Service Leaders Focus Day

Service & Sustainability Focus Day

Morning Session I

To avoid the worst impacts of climate change, businesses must quantify and reduce their environmental impact

Jay O'Nien, Environmental Quantification Lead, and
Giulia Manzolini, Environmental Quantification Manager at Bühler

Sustainablity at Bühler

BÜHLER

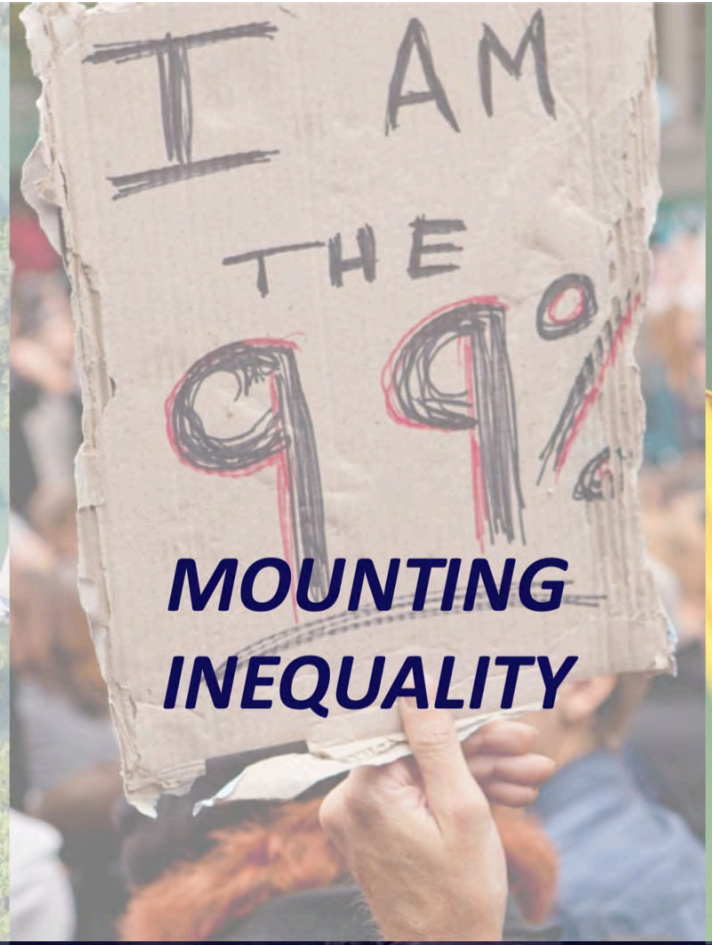
NWD 2019

Do you know your individual carbon footprint?

Do you know your company's carbon footprint?

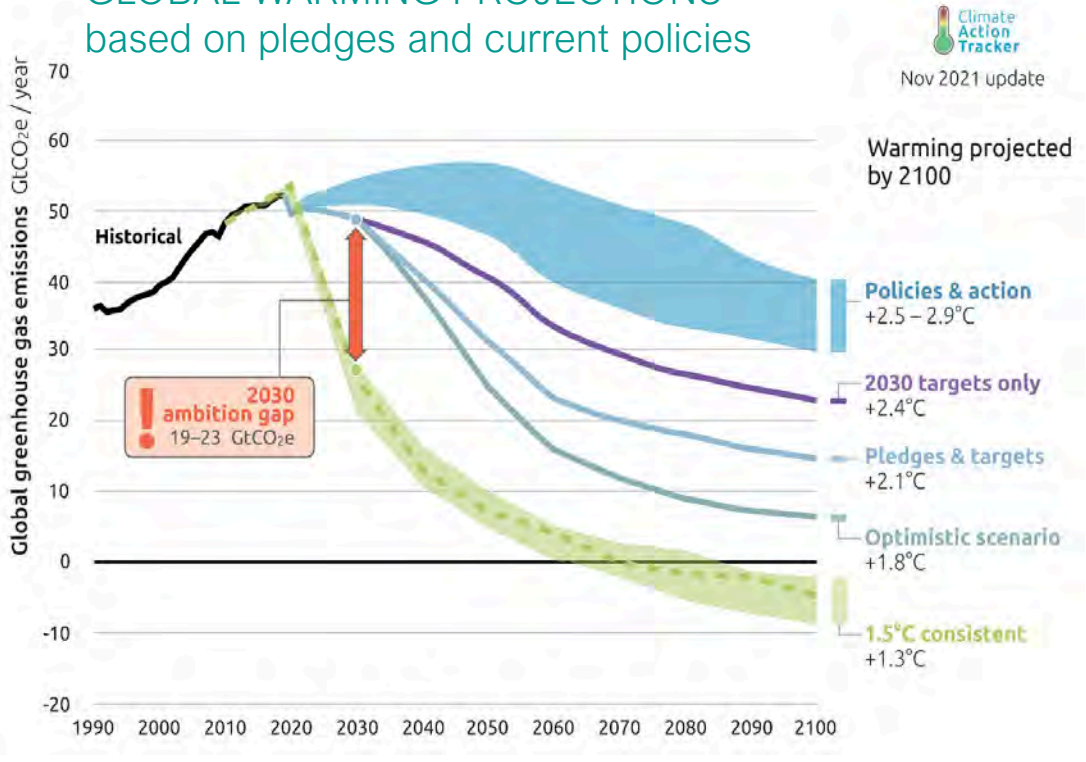
Sunny Veghese, CEO Olam

The world is facing three interlinked sustainability crises



Immediate and deep emissions reductions, meaning a 50% cut in greenhouse gases (GHG) by 2030, are needed to keep global warming on the 1.5 °C path.

