

GP.Bullhound

MARCH 2024



Carbon accounting software

Counting what matters



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The view

FROM GP BULLHOUND

To achieve the ambitious global goal of net zero by 2050, human-caused CO₂ emissions must decrease by approximately 43% from 2019 levels by 2030. The transition to decarbonising our economy is complex and, in the buzz of it all, it remains inevitable that we are entering a new era of expectations for business leaders.

In this report, we are not focusing on climate action, but on climate accountability. To achieve real, systematic change, we need companies to adapt a new modus operandi, where the baseline is to take into account, and transparently report, their impact on the planet.

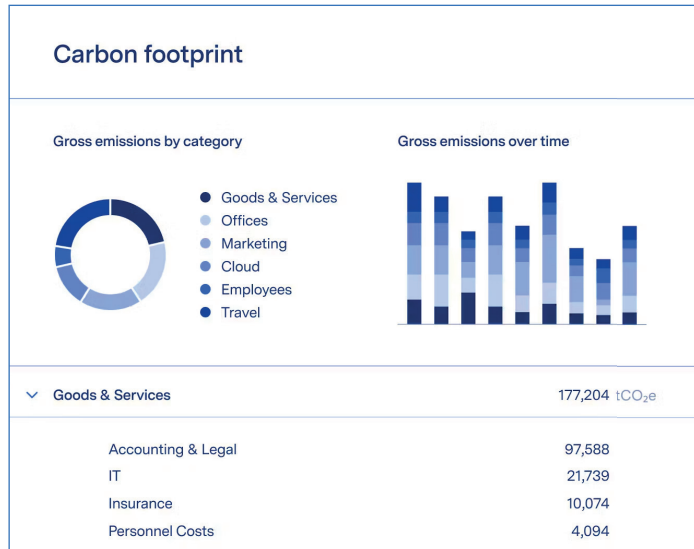
The business imperative for climate accountability

Adapting to a new business-as-usual

The first step towards accountability is to recognise the status quo. What is the carbon footprint of a business’s activities and subsequent impact on the climate? By mapping activities and the emissions related to them, businesses can calculate their carbon footprint and understand what categories the majority of emissions come from.

By reporting – and communicating – the result, stakeholders should be able to see what climate impact the business is accountable for.

CARBON FOOTPRINT BREAKDOWN BY CATEGORY, READY TO BE REPORTED



Choose your reports

CDP
Carbon Disclosure Project

TCFD
Taskforce on Climate-Related Financial Disclosures

SECR
Streamlined Energy and Carbon

Watershed Carbon Reporting
Full scope 1-3 emissions for general

Source: Watershed

The data retrieved in this carbon accounting process is in turn the foundation for targets, forecasts, and effective reduction initiatives.

As a more holistic view on impact and value creation are being forced into reporting by regulators, businesses are starting to pay closer attention to their carbon footprints.

The European Union's Corporate Sustainability Reporting Directive (CSRD) will require carbon measurements to be incorporated in the financial statements and was set to reshape reporting practices for approximately 50,000 EU companies already in 2023. The discussions are also advancing in the United States under the Task Force on Climate-related Financial Disclosures (TFCFD), increasing regulatory pressure on climate reporting from now on.

01 Adapting to a new business-as-usual

Companies will need reliable, scalable and easy-to-use carbon measurement solutions to meet this shift. A recent study by BCG, which included 1,600 enterprises that, in aggregate, are responsible for over 40% of global emissions, revealed that a mere 10% of the companies measured their complete emission footprint in 2022. Moreover, 87% wanted to expand their reporting scope, provided they have better digital tools.

Whether the motivation is to comply with regulations or reduce carbon footprint, everything points towards carbon accounting software becoming just as vital for businesses as the implementation of AWS or a CRM system.

However, the current low adoption suggests that the market is still in its early stages, and we have just seen the emergence of the first generation of software players. Which technological developments do we need to increase the usability of carbon accounting and reach a state of full climate accountability?

