into your emissions with our out-of-the-box emissions dashboard, featuring comprehensive and visually engaging charts. After completing the setup process outlined above, you’ll have instant access to key emissions data through our preconfigured dashboard. Here’s what you can explore on the Emission Analysis Dashboard:

- **KG CO_2 Equivalent by Category:** The sunburst charts for emissions by category offer a dynamic, multi-level visualization that displays emissions across all levels of the category tree in a circular format. Each segment of the chart represents a category, with larger segments indicating higher emissions. This intuitive design allows users to quickly identify which categories contribute the most to emissions and to explore the hierarchical structure of emissions data in greater detail.
- **Spend vs. KG CO2E by Leaf Category**: Analyze the correlation between your expenditure and emissions within detailed categories.
- **KG CO2E by Supplier Country:** A world map that visualization displays the amount of emissions by country. With a single click, users can drill down into specific regions, such as the Nordics, Baltics, DACH, and Benelux, to explore emissions in greater detail.
- **KG CO2E and Spend by Leaf category:** Scatter plot that visualizes emissions in relation to leaf category spend, making it easy to identify categories with disproportionately high emissions compared to their spend.
- **KG CO2E vs. Target by Leaf Category**: Track progress by comparing your current emissions with your predefined reduction targets for each category.
- **KG CO2E by Supplier**: Identify high-emission suppliers and prioritize engagement for sustainability improvements with those suppliers.
- **KG CO2E by Leaf Category and Year:** This visualization highlights the trend for categories with the highest emissions over the past three years, allowing users to track how emissions by category have evolved over time. Helps to identify long-term patterns or improvements.
- **KG CO2E and Spend by Supplier:** Scatter plot that visualizes emissions in relation to supplier spend, making it easy to identify suppliers with disproportionately high emissions compared to their spend.
- **KG CO2E vs. Target by Supplier**: Assess how individual suppliers are performing against your emissions reduction goals.
- **KG CO2E by Supplier and Year**: This visualization highlights the trend for suppliers with the highest emissions over the past three years, allowing users to track how emissions by category have evolved over time. Helps to identify long-term patterns or improvements.

With these insights at your fingertips, you'll be well-equipped to identify key emission drivers, monitor progress toward sustainability goals, and make data-driven decisions to reduce your carbon footprint.

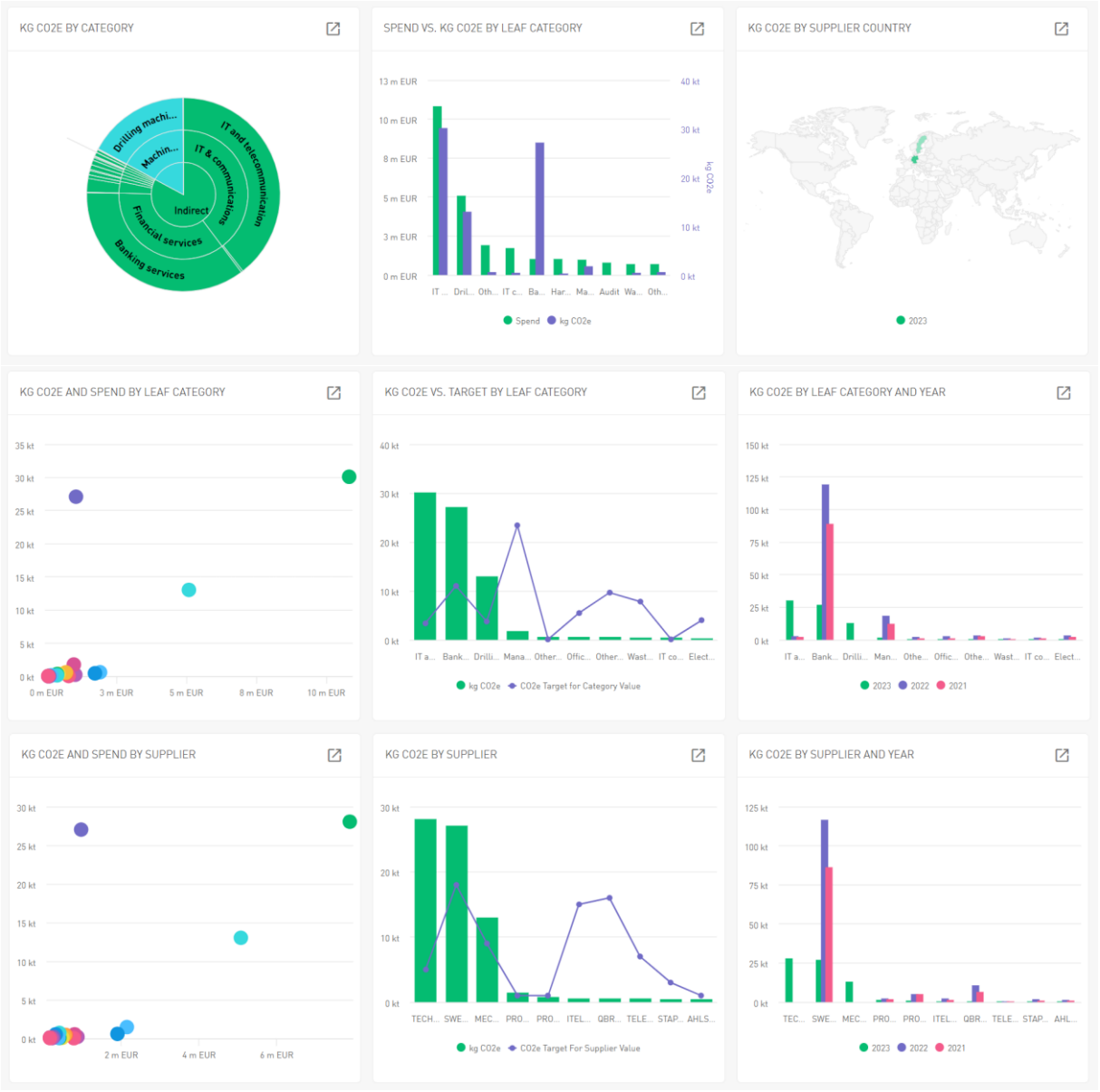

Figure 21: Emission Analysis Dashboard

As with all other spaces, you have the flexibility to customize the charts, dive deeper into the data, and share insights with others—such as the sustainability officer in your company. This allows for tailored collaboration and ensures that the right stakeholders have access to the information they need.