GLOBAL WARMING PROJECTIONS based on pledges and current policies



Climate Action Tracker

Example of companies taking action with ambitious climate goals

Nestlé Good food, Good life

FERRERO

Olam

GRUPO BIMBO

MARS

COSTCO WHOLESALE

PEPSICO

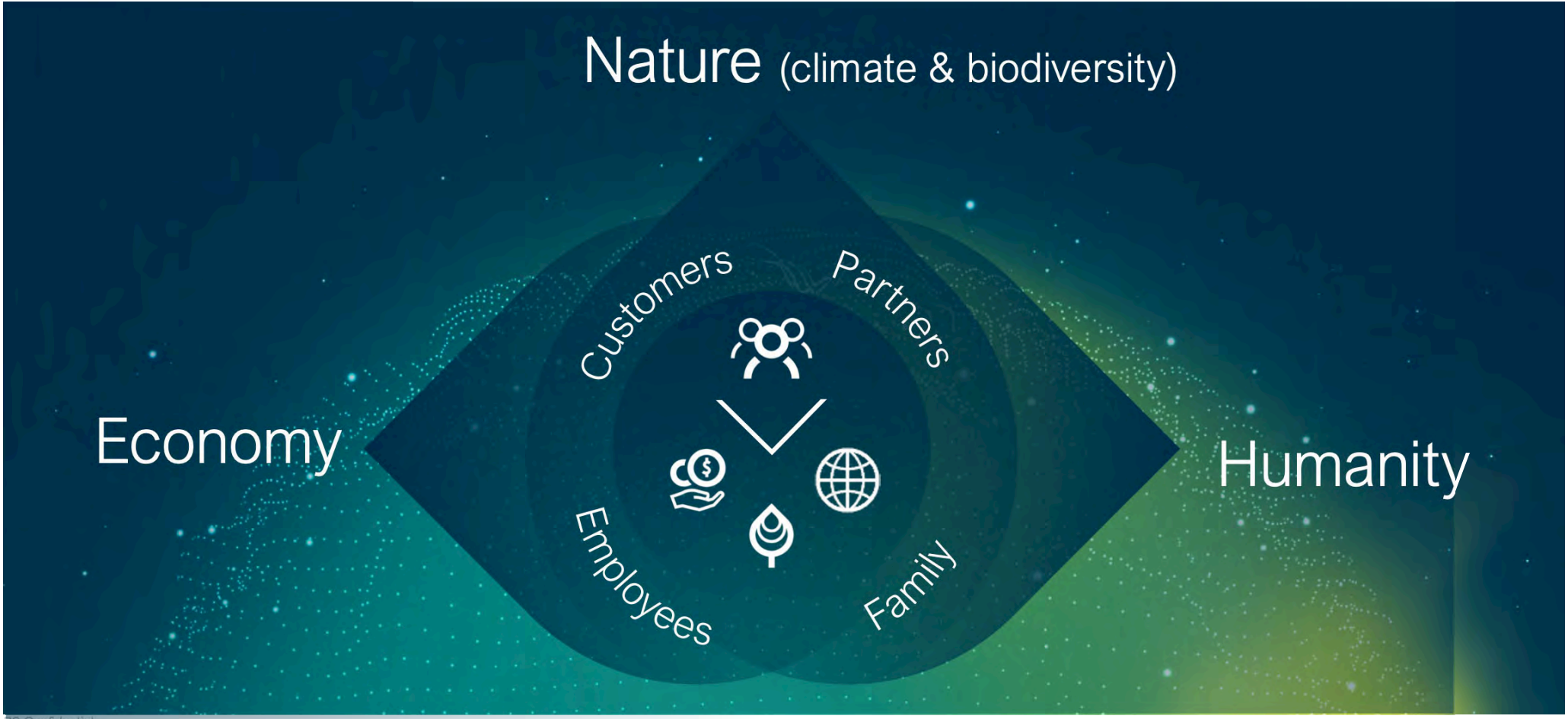
Walmart

VOLVO

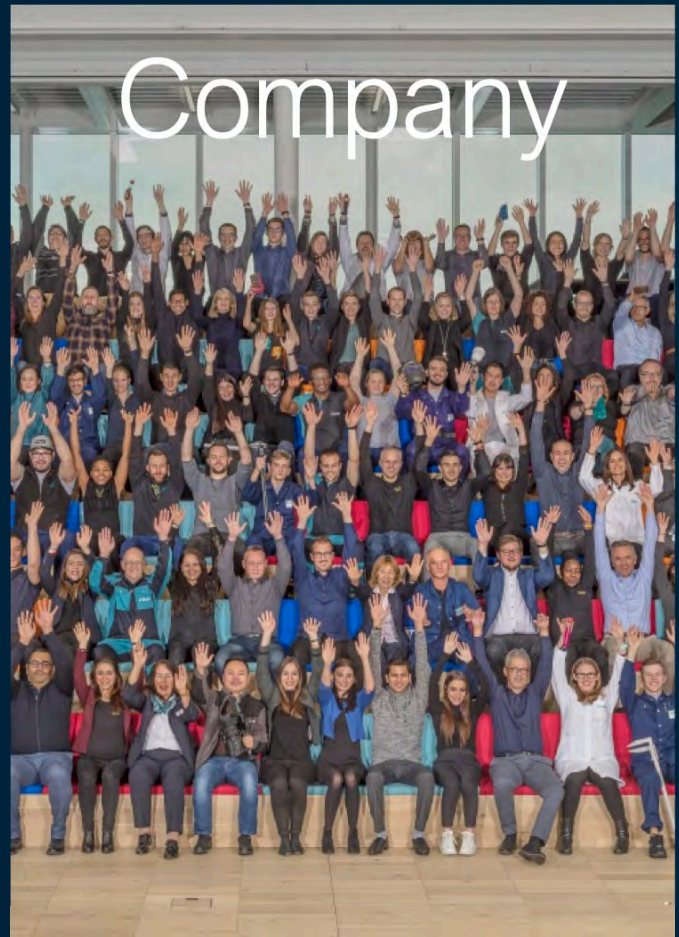
SAINT-GOBAIN

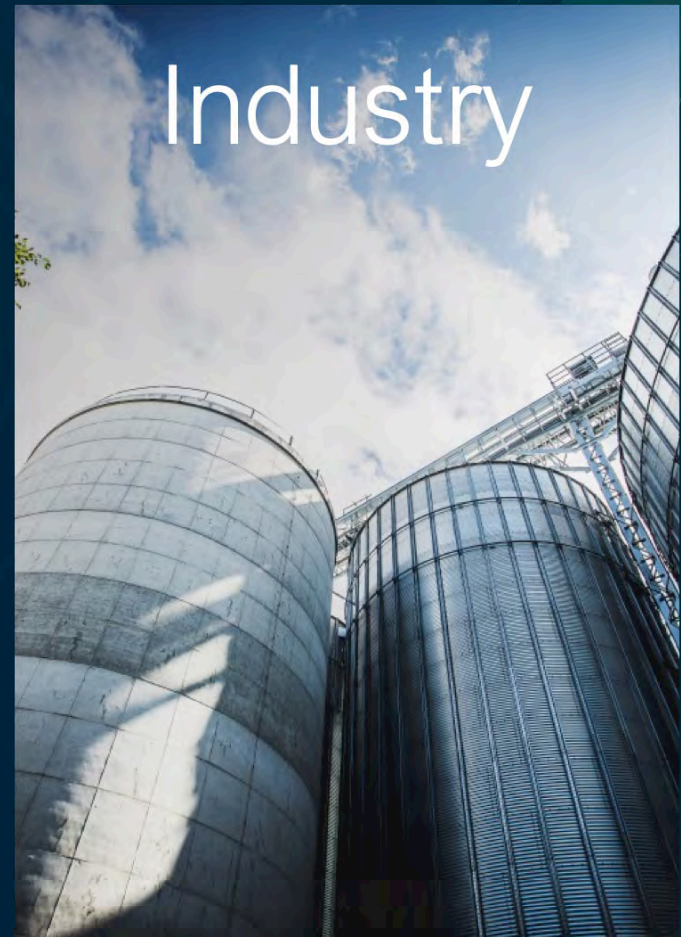
Our Sustainability Commitment

Balancing the needs of economy, humanity, and nature in every decision



Are we doing enough as an …





What can I do as individual?