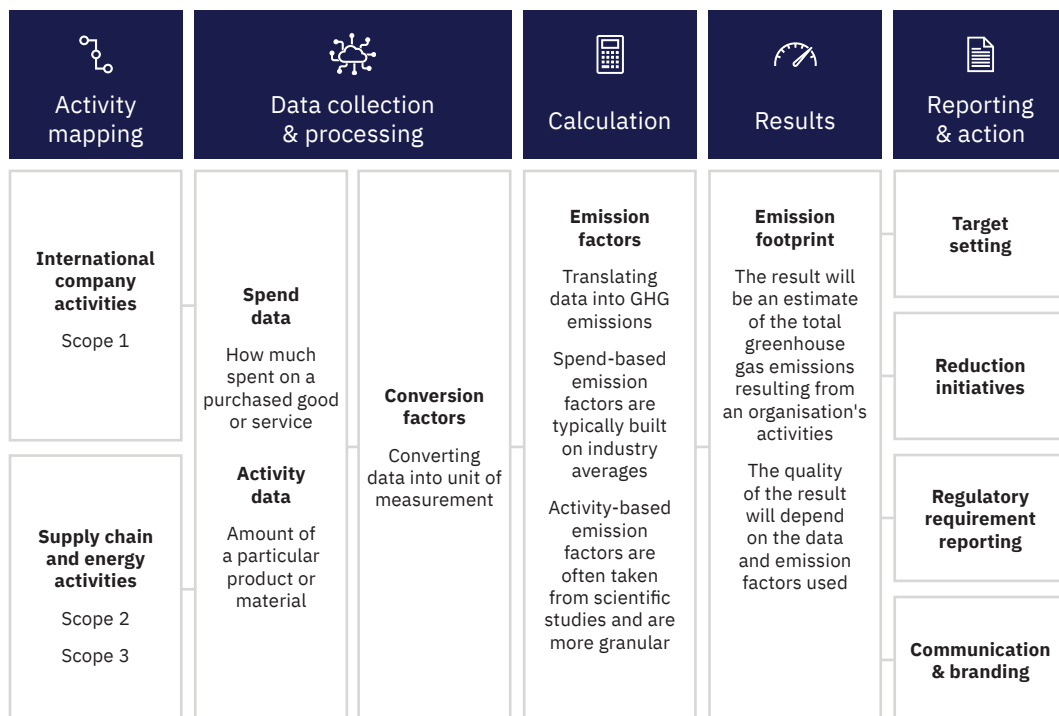
From activities to emissions: the carbon accounting process

High-complexity hurdles put pressure on resources and time

Like financial accounting, carbon accounting quantifies the impact of an organisation's activities – though instead of numbers, it tracks and reports emission units.

Carbon accounting is the systematic methodologies, measurement and monitoring of how much greenhouse gases (GHG) are emitted by a business. The process can be split into five stages. As the operational applicability of emission calculations evolves, it emerges into a dynamic loop rather than a static line.

VISUALISATION OF THE CARBON ACCOUNTING PROCESS,
FROM MAPPING ACTIVITIES TO REPORTING RESULTS



Source: Normative, GP Bullhound Insights

1. Activity mapping: To begin with, oversight of all the business's activities and the data available is needed. Depending on the standards the business needs to comply with, specific data types might be required. Accounting for internal operations is insufficient to calculate a business's total carbon footprint (Scope 1). Indirect emissions from goods and services purchased from suppliers must also be considered (Scope 2–3). In fact, 90% of a business's carbon footprint comes from indirect emissions.

- 2. Data collection and processing:** The data should help determine the activities' size, scope or nature. Both spending and activity (e.g units) measurements should be used. For example, business travel data can be collected by 1) the number of flights, kilometres, or fuel used or 2) the amount spent on air travel for the company. Then, the data needs to be processed into an applicable format. If you measure energy usage in one specific unit, but emission factors are based on kWh (see below), the data must be converted to kWh units.
- 3. Calculation:** After collecting and processing data, you apply an emissions factor to translate it to carbon emissions. The calculations are performed with different methodologies depending on what data you have – spending or activity. A hybrid methodology combines both.



The activity-based method uses unit-level data involved in producing or consuming a particular product, material or service, and multiplies it by an emissions factor – the amount of emissions produced by consuming that unit. The factors are often taken from scientific studies linked to that specific material or activity.

Activity data generally **allows for more accurate emissions estimates** than spend-based data, but it's not as available and is more **time-consuming and complex to gather**. In particular, it will be difficult to gather for indirect and Scope 3 emissions.

Example: If you manufacture chairs, an activity-based approach could factor in how many kilograms of steel and other materials are used, and where these input factors come from, to provide a carbon footprint specific to your product.



The spend-based method takes the financial value of a purchased good or service instead, and multiplies it by an emissions factor – the amount of emissions produced per financial unit.

