Whitepaper

# The business case for sustainability in the pet food industry.

Innovations for a **better world.**

BÜHLER

# The business case for sustainability in the pet food industry.

**The pressure on companies to quantify and reduce their environmental footprint is increasing. First, new regulations have entered into force across the globe – the Corporate Sustainability Reporting Directive (CSRD), which impacts approximately 50,000 companies in the EU (1), and the recently adopted rules to mandate climate risk disclosures by the U.S. Securities and Exchange Commission (SEC) (2). Second, as of March 2024, more than 7,000+ companies all over the globe have voluntarily signed up to the Science Based Targets initiative (SBTi) and more than 5,000 have set up targets that align with a Net-Zero pathway (3). In the words of Peter Bakker, CEO of the World Business Council for Sustainable Development: "Sustainability is going mainstream for governments, business, consumers, and financial markets (4)."**

This paper provides an overview of the key sustainability requirements from various stakeholders, including governments, companies and consumers. Using both greenhouse gas (GHG) accounting and life cycle assessments (LCAs), it considers how environmental sustainability can be quantified in the pet food value chain, and the key steps in reducing the environmental footprint.

The pet food value chain and its importance should be included in the debate on food system sustainability, as it accounts for 1.1%-2.9% of the global agricultural GHG emissions (5) and has a projected sales increase from $51 billion in 2023 to $73 billion in 2027 in the US alone (6). This significant growth owes not just to the rising number of pet owners, but also to a shift towards commercial pet foods. Moreover, pet food production requires the use of 0.8-1.2% of global agricultural land use annually, which is roughly twice the land area of the United Kingdom. This footprint is exacerbated by premium pet food products, which, due to their higher meat content, have a larger share in GHG emissions and agricultural land exploitation (5). Recognizing the significant impact of these pet food products, it becomes essential for companies to analyze and understand the full extent of their environmental footprint. By quantifying the environmental impacts of this value chain, companies can initiate a data-based discussion, enabling them to create a competitive market advantage and build a favorable business case for sustainable products. When sustainability is profitable, it will create impact at scale.

Authors: Giulia Manzolini; Carsten Petry; James Maari; Beatrice Petit-Conde.

## Sustainability Guidelines

Coupled with increasing pressure from governments to report climate action, companies must **quantify, understand, report, and reduce the environmental footprint** of their operations and their products. There are several requirements in place,

### Corporate Sustainability Reporting Directive

The Corporate Sustainability Reporting Directive (CSRD) (1) requires that, from 2025, European companies that meet two of three criteria – 500+ employees, at least EUR 20 million in total assets or more than EUR 40 million in turnover – "publish regular reports on the social and environmental risks they face, and on how their activities impact people and the environment".

In a typical footprint for food retailers and processors, most emissions come from their supply chain, known as Scope 3 Category 1 (Purchased Goods & Services) in the GHG Protocol. More specifically, this relates to the raw materials purchased to create food products.

Metrics and target reporting requires companies to:

- Calculate the Scope 1, 2 & 3 footprint according to the GHG Protocol.
- Set targets to reduce emissions.
- Build a climate transition plan to achieve targets and track progress.

As more retailers and food processing companies quantify and reduce their full GHG footprint, they will look for primary data and reduction measures from their supply chains and encourage suppliers to set science-based targets.

## SEC Climate Risk Disclosures

Shortly after being introduced, the new climate disclosure rules issued by the SEC in March 2024 have been temporarily put on hold, as of April 4th, 2024. This pause is due to ongoing legal action from certain states and business groups, with criticism about the rules being overly burdensome and exceeding the SEC's authority. The SEC, however, defends its position, believing they fall well within their remit to mandate information crucial for investor decisions (7).

The adopted rules intend to improve and standardize climate-related disclosures by public companies and in public offerings, responding to investor calls for more uniform, comparable, and dependable climate risk information. These disclosures are aimed at informing investors of the financial implications of climate-related risks on a company's business and the steps companies are taking to manage these risks, while also addressing concerns about the cost implications of compliance.