Measure your carbon footprint to understand the impact you have on this planet

WWF Fussabdruck Rechner Deutschland

Engage as Bühler volunteers with PFS to create impact for food security & affordable nutrition in Africa

PARTNERS IN FOOD SOLUTIONS
Connecting Expertise with Opportunity

General Mills · Cargill · DSM · BÜHLER · HERSHEY · Ardent Mills · THE J.M. SMUCKER Co

Impact created by Bühler volunteers

84
Total activities supported

68
#Engaged Bühler volunteers

1'821
#Total Hours contributed

$251'298
Value of hours

52
#of clients served by Bühler employees

11
By country

$2'089'317
$ Value of new investments

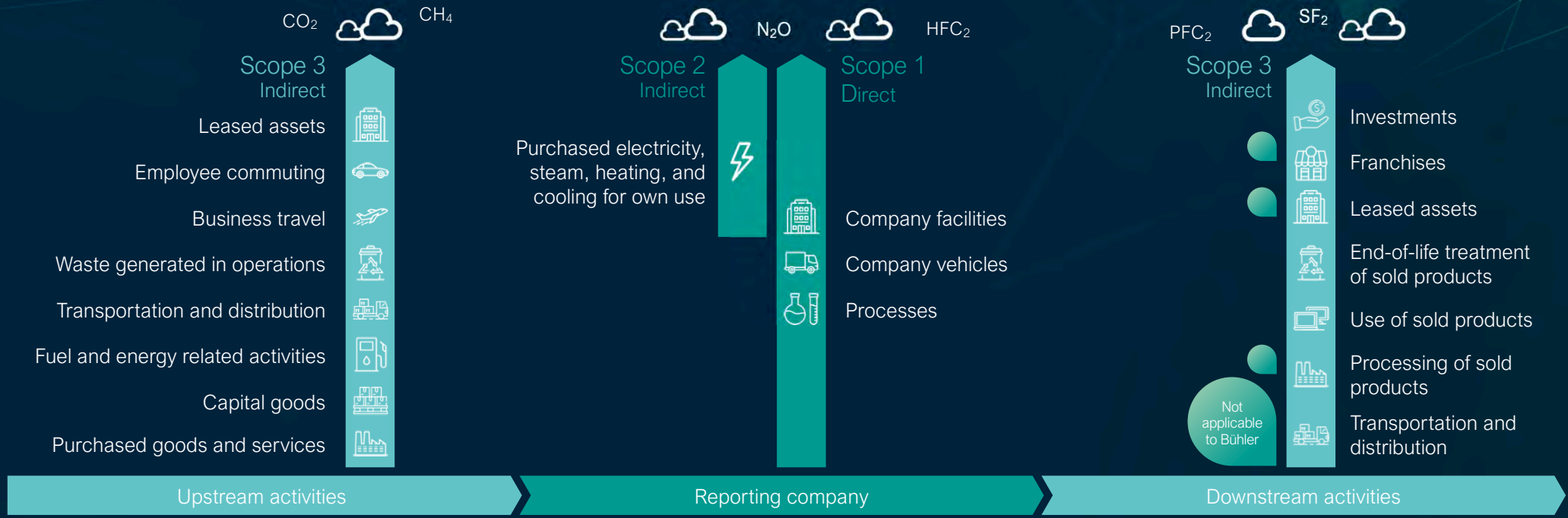
28%
% of Clients owned/managed by women

5.9 Billion
# of nutritious meal servings produced

Bühler's CO_2e emissions amount to 43 million tons/year
Baseline 2019

What can we do as a company?

Scope 3 up & downstream "Purchased goods" & "logistics"	Scope 1 & 2	Scope 3 downstream "Use of sold good"
1,030 k	100 k	42 million



Our commitments as a company

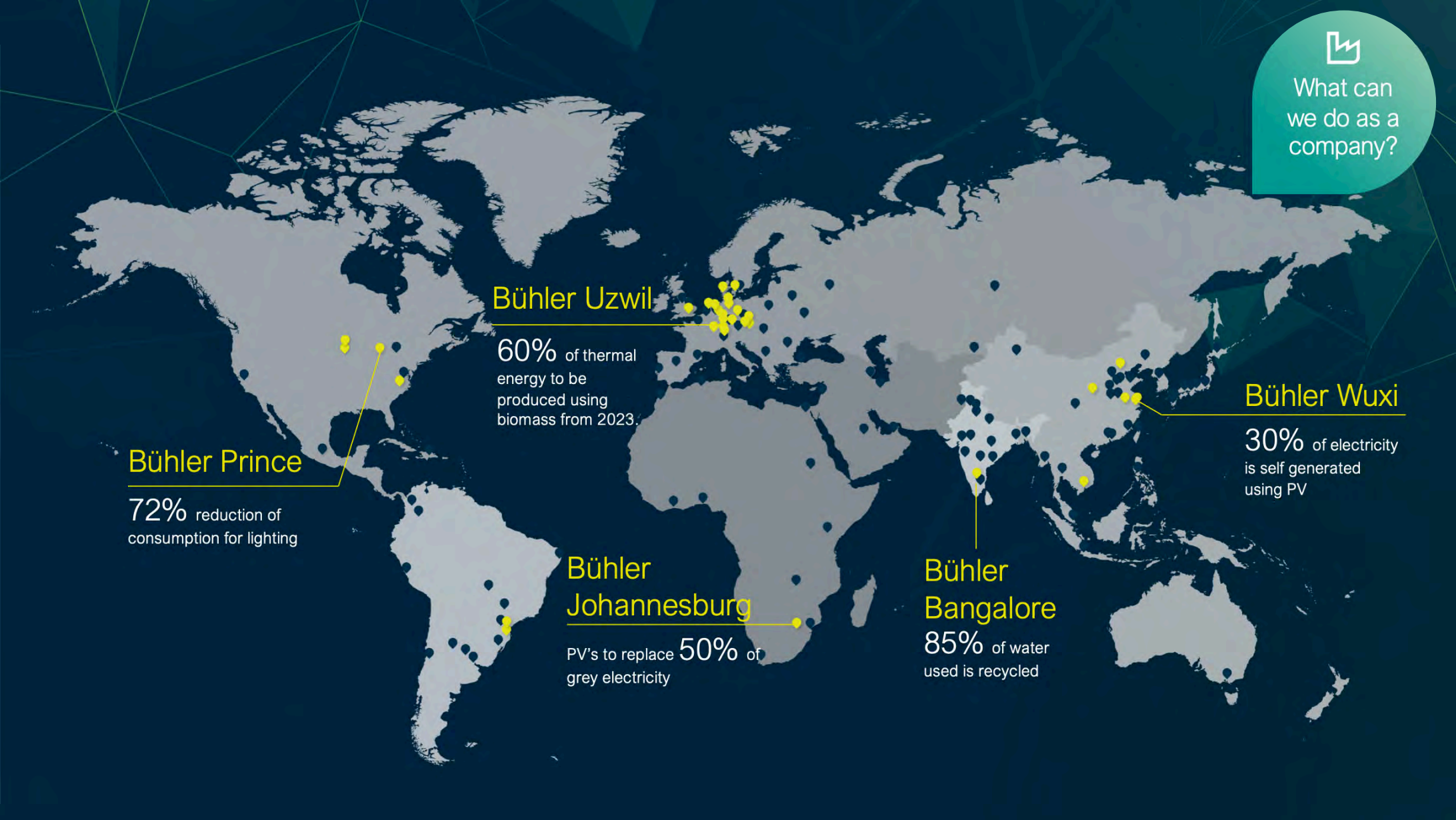
What can we do as a company?