Spend-based emission factors are typically derived from environmentally extended input-output (EEIO) models that depict the flow of resources between different sectors of the economy. Based on this, one can calculate the average amount of emissions associated with each unit of money paid in a specific industry and region.

Since spend-based methods' emission factors are built on industry averages, the calculations can lack specificity and are often not seen as the preferred methodology.

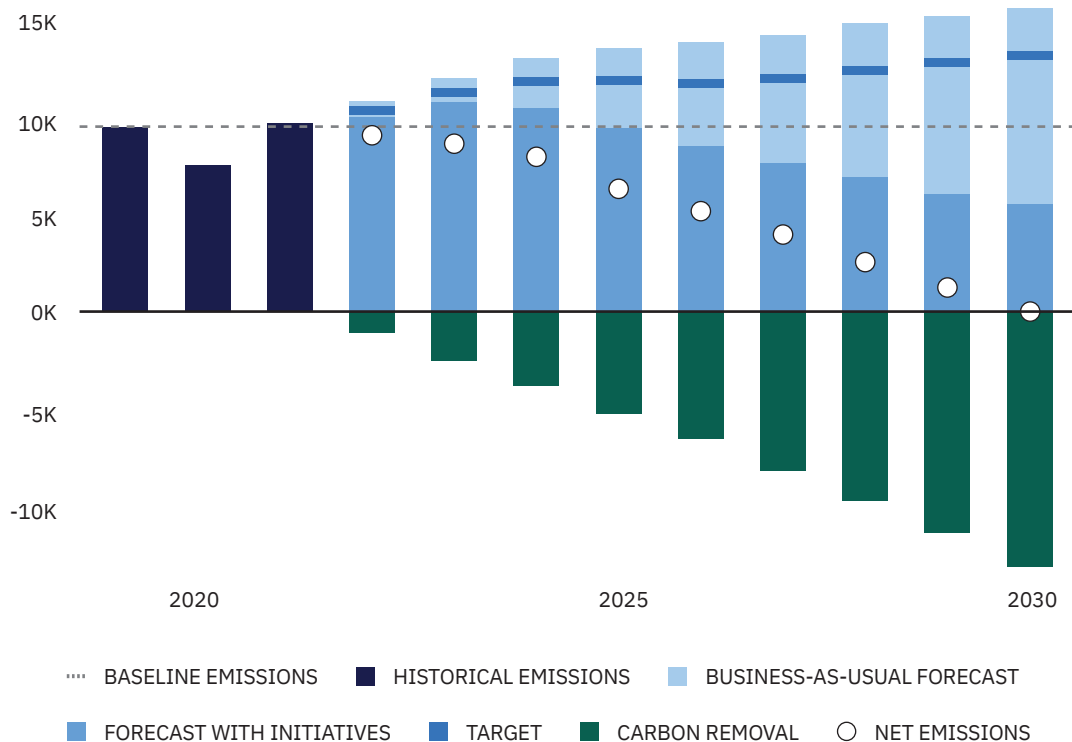
Example: A spend-based approach would generally factor in that you produce a chair, and wouldn't account for whether the chair was made of iron or wood, or if it was transported from China or the US.

Source: Normative.io

4. Results: The main output from carbon accounting is the estimate of an entity’s emissions footprint. The accuracy of this estimate will depend on the quality of data inputted, and the precision of the emissions factors used. However, it is important to note that a rough estimation will still help to get a better understanding of your emissions footprint.

5. Reporting and action: The results can be used in multiple ways. Foremost, through the final reporting of a business’s carbon footprint, regulatory requirements and new demands from stakeholders will be met. With conditions such as transparency and reliability, there will ultimately be a system holding businesses accountable for an important part of their climate impact. Furthermore, the emissions data creates opportunities for action and planetary impact, as it enables the identification of effective targets and strategies for emission reductions.

FACILITATING ACTIONS FOR COMPANIES



Source: Watershed

01 High-complexity hurdles put pressure on resources and time

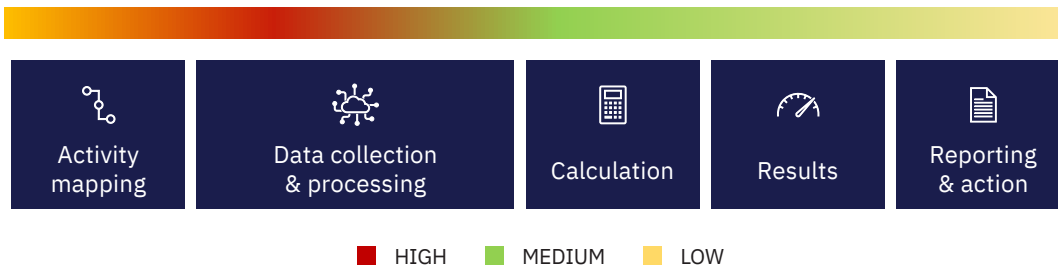
The emissions calculation is not the most complicated part from a customer's perspective. The step of deriving the data that comes before is what makes carbon accounting complex and time-consuming.