Key highlights from the SEC's sustainability guidelines include:

- Companies must disclose climate risks that significantly affect their business, operations, or financial health.
- Firms are required to detail how climate risks impact their strategy, business model, and outlook.
- Companies must quantitatively and qualitatively describe efforts and costs to mitigate climate risks.
- Consistent details on risk management processes and the integration with overall risk management are necessary.
- Climate-related governance by the board and management must be described.
- Disclosure of climate-related targets or goals and their financial impacts is required.
- Scope 1 and Scope 2 emissions reporting is mandatory for certain filers, with assurance reports required.
- Notes in financial statements must report costs and impacts related to severe weather and natural events (2).

### Science Based Targets

More companies are signing up to the Science Based Targets Initiative (SBTi), which requires companies to quantify the GHG footprint and set targets that follow the 1.5°C or "well below 2°C" line (8). In a typical footprint for food retailers and processors, most emissions come from their supply chain, known as Scope 3 Category 1 (Purchased Goods & Services) in the GHG Protocol. More specifically, this relates to the raw materials purchased to create food products.

Quantification of the carbon footprint at product level enables a more data-based discussion of reduction measures across the supply chain, and greater opportunities to finance carbon reduction initiatives in all areas of the value chain.

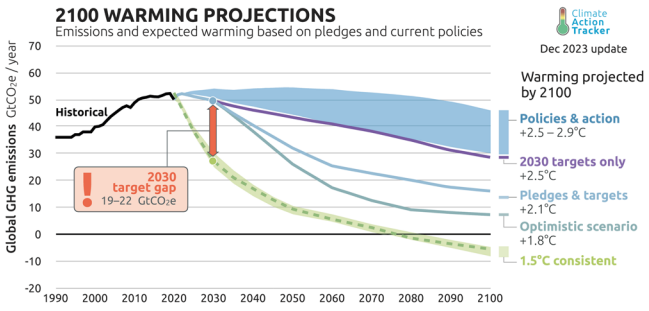


Figure 1: 2100 warming projections (9).

## Quantify sustainability in pet food

Two main standards exist to quantify environmental impact and are applicable for the pet food value chain: the GHG Protocol and life cycle assessments (LCAs).

### Greenhouse Gas Protocol (10)

A GHG assessment quantifies the $CO_2e$ ($CO_2$ equivalent) impact of the entire business every year by splitting emissions into Scope 1, 2 or 3. This is both a regulatory and an SBTi requirement and can be certified to either the GHG Protocol or ISO 14064.

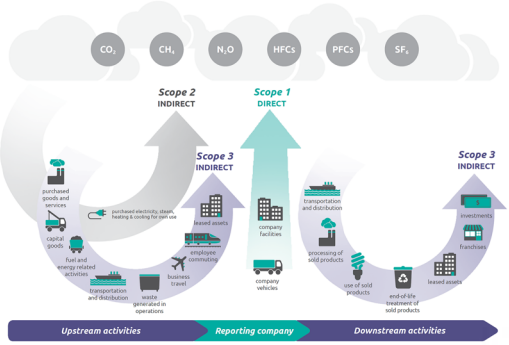


Figure 2: Scope 1, 2 and 3 emissions in the GHG Protocol (11).

## Greenhouse Gas Protocol (10)

**Scope 1** includes direct emissions by sources owned or controlled by an organization e.g., emissions from combustion of fossil fuels in boilers and vehicles.

**Scope 2** includes indirect emissions resulting from the generation of electricity, heat, or steam that an organization purchases. These are not controlled directly by the organization, but they can exercise some control by choosing their electricity or heating plan.

**Scope 3** includes all other indirect emissions from **upstream** and **downstream** activities, such as the production and transportation of purchased goods and services, employee commuting, and waste disposal.

### Life Cycle Assessment

The second method is the life cycle assessment (LCA), where assessments can be certified to ISO 14067 (12). An LCA measures the impact per unit of the final product, taking into consideration the impact across the entire value chain.

### Defining Functional Units in Pet Food Analysis

For effective LCA in pet food production, establishing functional units is critical. These units are the benchmarks that allow for the comparison of inputs and outputs across the lifecycle. For example, they can be specified as a mixture of 0.3 kg of meat & bone meal along with 0.3 kg of fishmeal for every kilogram of pet feed produced. The LCA process considers various stages from 'cradle to gate'—which includes raw materials to processing—as well as 'cradle to grave,' which extends to the product's end of life. It can also take other metrics into account, such as water usage and agriculture land occupation.