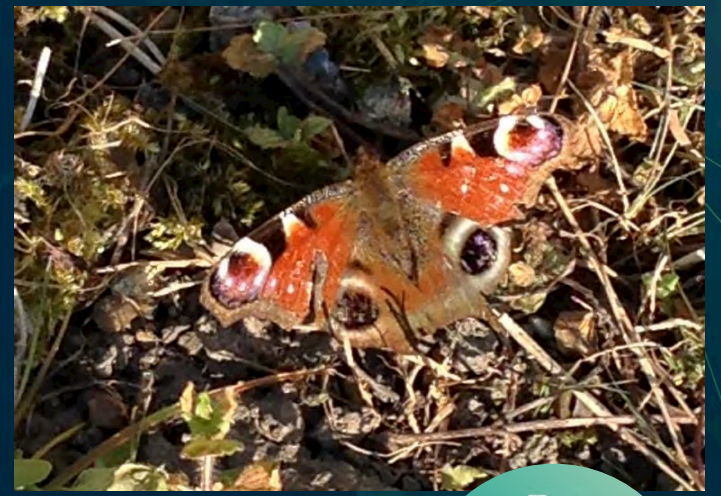
We commit to 60 % reduction of greenhouse gas emissions in our operations by 2030.

(Scope 1 & 2, 2019 baseline).

We proactively collaborate with suppliers to reduce climate impacts throughout the value chain

(Scope 3: purchased goods & logistics)


What can we do as a company?
Bühler Uzwil
60% of thermal energy to be produced using biomass from 2023.
Bühler Prince
72% reduction of consumption for lighting
Bühler Johannesburg
PV's to replace 50% of grey electricity
Bühler Bangalore
85% of water used is recycled
Bühler Wuxi
30% of electricity is self generated using PV



We are committed to protect and restore biodiversity

Gen B taking action in Bühler London – every m^2 counts

What can we do as a company?

Our objective is to support our customers on their net zero journey

What can we do as an industry?

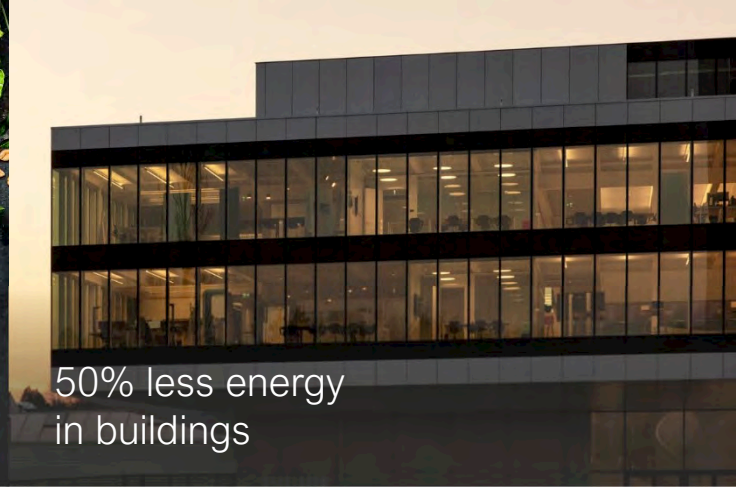
We support our industry to measure and reduce greenhouse gas emissions following science-based targets

We have the solutions ready by 2025, to enable 50% reduction in waste, energy and water in our customers' value chains

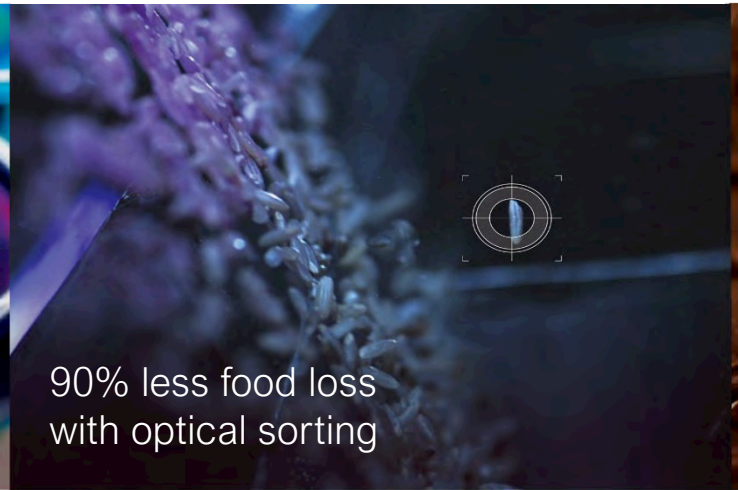
50%

Our commitment 50% less

With solutions already available and more for 2025…



Constantly improving resource efficiency



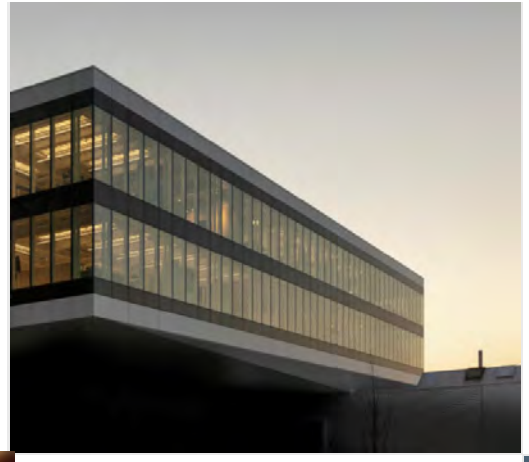
Example of solutions supporting our customers to reduce their emissions

Scope 1 or 2 of our customer	Scope 3 downstream of our customer	Avoided emissions by enabling category shift

Solano S Nut Roaster

-50 %

Up to 50 % less energy per kg of product



Plant-based meat

20 x

Up to 20 times lower CO2e emissions per kg of product compared to beef

Mill E3

-10% energy

+ 3% yield

processing of 135'000 t wheat/y saves **1,100 tonnes CO2e**/ year

Leybold optics glass coater

46%

Up to 46% reductions of heating and cooling energy in buildings

We quantify the impact of all high-impact technologies & Services

- Technology: to focus R&D & quantify impact & reductions of energy, waste & water
- Plant: to quantify the impact for our customers & support their sustainability journey
- Value Chain: to define the impact of technology & services across the value chain