In particular, the complexity occurs in:

- **Activity mapping:** Identifying all the activities the business is engaged in – internally and across the supply chain – and where data is available is time-consuming and a first manual hurdle.
- **Data collection & processing:** Collecting data in non-standardised and non-digital formats from all relevant sources, often requiring manual processing and calculation ingestion.

ILLUSTRATION OF THE LEVEL OF COMPLEXITY AND TIME REQUIRED IN THE CARBON ACCOUNTING PROCESS

Level of complexity and time spent



Source: GP Bullhound Insights

With this complexity in mind, carbon accounting is also a new exercise for many companies. And, when incorporating a new internal bottom line and reporting it to stakeholders, companies want to get things – just about – right. A first step in getting educated about the process and how to think about the underlying data is required.

Due to the factors above, sustainability consultants and legacy carbon accounting providers have historically provided customised services, guiding customers through this process or performing fully outsourced work.

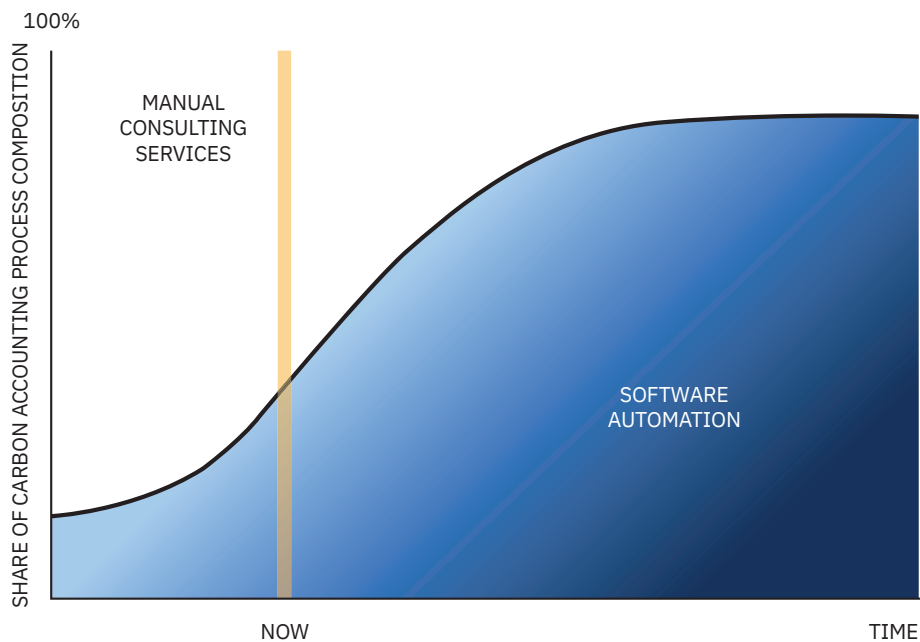
Carbon accounting software, at your service

With the tailwinds of increased ESG focus and aspiring to help businesses automate the complex process outlined above, carbon accounting software raised around \$400m in capital in 2021 and \$970m in 2022.

Cloud-based digital platforms that are starting to use machine learning and AI to calculate emissions and perform analytics have been pivotal and vital shifts in the market. Apart from the obvious benefits of going from manual processes and spreadsheets to a digital platform, software providers have made carbon accounting more broadly accessible, dynamic and compliant.

While these developments have major benefits for the applications of carbon accounting, customers still need support in its current state. Carbon accounting software users spend 75% of their time mapping business activities and the right data inputs on average. Customer and expert interviews show that one of the most determining factors for businesses when selecting carbon accounting providers is the level of manual support and strategic services through the data collection stages and beyond.

MOVING TOWARDS FULL DIGITALISATION:
WE HAVE REACHED THE STATE OF DIGITAL-FIRST CARBON ACCOUNTING SERVICES



Source: GP Bullhound Insights

Conclusively, carbon accounting software providers have driven significant digitalisation to the process, but are still highly reliant on including or combining manual services with their offerings.