### Raw Material Constituents and Determinants in Pet Food

The composition of pet food widely varies, and as such, it is essential to pinpoint the raw materials and their proportions for LCA. Determining factors such as the intended consumer market—like cat or dog food—or specific dietary requirements—such as hypoallergenic or high nutritional value diets—play significant roles in deciding the ingredients. Typical raw materials consist primarily of animal by-products (13).

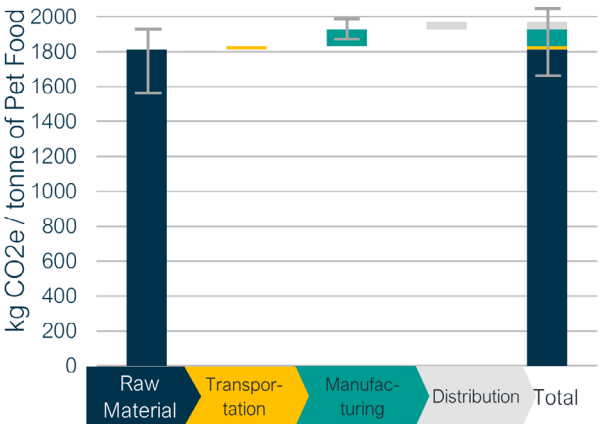


Figure 3: Typical $CO_2e$ footprint of pet food for cats, Bühler calculation.

## Typical LCA for Pet Food

Where GHG accounting fulfills legislative requirements,

an LCA is a powerful tool in understanding carbon hotspots across the value chain, where to focus sustainability efforts and how to communicate sustainability reduction measures to customers, investors and consumers.

Figure 3 above shows the typical $CO_2e$ footprint of pet food. In the example of Figure 3, the raw materials consist of the following: animal protein meal, cereals with varying fiber content, fat and vitamins.
The exact figure will change depending on several factors, including the raw materials, manufacturing facilities, packing and transportation, among others. However, some general assumptions can be made:

- Most of the pet food emissions originate from raw materials. Therefore, avoidance of waste and optimization of yield is critical.
- Where the raw materials are dried, cooled/heated or heat treated, manufacturing emissions can be large.
- Logistics contributes a significant proportion of the emissions per ton of raw material, particularly where there is long transportation by trucks.
- Packaging has a small $CO_2e$ footprint but is important in waste reduction.

Another advantage of an LCA is quantification of the impact of multiple metrics. Figure 3 shows a typical carbon footprint of pet food. The same analysis method can be used to quantify $m^3$ (or AF) of water and $m^2a$ (or $mi^2a$) of land per ton of product. Multimetric analysis is important to ensure that reduction or optimization measures do not negatively impact other categories.

If you are interested in quantifying your GHG footprint, or conducting an LCA, the Bühler Environmental Impact Services can support you. **For more information, scan the QR code.**

## Use an LCA to build a competitive advantage

Animal byproducts are used in many products and contribute a significant proportion of the raw material emissions. By quantifying the footprint of the final product, pet food retailers can communicate the benefit of their sustainability efforts in quantifiable terms, and how their product supports the sustainability efforts of the downstream process.

Figure 4: Premium pet food from Bühler.

## Reduce the environmental footprint in the Pet Food value chain

When companies sign up to the SBTi, they commit to measuring and reducing emissions consistent with the level of decarbonization required to keep the global temperature increase well below 2 degrees Celsius, and to pursue efforts to limit the temperature increase even further to. 1.5 degrees Celsius compared to pre-industrial levels.

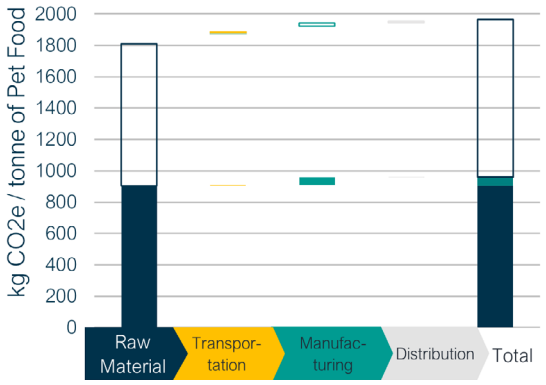


Figure 5: Example reduction of the pet food footprint.

The following section provides an overview of the key steps required to reduce the environmental footprint across the entire pet food value chain. The LCA analysis is a powerful tool in enabling collaboration and data-based decision making for reduction of the environmental footprint of pet food, as shown in Figure 5. Where possible, reduction measures that have a return on investment should be made first.