Impact

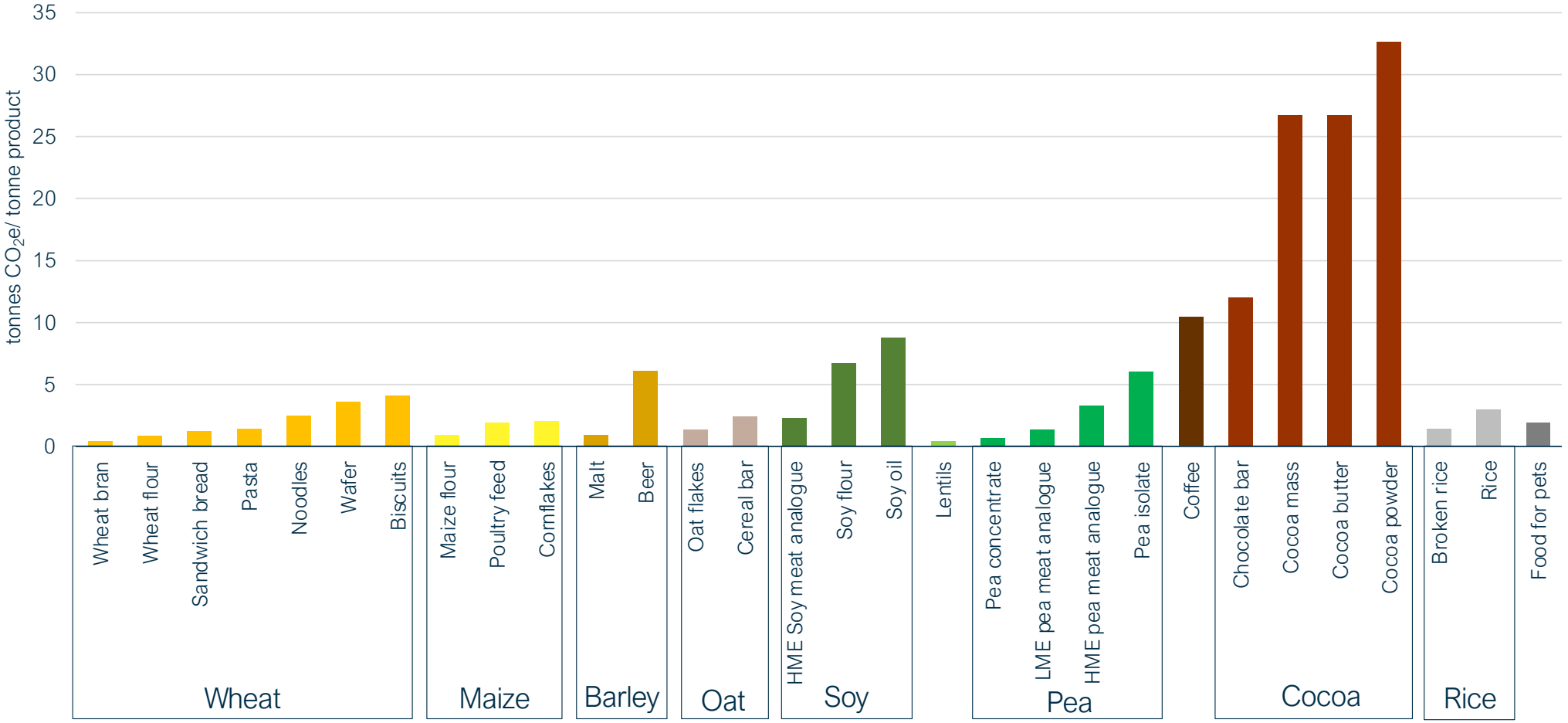
Raw Materials	BÜHLER Manufacture	Distribution / Retail	Consumer Use	Disposal / Recycling

Key Drivers of environmental Footprint:

- Raw materials (& therefore yield)
- Grinding, drying & heating (& therefore heat recovery)
- Transport distances & methods
- Waste (& therefore valorising side streams)

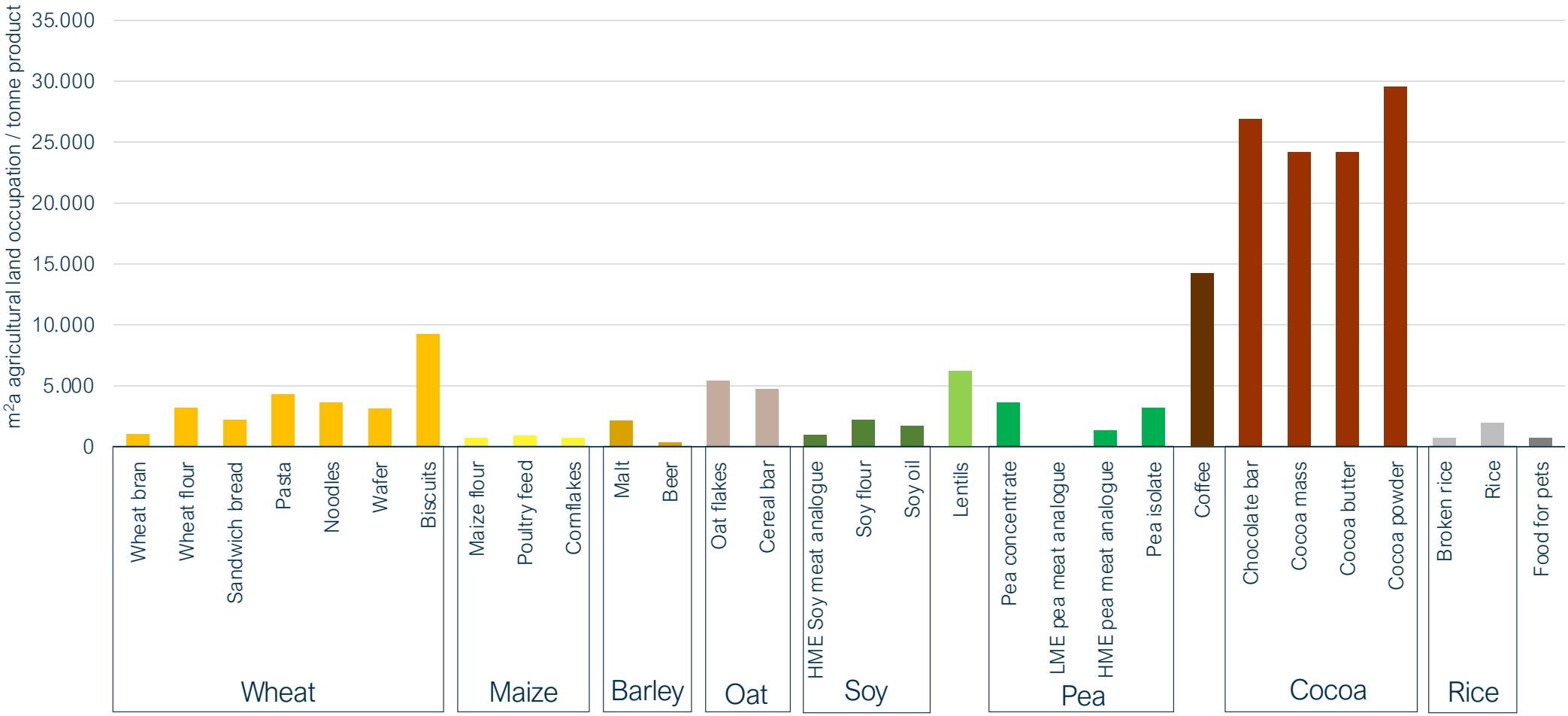
CO_2e Footprint of the key food and feed products

CO_2e is a unit of measurement that is used to standardize the climate effects of various greenhouse gases (such as methane, nitrous oxide etc.)