Nevertheless, the current carbon accounting software providers are the ones paving the way towards the new era of business-as-usual, and we have only just experienced the first generation of innovators.

Source: Sifted, Trends.co

Increased automation is crucial for wider adoption

Key hurdles for automation of activity data collection and processing

Infrastructure that solves for data

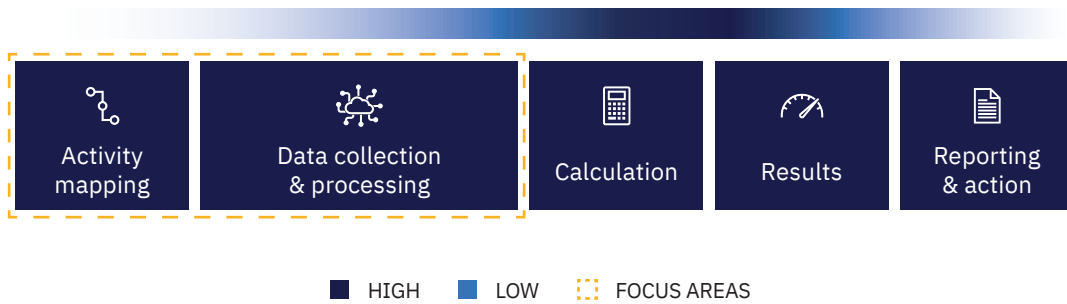
Regardless of expected regulations, the majority of companies are not dedicating the time and resources currently needed to perform reliable carbon accounting. Increased automation will decrease the complexity and be vital to a continued adoption of emissions reporting.

In time, it is also an important driver for climate efforts. A study by BCG reveals that organisations with more automated solutions for emission measurement are 2.2 times more likely to measure emissions comprehensively, and 1.9 times more likely to reduce their emissions.

The first generation of software providers has come a long way in automating the calculation part. With the use of AI and emissions factor databases, the conversion of activity data into carbon footprint has reached a high degree of automation in the current state.

THE CURRENT STATE OF CARBON ACCOUNTING AUTOMATION AND AREAS TO IMPROVE

Level of automation



Source: GP Bullhound Insights

Looping back to the challenges with the complexity explained above, it is unsurprising that activity mapping and data collection and processing will be the hardest components to automate.

01 Key hurdles for automation of activity data collection and processing

Carbon accounting software customers and industry experts identify three key areas slowing down the automation and wider adoption of carbon accounting software:

- 1. Retrieving supplier (Scope 3) data.** Getting the correct data from suppliers is a daunting task, and it grows with the size, geographical scope, and complexity of your value chain. The process spans from identifying the suppliers and data in question, which some suppliers are not able or willing to share. This results in a heavy reliance on third-party entities for a business to perform carbon accounting. The dependency can jeopardise the reliability of results as well.
- 2. Ongoing need for manual processing of unstructured data.** The absence of standardised data formats and the array of sources from different providers necessitate time-consuming, manual processes to prepare the data for use. To illustrate, consider the seemingly routine electricity bills. A business might have a set of providers where the data arrives in diverse formats, such as PDFs or Excel sheets, at different frequencies. They might not even measure electricity in the same unit. To ensure compatibility with the software, manual gathering, cleaning and reformatting of this data is required continuously.
- 3. Non-standardised practices overwhelm.** As both methodologies and data formats lack standardisation, there is room for various approaches simultaneously, as compliance with existing regulations is the objective. Considering that carbon accounting has only existed for around 20 years, it is unsurprising that no unified system has yet been developed. Frameworks such as the GHG Protocol and the Global Reporting Initiative (GRI) are moving the needle, but an interoperable data format is still years away.

02 Infrastructure that solves for data

While the challenges above all require a more maturing state of the market and systemic change, there are a few key developments that will help accelerate process automation.

- Enabling automated carbon accounting by ‘solving for data’

AI to structure and clean data. Generative AI has unlocked possibilities to automate text-to-output and repetitive tasks in every industry. In dealing with large quantities of unstructured data, such as in the example of electricity bills, applying natural language processing to pull the right line items will increase the speed and ease of such laborious tasks. While AI to help data structuring in general will be important, companies like Briink are already innovating ESG insights and document analytics with AI.