## 1. Reduce Scope 1 & 2 Emissions

While the $CO_2e$ emissions associated with the manufacturing process may appear small when compared to the raw materials, both are crucial factors that influence sustainability. Optimal selection of raw materials not only improve yield but also contribute directly to reducing overall emissions. Nevertheless, energy reduction initiatives within the manufacturing process typically have a fast ROI and should be executed first. This section presents a few reduction measures for effectively cutting down on energy use

**Reduce Scope 1 Emissions:**

- During stable manufacturing conditions, prioritize the reuse of waste heat from manufacturing processes, such as drying and grinding, as the primary source of building heating or process energy when possible.
- Customized performance assessment workshops (PAW), can help organizations optimize asset utilization, leading to increased operational efficiency and reduced Scope 1 emissions, as exemplified by the decreased consumption of natural gas through improved equipment performance and energy management strategies. These assessment workshops are regularly carried out by Bühler experts (TotalCare).
- When products are dried after extrusion, waste heat should be recovered and upgraded with retrofits such as heat pumps to reduce energy use, save costs and emissions. Emissions can be reduced up to 45% and thermal energy savings up to 30%.[1]

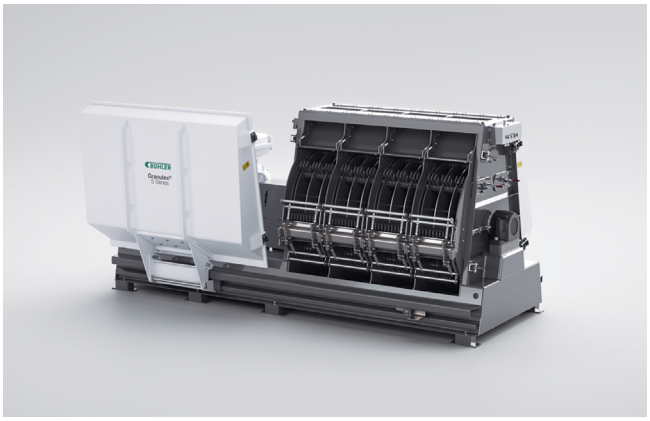

Figure 6: Bühler's Hammer Mill.

**Optimize Scope 2 Emissions:**

- Ensuring efficient machinery for increased performance and energy optimization. Given that most Scope 2 emissions come from manufacturing, solutions such as a modern hammer mill can minimize the footprint. For example, the Granulex hammermill (Figure 6) can enable energy savings up to 30% in the grinding process.[1]
- Manage production efficiently by optimal production planning, intelligent process routing and automatic process reactions to exceeded values with automation solutions. Optimized maintenance and process are crucial, as an optimized plant will use up to 10% less energy than an inefficient maintained and adjusted plant[1]. The energy consumption can be continuously optimized with a customized performance assessment workshop (PAW), which is regularly carried out by Bühler experts (TotalCare).
- Ensure the equipment around the processes are up to date, for example replacing old lighting systems with LED solutions.
- Use smart sensors to measure energy consumption across the manufacturing process, avoid energy spikes, minimize machine idling times and maintain an overview of equipment status. For drying moisture automation, read more about how Bühler's DryingPro can reduce up to 6% of the energy consumption during the drying process and optimize the yield by up to 10%.[1]

[1] Based on Bühler customer trials.


**Werner Bobach**
Production Manager
Interquell, Germany

"Bühler's DryingPro service enables us to sustainably improve the high-quality standards we set for product quality and the environment. Thanks to active drying control, we have been able to reduce moisture fluctuations in our end products by 60% and realize energy savings of 35%."

### Renewable Energy

The use of renewable energy reduces Scope 2 emissions to 0 and Scope 3 emissions of energy production close to 0. Renewable energy is a critical step in the Net-Zero journey (14). Three key methods increase the use of renewable energy:

- Produce renewable energy on site (such as solar panels, direct drive from water sources).
- Buy renewable energy certificates (from electricity providers or energy brokers).
- Develop a power purchase agreement (PPA).