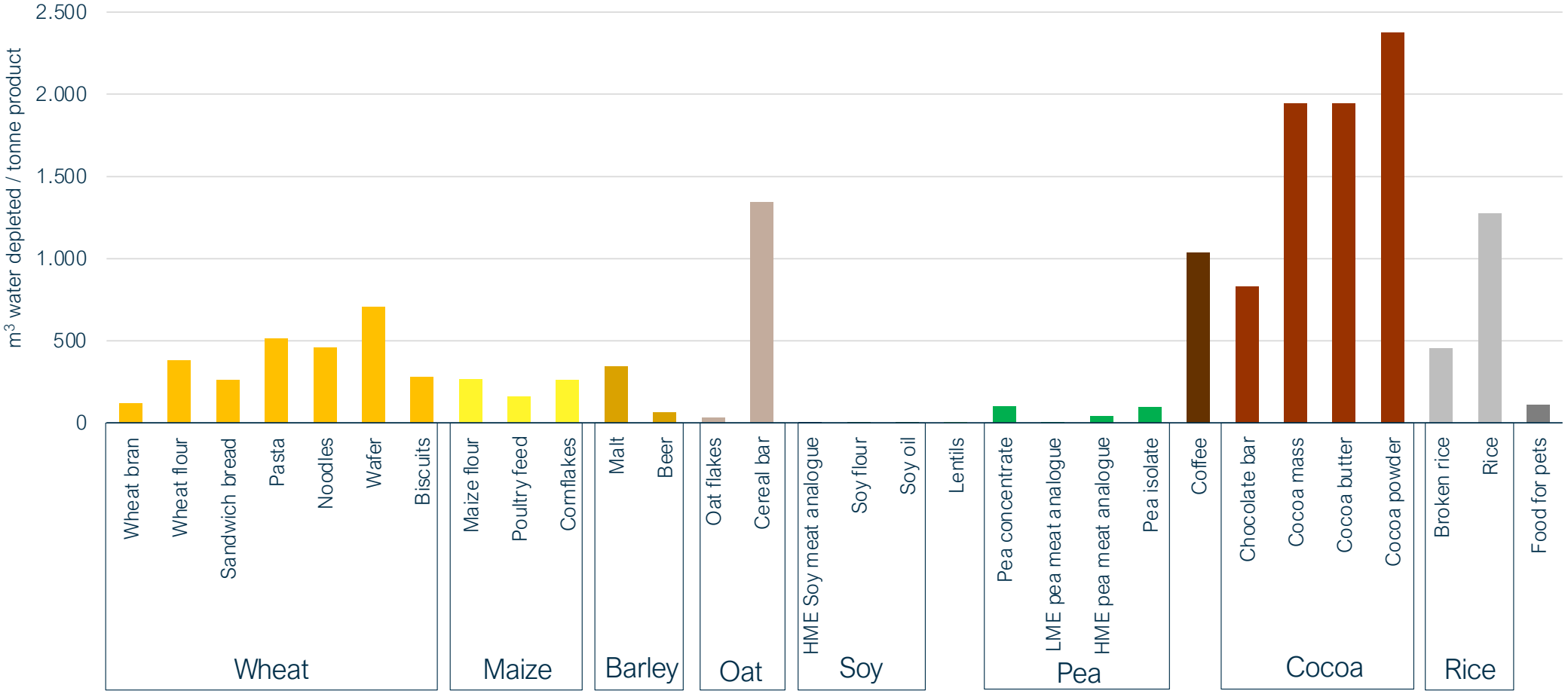
Agricultural land occupation of the key food and feed products

Agricultural land occupation is the use of land per year for planting, growing, cultivating and harvesting of crops.



Water depletion of the key food and feed products

Water depletion is the use of water for planting, growing, cultivating and harvesting of crops that exceeds the renewability rate.



We track our reductions in:

And quantify our impact on:

GHG

CO2e emissions

(kg CO2e / t)

Water depletion

(m^3 / t)

Agricultural land use

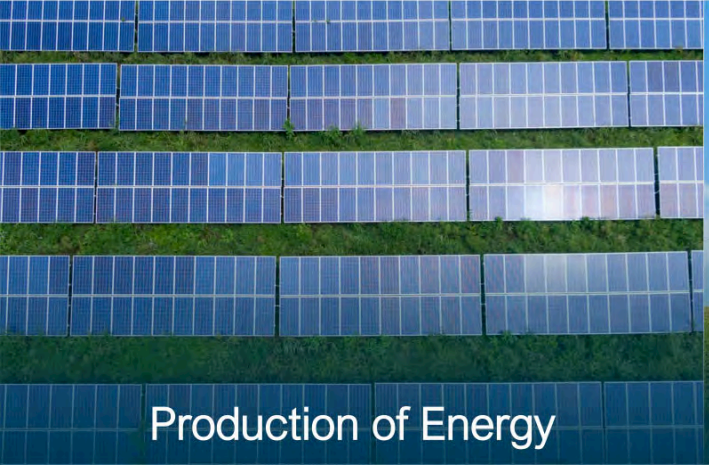
(m^2a / t)

CIRCULAR ECONOMY

SUSTAINABLE DEVELOPMENT GOALS

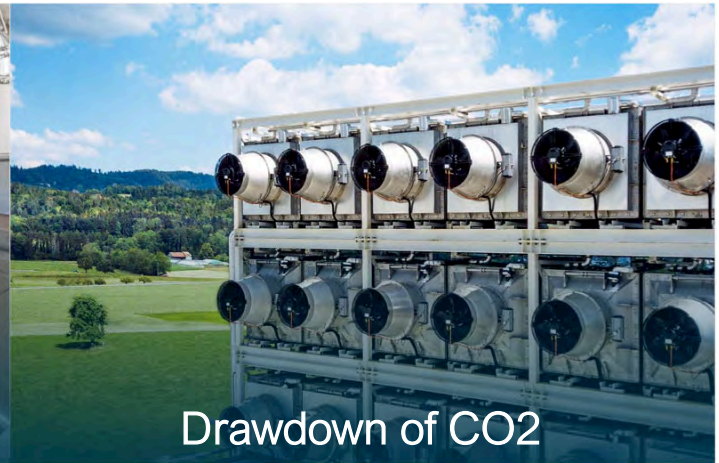
Qualitative

Bühler Environmental Quantification Services



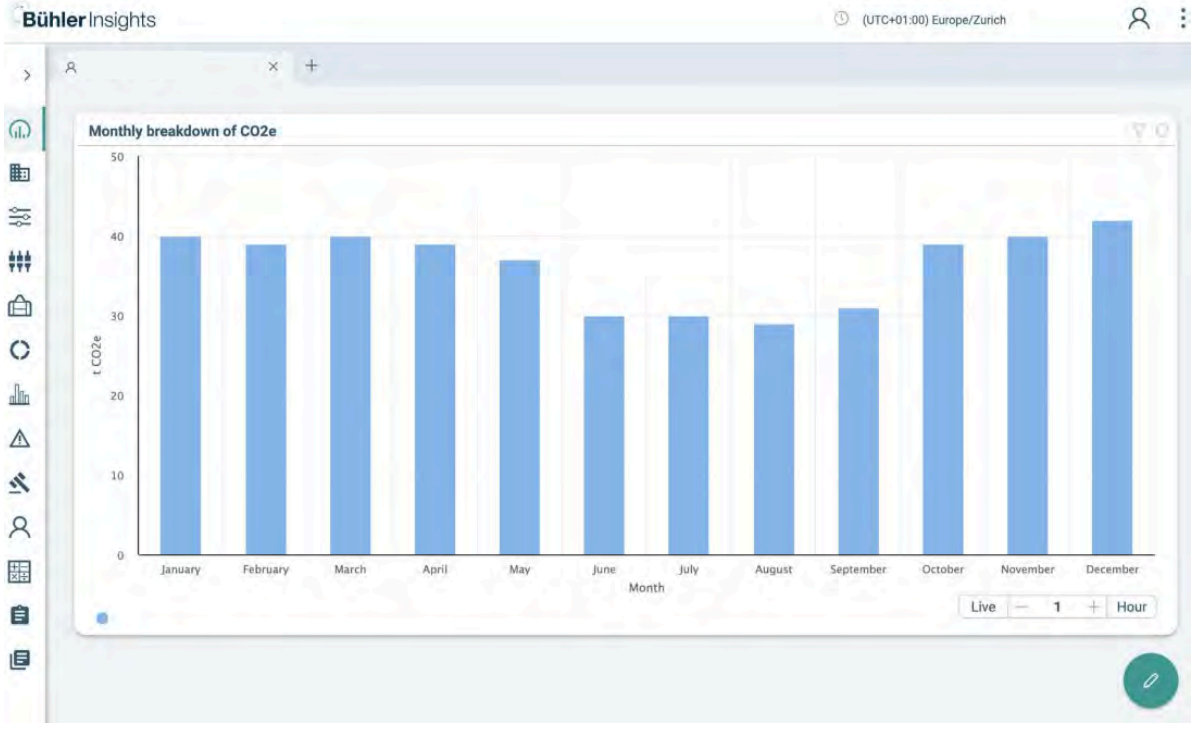
Where to start?