Full traceability of AI-enabled output. The advancements above are not sci-fi with the current speed of AI innovation. However, the technology can only be used to its full potential where the output is reliable and always traceable. This means that even if an AI assistant retrieves and processes your electricity data, an auditor must be able to trace the data back to each electricity bill.

Improved API and data integrations in fragmented sub-categories. Once in place, API integrations that pull data automatically from a business's disparate systems ease data gathering immensely. APIs to financial accounting systems are now used to pull spend-based data. However, the scope is much broader in the field of less standardised and precision-activity data. Although some more consolidated sub-category software, like corporate travel, is increasingly interoperable with carbon accounting, many of the integrations needed between data silos and different systems are not there yet.

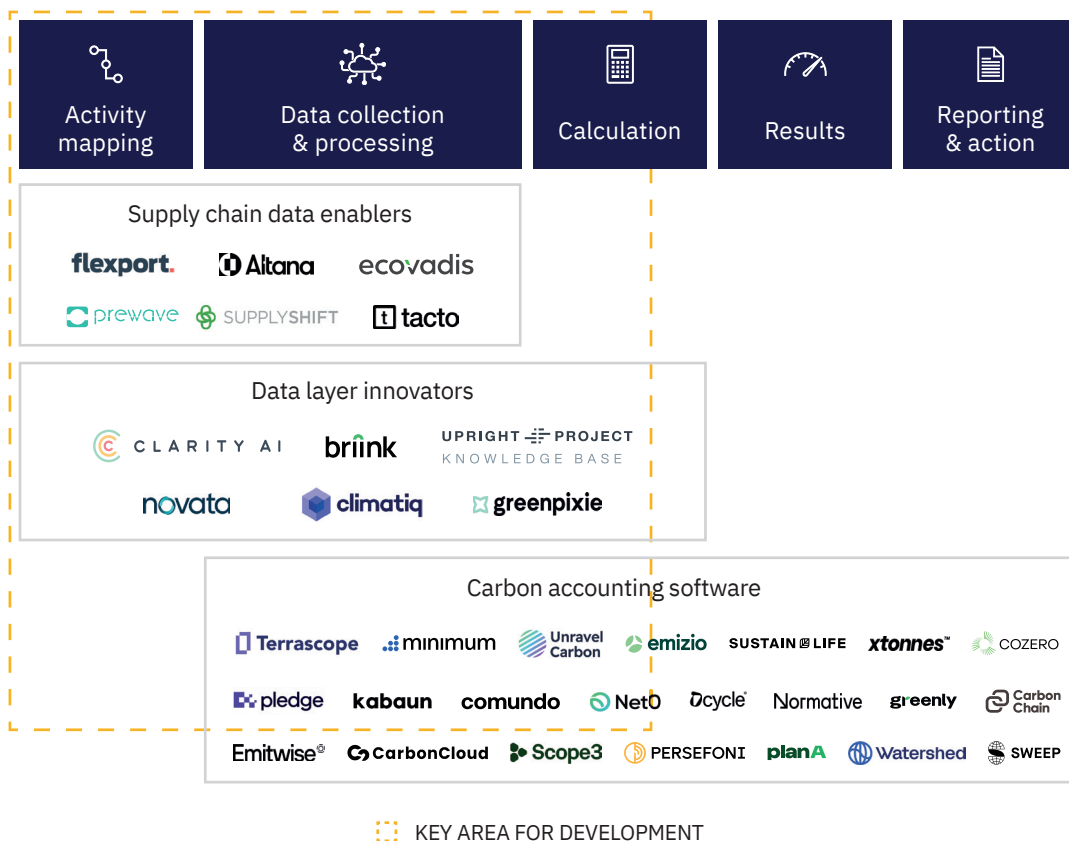
More advanced API solutions, such as API aggregators, open source applications and API-first software, will be crucial to enable automated data gathering and viability of carbon emissions metrics. We are already seeing influential innovators like ClimaTiq, which integrates carbon emission data into existing business function software via its API.

Digitising supply chains and sustainability data. Retrieving data from suppliers is difficult because we first need full data availability. As part of the systemic shift towards more transparency across global trade and value chains, multiple efforts on digitalisation and building massive company databases are already underway. Companies like Altana and Flexport are digitising supply-chain logistics and EcoVadis and Prewave supply-chain sustainability compliance. All are building valuable databases consisting of thousands of companies that can serve helpful in other use cases – such as carbon accounting Scope 3 emissions.