An energy strategy should reduce consumption (e.g. switch off appliances not in use) and optimize consumption (e.g. better machinery) as much as possible. When considering the product and/or procurement of renewable energy, consider the following key points:

- Ability to use on-site renewables (e.g. solar, heat pumps).
- Reuse of waste heat.
- Availability of local infrastructure.
- Costs per ton of $CO_2e$ reduced.
- Return on investment using different methods.
- Business risk (e.g. long-term contracts).

The various methods of producing and/or procuring renewable energy have different benefits, drawbacks and costs. For example, producing energy on-site through renewables guarantees the cleanest form of energy and often has a medium-term return on investment, but will rarely cover the full needs of production. PPAs often create new renewable energy infrastructure and can guarantee energy prices over the long term, but projects are subject to availability, have long lead development times and are suitable only when procuring enough energy (unless the PPA is split with other companies). For more information on PPAs, click here.

Renewable energy certificates have been criticized (for example, in the Corporate Climate responsibility monitor (15)). However, their purchase can be an effective method of making up the remaining kWh not covered by PPAs or on-site production.

When communicating the renewable energy strategy, it's important to transparently report emissions e.g., kWh consumed, kWh reduced, location-based $CO_2e$ and market-based $CO_2e$.

## 2. Reduce Scope 3 Emissions

As shown in Figure 3, the raw materials can comprise up to 92%[1] of the footprint of pet food and can be constituted of animal protein meal, high and low fiber cereals, fat and vitamins. To address the most significant part of emissions, it is essential to sustainably procure raw materials for pet food.

### Constituent Variability with Insects

The raw material constituents for pet food vary according to producer and consumer demand e.g., sustainability, hypoallergenic, nutritional value and palatability. With agricultural emissions and land use related to raw materials depleting, alternative sources of raw materials are gaining momentum.

Producers and value chain partners downstream are beginning to incorporate insects as a primary constituent in pet food (16), replacing animal and bone meal, as insects require significantly fewer resources for rearing compared to conventional livestock and emit less greenhouse gases. Insect proteins are also positioned as a hypoallergenic alternative to animal proteins, which can be a favorable alternative for sensitive pets. The most common insects used in pet

[1] Based on Bühler customer trials.

food are black soldier flies and mealworms (17). By incorporating insect meal as a primary constituent in pet food, $CO_2e$ emissions can be reduced up to 30%[1] as well as GHG emissions by minimizing land use. Overall, it is highly probable that the use of insect meal in the animal feed sector will rise in significance, with manufacturers, consumers, and regulatory bodies becoming more receptive to it over time.

### Traceability and Quality

The focus of pet food companies should be on gathering data from suppliers to increase the volume of primary data in $CO_2e$ quantification and increasing traceability throughout the value chain. Connection of the footprint of raw material production to the end-product creates a data-based discussion on reduction measures, enabling the responsibility and capital available for reduction measures to be shared among all stakeholders along the value chain. More data on the input raw materials will also improve processing and thus quality of the end-product.

### Local and Responsible Sourcing

Sustainability extends beyond environmental impact, entailing a delicate balance among the three pillars of sustainability: economy, environment (climate and biodiversity), and humanity (social aspects). When making key decisions, such as sourcing materials locally or importing them, $CO_2e$ per ton of raw material emerges as a pivotal criterion. This criterion coincides with the circular economy's emphasis on responsible resource use, which advocates for the selection of materials with regard to its entire life cycle – ultimately supporting business models that consider not only up-front sustainability metrics but also longer-term environmental benefits through reduced waste and optimized resource recovery. Local sourcing initiatives can therefore be designed to feed into a circular model, where materials are kept in use for as long as possible and waste is seen as a resource, providing local communities with both economic and ecological stability.

## Quantify the impact of sustainability measures

Quantifying the $CO_2e$ footprint is the first step in reducing emissions and building transparency in the value chain. From there, the key levers for change (such as cost per ton $CO_2e$ reduced with renewable energy) is needed to reduce $CO_2e$, value chain emissions and comply with reporting requirements. Often subsidies are available for technology that reduces energy or $CO_2e$, and these quantifications can be used in applications for subsidies.

## Sustainability and Industry Collaboration

Joint efforts across different sectors are essential for a swift and effective approach to climate change. Industry collaboration, encompassing tech innovators, agricultural producers, and consumer engagement is crucial for meeting environmental regulations effectively. A prime instance of this collaborative impact is seen in the projects between Bühler Group and Improvin', a Swedish climate technology firm. Through this venture, Improvin' offers a platform that empowers food producers to calculate and report the carbon footprint of their operations and products comprehensively. More information can be found in Bühler's press release.