Setting environmental targets & achieving them is complex



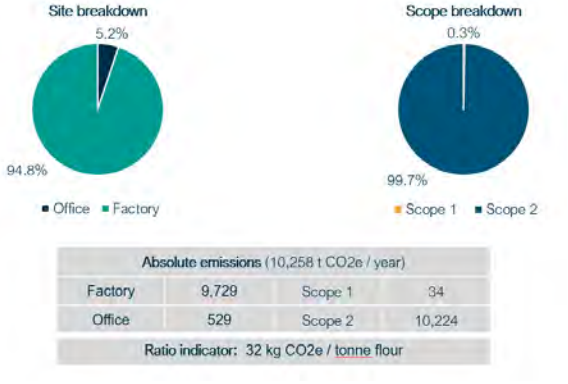
We *simplify* your Sustainability journey

1. **Measure** your CO_2eq footprint across all scopes in the Greenhouse Gas Protocol.
2. **Avoid** creating emissions with Bühler Energy Management & transparency in your value chain.
3. **Reduce** your footprint with informed decisions, comparing USD/Tonne CO2e reduced.
4. **Drawdown** residual emissions with credible partners to achieve your targets.
5. **Communicate** your results credibly.



Our Environmental Quantification Service: Measure & Understand

Site Assessments



Absolute emissions (10,258 t CO2e / year)			
Factory	9,729	Scope 1	34
Office	529	Scope 2	10,224
Ratio indicator: 32 kg CO2e / tonne flour			

- Quantify your site footprint in accordance with the Greenhouse Gas Protocol (all scopes available)
- Understand biggest levers to reduce company CO2 Footprint

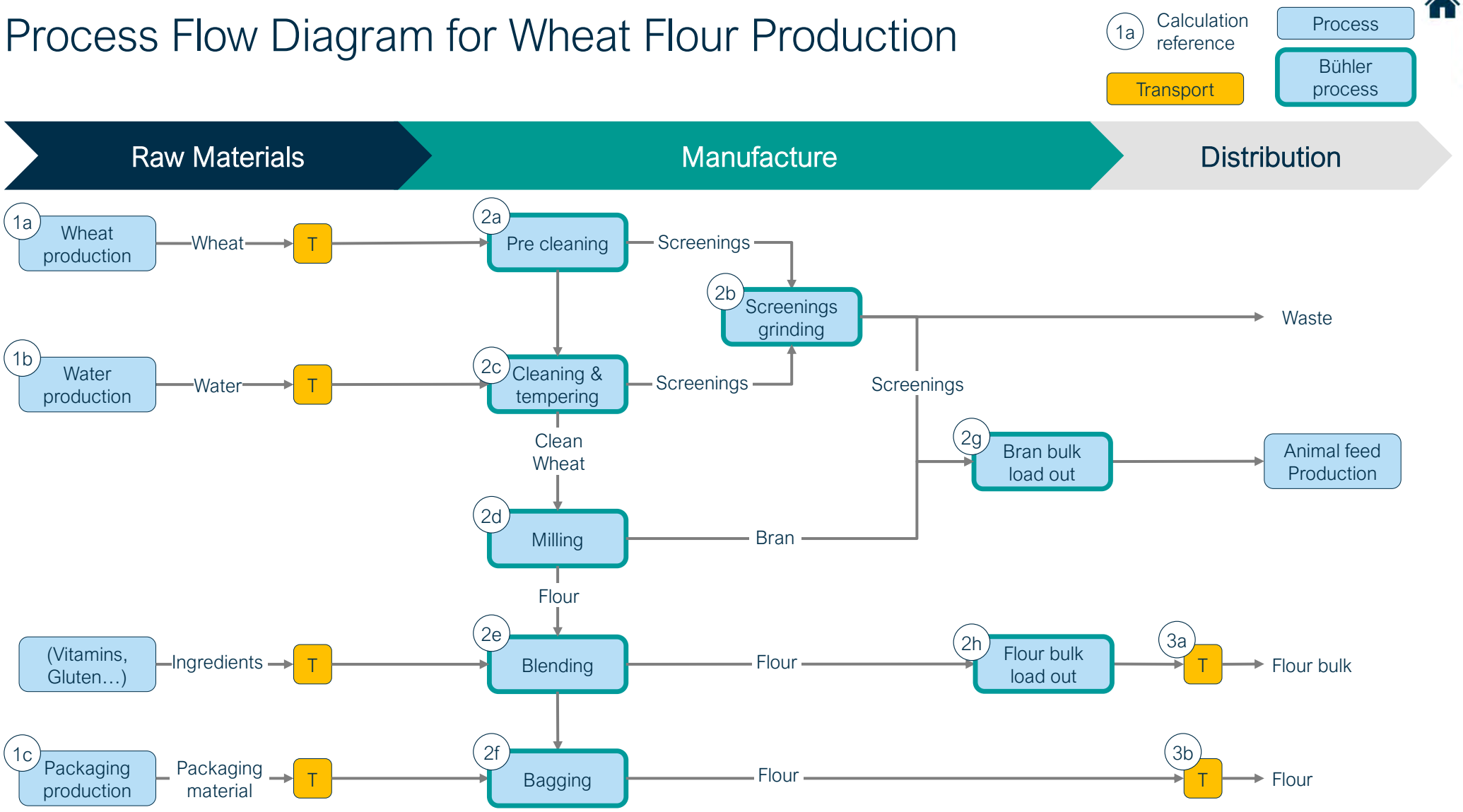
Product Assessments

- Quantify the CO2e of your product (other life-cycle metrics available)
- Engage your supply chain to communicate CO2e Footprint
- Understand biggest levers to reduce product CO2 Footprint