Your emissions analysis is not confined to this default space. You can create your own spaces tailored to your unique needs, combining all relevant data for a holistic analysis. This capability empowers you to explore your emissions from every angle, ensuring comprehensive insights and effective decision-making for your sustainability strategy.

3.7. Report Emissions

Besides the Emission Analysis Dashboard we also provide a default Emission Reporting Dashboard. This dashboard provides valuable information on the source and the coverage of the emission calculations. Further, if the mapping to the GHG Scope 3 categories to the own category tree was

done, emissions can be analyzed and reported in the structure, required for CSRD Reporting (see Chapter 1.3. What to Disclose According to CSRD/ ESRS)

Here's what you can explore on the Emission Reporting Dashboard:

- **KG CO_2 Equivalent by Scope 3 GHG Emissions**: Understand the distribution of emissions across different Scope 3 categories.
- **KG CO_2 Equivalent Coverage**: Measure the completeness of your emissions data by comparing the availability of emission factors for your spend.
- **KG CO_2 Equivalent by Emission Factor Source:** Provides insights on where the emission factors for calculation of emissions were retrieved: Category, Supplier, Exiobase or Swedish government.
- **KG CO_2 Equivalent Breakdown:** A comprehensive Pivot Table that provides a detailed breakdown of emission calculations by year. It highlights the categories covered with a factor, those without one, and the sources of the factors used. This helps users clearly understand how the emissions were calculated and identify any gaps that need to be addressed.

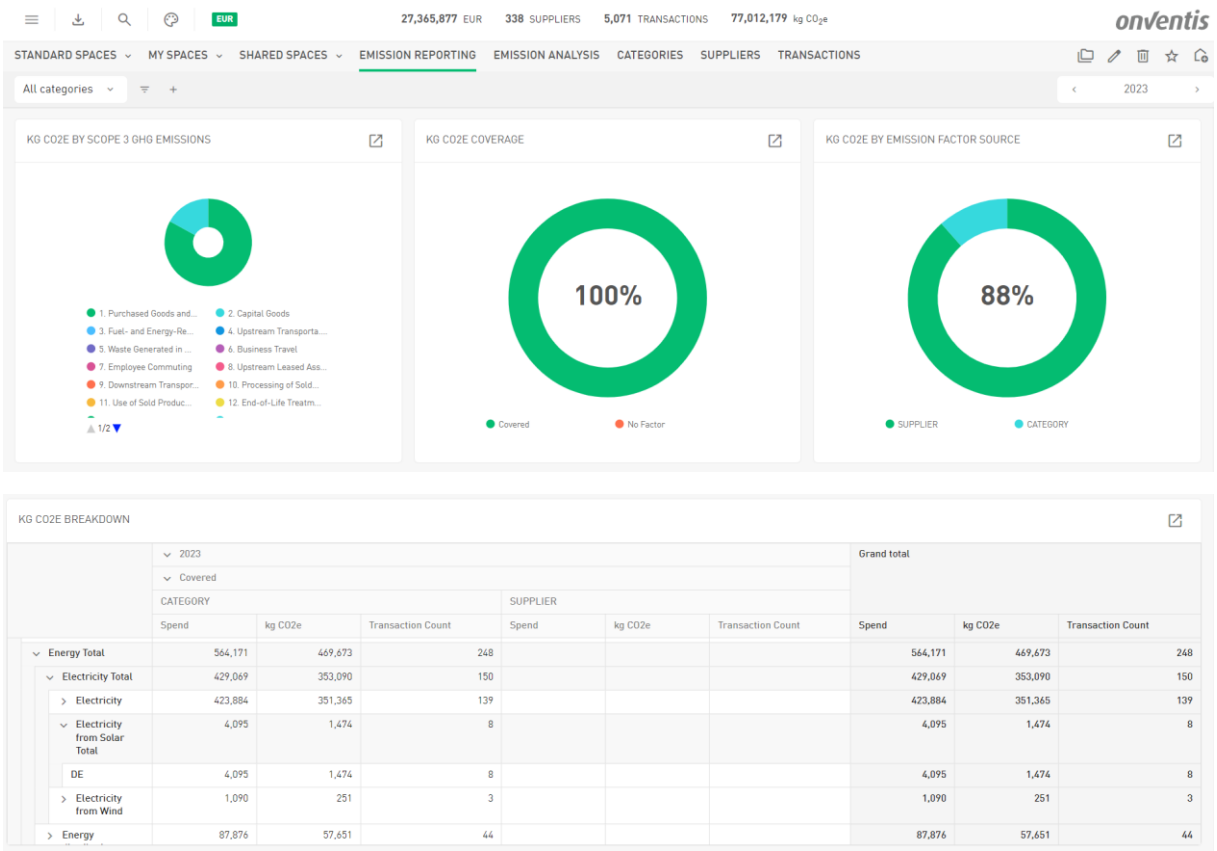

Figure 22: Emission Reporting Dashboard