Such initiative is but one example of the strong efforts encompassed along the value chain. Around the world, a multitude of partnerships are taking shape, forming a collaborative network of committed companies and organizations focused on sustainable practice implementation. These ventures are pooling their capabilities to not only adhere to environmental regulations but to also set new standards in sustainability. Through the exchange of best practices and advanced technology, these partnerships are significantly reducing their environmental impact, and are establishing new benchmarks for the entire industry. These strategic collaborations are pivotal for driving innovation and fostering a culture of sustainability within their respective fields.

[1] Based on Bühler customer trials.

The promotion of a circular economy and the importance of recycling are additional keys to unlocking a sustainable future. In this economy, product lifecycles are extended through thoughtful design, use, and reuse, ensuring that every resource is maximized, and waste is minimized. Recycling not only conserves resources and reduces landfill waste but also diminishes the demand for raw material extraction, thus decreasing greenhouse gas emissions.

By adopting recycling practices and the wider concept of a circular economy, industries contribute to a more sustainable and efficient use of resources. This transformation is facilitated by innovation in material processing, product design, and waste management, creating an environment where materials circulate within the economy for as long as possible. Therefore, the embedding of circular economy principles into business models is gaining momentum, promoting a new idea of growth. The growing trend of joint ventures signifies a move towards a collaborative approach to tackling environmental challenges, emphasizing the power of unity in our path towards a more sustainable and prosperous planet. The adoption of circular economy practices is a testament to this, illustrating a commitment to sustainable transformation at all levels of production and consumption.

## Conclusion

The race is on to 2030. Many governments and companies have made bold commitments to quantify and reduce carbon emissions, and to avoid an increase in global warming of 1.5°C. With a growing pet food industry, there is an important role for manufacturers to play in the fight against climate change. The end-market's impact, such as from retailers or end-consumers, is also playing a considerable role in pet food favorability, making it even more essential for producers to prioritize this added value.

Regulatory requirements, e.g., the CSRD and the SEC, demand that companies have stronger oversight and communications in four key focus areas: governance, strategy, risk management, and metrics and targets. Metrics and targets require a robust quantification and pragmatic reduction plan, identifying the initiatives with the fastest ROI first. LCA assessments are a powerful tool in identifying and quantifying carbon hotspots and can focus reduction efforts and capture the value of sustainability by supporting downstream food processors. This will enable companies to create a competitive advantage and build a favorable business case for sustainable products. When sustainability is profitable, it will create impact at scale.

# References

**1. European Commission.** Corporate Sustainability Reporting Directive. [Online] January 5, 2023. [Cited: March 4, 2024.] https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en.

**2. U.S. Securities and Exchange Commission.** SEC Adopts Rules to Enhance and Standardize Climate-Related Disclosures for Investors. U.S. Securities and Exchange Commission. [Online] March 6, 2024. [Cited: March 18, 2024.] https://www.sec.gov/news/press-release/2024-31.

**3. Science Based Targets Initiative.** Companies Taking Action. Science Based Targets. [Online] [Cited: March 22, 2024.] https://sciencebasedtargets.org/companies-taking-action#anchor-link-test.

**4. WBCSD.** WBCSD steps up the course for systemic business transformation. [Online] World Business Council for Sustainable Development, October 28, 2021. [Cited: June 6, 23.] 8. https://www.wbcsd.org/Overview/News-Insights/General/News/WBCSD-steps-up-the-course-for-systemic-business-transformation.

**5. The global environmental paw print of pet food.** Alexander, Peter, et al. s.l. : Global Environmental Change, 2020, Vol. 65.

**6. Pet Food in the US, 17th Edition.** Freedonia Group. [Online] 2023. [Cited: March 8, 2024.] https://www.freedoniagroup.com/packaged-facts/pet-food-in-the-us.

**7. Securities and Exchange Commission.** In the Matter of the Enhancement and Standardization of Climate-Related Disclosures for Investors. [Online] April 4, 2024. [Cited: April 12, 2024.] https://www.sec.gov/files/rules/other/2024/33-11280.pdf.

**8. Science Based Targets Initiative.** Lead the way to a low-carbon future. Scienced Based Targets. [Online] [Cited: March 11, 2024.] https://sciencebasedtargets.org/how-it-works.