Although digitising all the current manual data and processes will take a while globally, the more real-time data we have on companies, the more accessible data gathering will be. These developments are also synergic, as the efforts in carbon accounting will be an essential contributor to procurement, transport and supply-chain decisions.

The efforts driving these developments will result in companies creating **the pick-and-shovel approach for automated and reliable carbon accounting**:

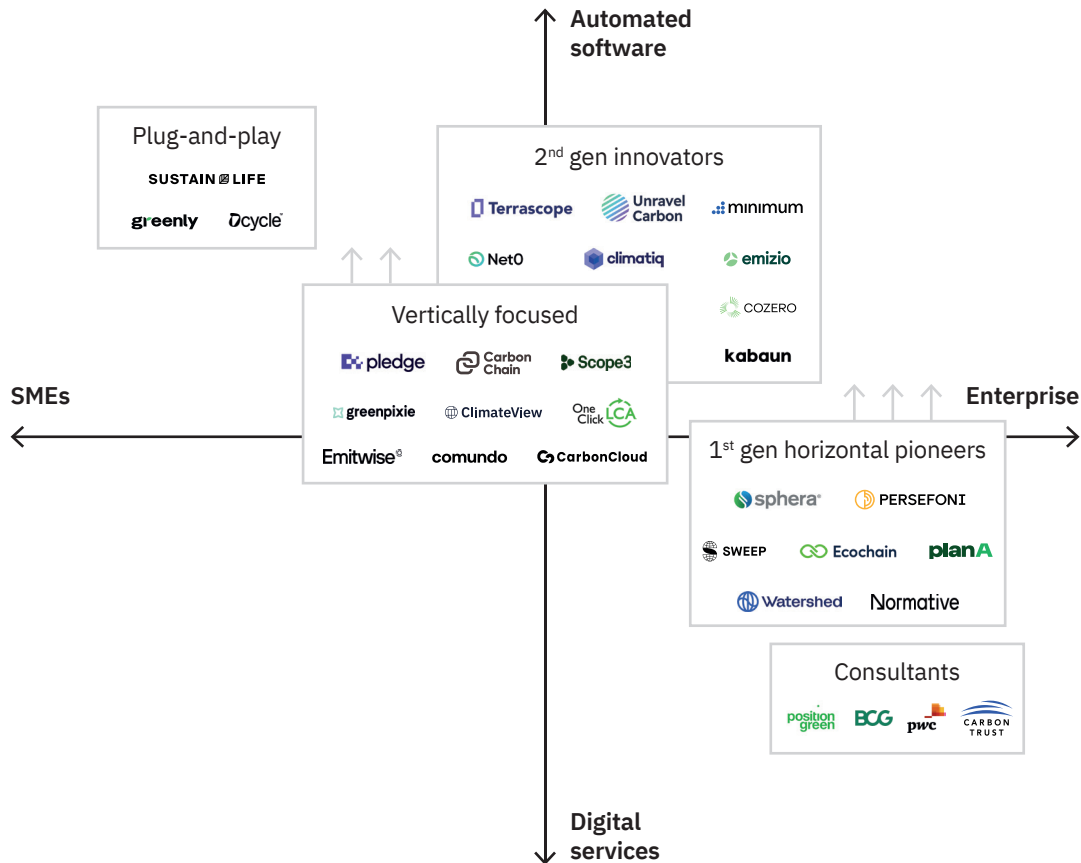
KEY DEVELOPMENTS IN DATA COLLECTION AND INGESTION
CREATING THE PICK-AND-SHOVEL FOR CARBON ACCOUNTING



Source: GP Bullhound Insights

From the end-user perspective, there will not be a winner that takes it all for the use-cases of carbon accounting. Due to the complexity and scope of the process, we won't have a blanket solution. We believe the segments below will have very different customer groups, characteristics and software capabilities in a mature market where multiple vendors will co-exist.

END-USER CARBON ACCOUNTING SOFTWARE FOR DIFFERENT USER-GROUPS



Vertical software is one promising segment targeting a niche industry or sub-category of emissions. By concentrating on building your product for a particular customer or emissions category, there is less variety in customer processes, data inputs and standards, so efforts will be more impactful in solving automation. Industry partnerships which are more customised and high-touch today can later result in a winning tool built on best practices and high-quality datasets.

On the other hand, we believe that well-funded 1st generation software players will see first-mover benefits. With the resources to be at the forefront of the key developments, either by in-house development or acquisitions, several players will be well-positioned to continue as innovators. Although many of them target enterprise customers, their customer base already serves lucrative access to data and scaling benefits and is positioned for partnerships with big tech.