**9. [Online] https://climateactiontracker.org/global/temperatures/.**

**10. GHG Protocol.** Greenhouse Gas Protocol. [Online] [Cited: June 6, 2023.] https://ghgprotocol.org/.

**11. Greenhouse Gas Protocol.** The Corporate Value Chain (Scope 3) Accounting and Reporting Standard. 2011. p. 5.

**12. International Standards Organisation.** Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification. International Standards Organisation. [Online] 2018. [Cited: June 6, 2023.] https://www.iso.org/obp/ui/#iso:std:iso:14067:ed-1:v1:en. 14067.

**13. Thixton, Susan.** What Is The Most Commonly Used Pet Food Ingredient? Truth about Pet Food. [Online] March 16, 2020. [Cited: March 8, 2024.] https://truthaboutpetfood.com/what-is-the-most-commonly-used-pet-food-ingredient/.

**14. United Nations.** For a livable climate: Net-zero commitments must be backed by credible action. United Nations. [Online] 2022. [Cited: March 11, 2024.] https://www.un.org/en/climatechange/net-zero-coalition.

**15. New Climate Institute.** Corporate Climate Responsibility Monitor. 2023.

**16. The edible insect sector in Canada and the United States.** Larouche, Jennifer, et al. 4, Animal Frontiers, Vol. 13, pp. 16-25.

**17. The environmental sustainability of insects as food and feed.** A review. van Huis, Arnold and Oonincx, Dennis G.A.B. s.l. : Agronomy for Sustainable Development, 2017, Vol. 37, pp. 1-14. 43.

**18. FAO.** FAOSTAT. Rome : Food and Agricultural Organisation, 2021.

## Giulia Manzolini – Environmental Quantification Program Lead

Giulia Manzolini graduated at ETH Zurich with a master's in environmental engineering in 2019. She specialized ian life cycle assessments, pollution treatment and waste management. She worked as graduate researcher at Eawag in bioprocess in engineering. She joined Bühler in 2020 and is currently leading the Bühler environmental quantification program. She is responsible for quantifying the Sustainability Impact of all Bühler technologies and services, and to support Bühler Customers to quantify and reduce their environmental impact. She is also leading the sustainability trainings and working with our R&D community to ensure we continue to make progress towards our sustainability goals.

## Carsten Petry – Market Segment Petfood Lead

Carsten leads the Market Segment Petfood at Bühler. In his role he is responsible for ensuring that Bühler's solutions for petfood applications not only meet the market requirements, but also create an added value for their customers. His focus lies on finding answers to current market trends and in developing innovative solutions for Bühler's petfood customers which ensure that also in the future petfood can be produced in a sustainable, safe and efficient manner. Carsten joined Bühler in 2010 and covered different position from Business Development Manager, Product Manager to being the CEO of the Bühler Spin-Off "Circular Food Solutions". His academic background is in Industrial Engineering with a PhD in Strategic Management from the Technical University of Berlin and Valencia

## James Maari – Energy and Resource Efficiency Lead Project Manager

James serves as the Lead Project Manager for Energy and Resource Efficiency at Bühler, bringing over seven years of dedicated expertise in process simulation and energy system optimization. In his tenure, James is tackling the ambitious challenge of delivering customer-centric solutions that achieve a 50% reduction in energy consumption through a focus on energy recovery and optimization strategies, including the expert application of PINCH analysis allowing the integration of cutting-edge technologies into sustainable energy systems.

## Béatrice Conde-Petit – Sustainability Officer

Béatrice Conde-Petit holds the position of Sustainability Officer. She is responsible for Bühler's Sustainability Agenda and drives strategic innovation projects at the interface between science, technology and business leveraging partnerships for impact. In her previous role at Bühler er she has been responsible for the Future of Food program with focus on sustainable food supply and for driving the Food Safety agenda. Béatrice Conde-Petit holds a Diploma and PhD in Food Science & Technology from ETH Zürich. Before joining Bühler in 2008 Béatrice worked at ETH Zurich for 20 years as researcher, lecturer and consultant to the international food industry.

## Bühler AG

CH-9240 Uzwil,
Switzerland

Carsten Petry, Market Segment Petfood Lead
**carsten.petry@buhlergroup.com**
**www.buhlergroup.com**