Lastly, we see that providers focused on the longtail are well positioned to bring a low-touch offering sooner, as SMEs often have simpler data and partner structures. However, with fewer granular requirements, the question is whether carbon accounting becomes a module in more holistic ESG reporting software, rather than a standalone product.

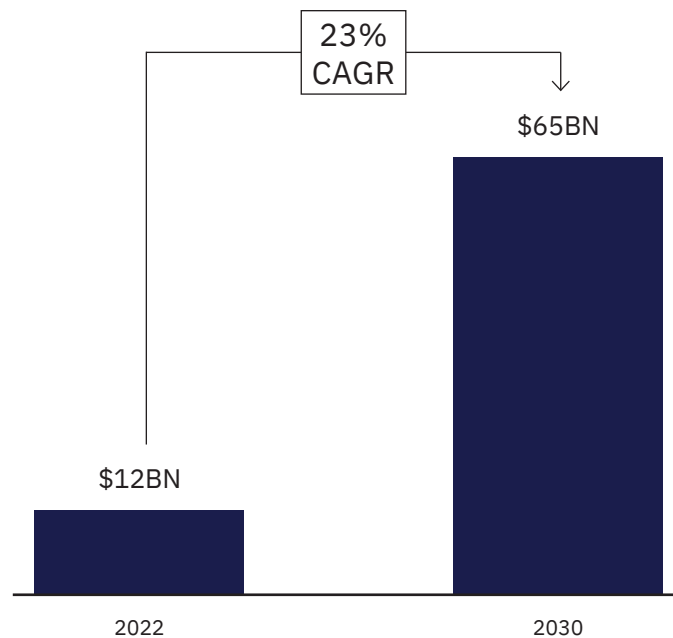
Market potential driven by next-generation carbon accounting technologies

Reaching a state of full climate accountability will be one of the most essential and immediate effective mechanisms for businesses to reconsider 'business-as-usual'. We see a new normal where accountability, transparency, and market powers will enable the transition towards a more sustainable economy.

The indispensable technology and digital tools are leading the charge in this transformation. These are the key drivers propelling the carbon accounting software market from a niche and low-adoption practice to a multi-billion dollar industry. Presently, the market is valued at a substantial \$12bn, with research forecasting a staggering growth to \$65bn by 2030. Technology is the catalyst for a more widespread and efficient implementation of carbon accounting practices, tackling the critical challenge of data complexity and integration head-on.

We are excited to witness the transformative power of AI in structuring activity data and system integrations, paving the way for more viable end-user software solutions. With time, digital supply chains and large real-time databases will facilitate more automated and transparent carbon accounting. It's important to note that different customers will require different accounting solutions. While several systemic developments, such as improved standardisation and more transparent regulations, are necessary, we maintain a positive outlook on technology's ability to address our most critical challenges.

END-USER CARBON ACCOUNTING SOFTWARE FOR DIFFERENT USER-GROUPS



Source: GP Bullhound Insights

Source: SNS Insider

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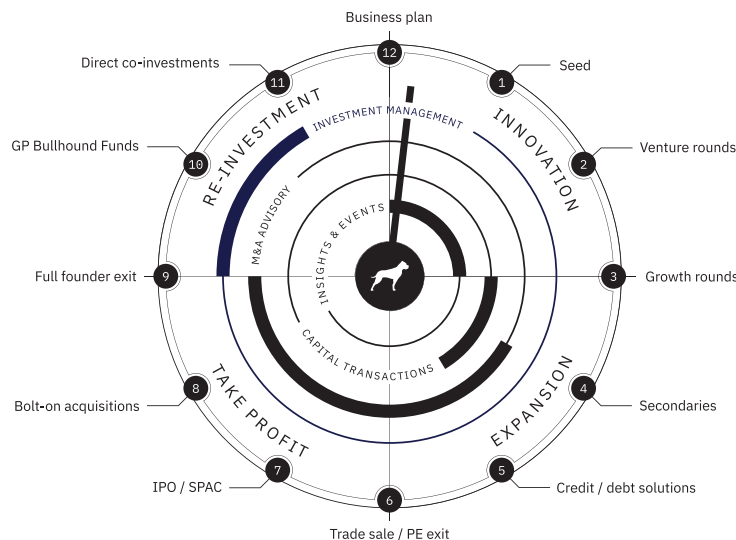
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