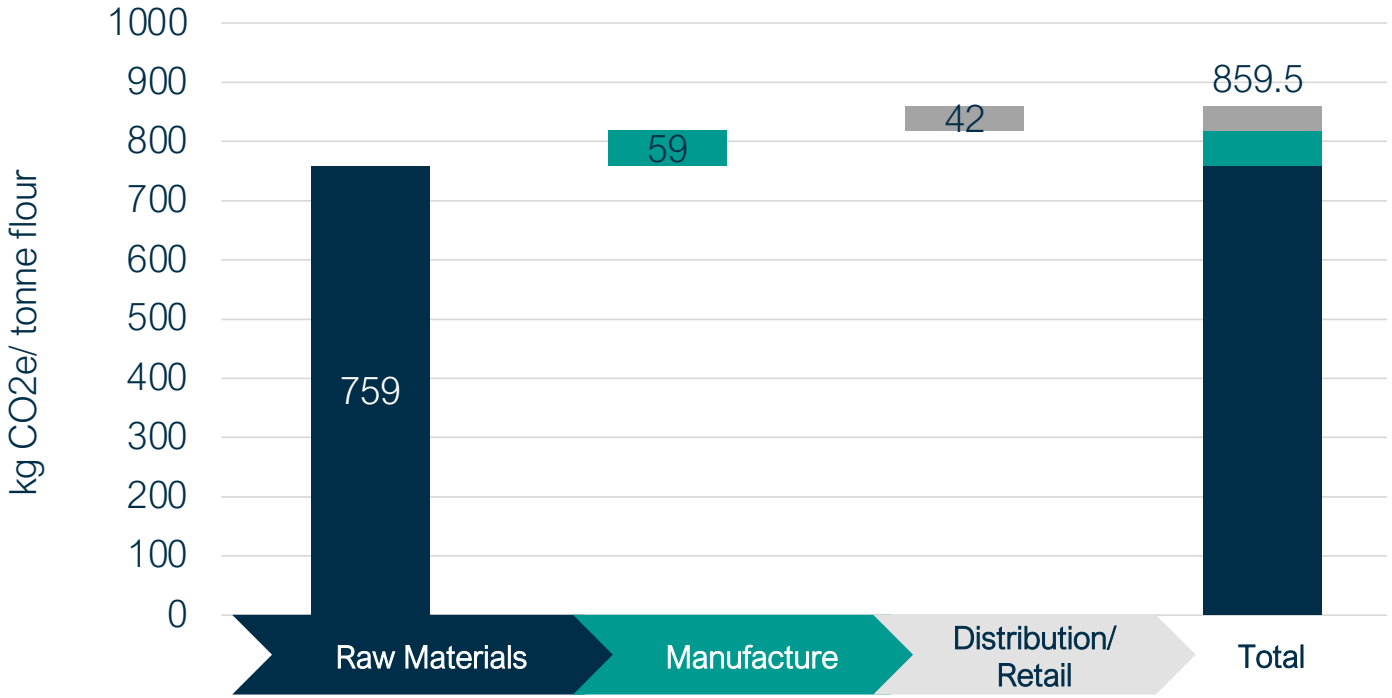
Certifications

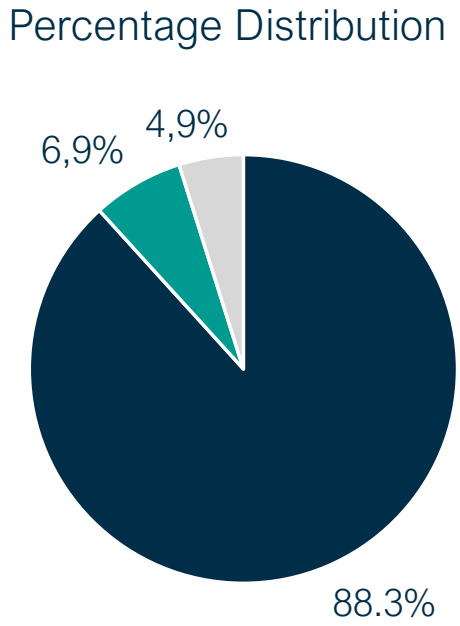
- Certify your quantifications to communicate results with confidence
- Demonstrate commitment to Sustainability

Process Flow Diagram for Wheat Flour Production



CO_2e Distribution of 1 tonne of Flour





Roller Mills and Services

Arrius

The integrated grinding system has an integrated drive unit consisting of motor and gear box that leads to energy savings up to 10% and improved grinding efficiency

ENERGY -10%

CO_2e -205* t/year

*based on a throughput of 135,000 tonnes per year

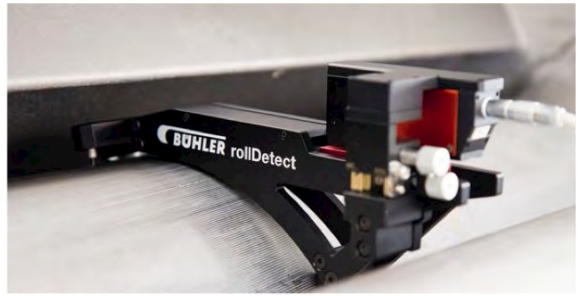
TVM

Through Temperature and Vibration Management constant product quality is obtained minimizing energy consumption and critical operation condition can be detected.

ENERGY -12%

CO_2e -246* t/year

*based on a throughput of 135,000 tonnes per year



Roll Detector

Refurbishing and or replacing rolls to ensure their optimal performance leads to up to 1% yield increase.

CIRCULAR ECONOMY through yield increase

ENERGY -8.2%

CO_2e -60* t/year

*based on a throughput of 135,000 tonnes per year

Cleaning and Sifting Solutions

Sortex H

The Latest-generation H SpectraVision machine reduces false reject by 30% compared to the A machine, generating more yield when set for same quality final product.

CIRCULAR ECONOMY

through yield increase

WASTE

-50%*

CO_2e

-649** t/year

*more raw material production
**based on a throughput of 135,000 tonnes per year

Vitaris

Modular system with minimum space requirements that ensures high product quality.

Azurit

Digitalized sifter with 10-15% lower installation costs.

ENERGY

-13%

CO_2e

-1.3* t/year

*based on a throughput of 65,000 tonnes per year

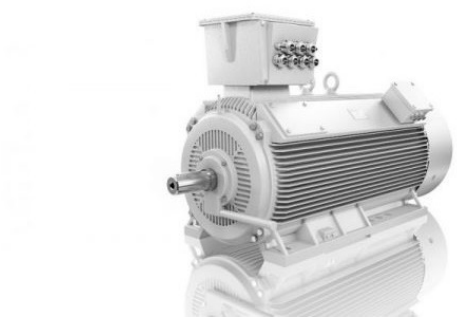
Tailored action plan example
700 tCO2e/year saving potential

Machine layout & use

- Aggregate processes, increase machine size & reducing machines
- Upgrading material conveying (blow lines to chain conveyors)
- Replace old equipment (gear transmission to belt transmission)

Optimize Air use

- Install frequency converters & reduce air speed for (Pneumatic conveying, Air rinsing & Aspiration)
- Minimise air leakages
- Improve pipe layouts & reduce bends



Power supply & motors

- Ensure motors operate >60% load
- Install most efficient transformers

1000 MWh/a saving potential | 120 K USD/a saving | ROI between 0.5 – 4.4 years

*Assumptions: Global emission factor for electricity: 0.763 kg CO2e / kWh, Energy cost: 0.12 c / kWh, 350 000 Tonnes processed

CO_2e quantification for HEMELTER MÜHLE FAM. CORDESMEYER

We supported Hemelter Mühle on:

- Quantified **product CO_2e footprints** of flour & bran from the farm, into wheat storage, wheat logistics, milling and flour logistics
- Provided a comparison of **different logistics methods** including lorry, rail and ship
- Quantified **site CO_2e footprint** of the Spelle site in Germany
- Impact analysis of **CO_2e neutrality** & purchase of renewable electricity

About Hemelter Mühle:
Hemelter Mühle has been a family-run milling company for over 128 years, and is managed by Jan Cordesmeyer in the fourth generation. Approximately 360'000 metric tons of wheat, rye, spelt are milled across the two sites in Rheine and Spelle.

The Bühler team provided us with extensive insight into the details and particulars of the calculation, so that the subsequent evaluations were always comprehensible and transparent for us as non-experts in this field. This enables us even today to answer our customers' questions about our results with ease.

Jan Cordesmeyer
CEO of Hemelter Mühle

CO_2e quantification for selectum

We supported Selectum by:

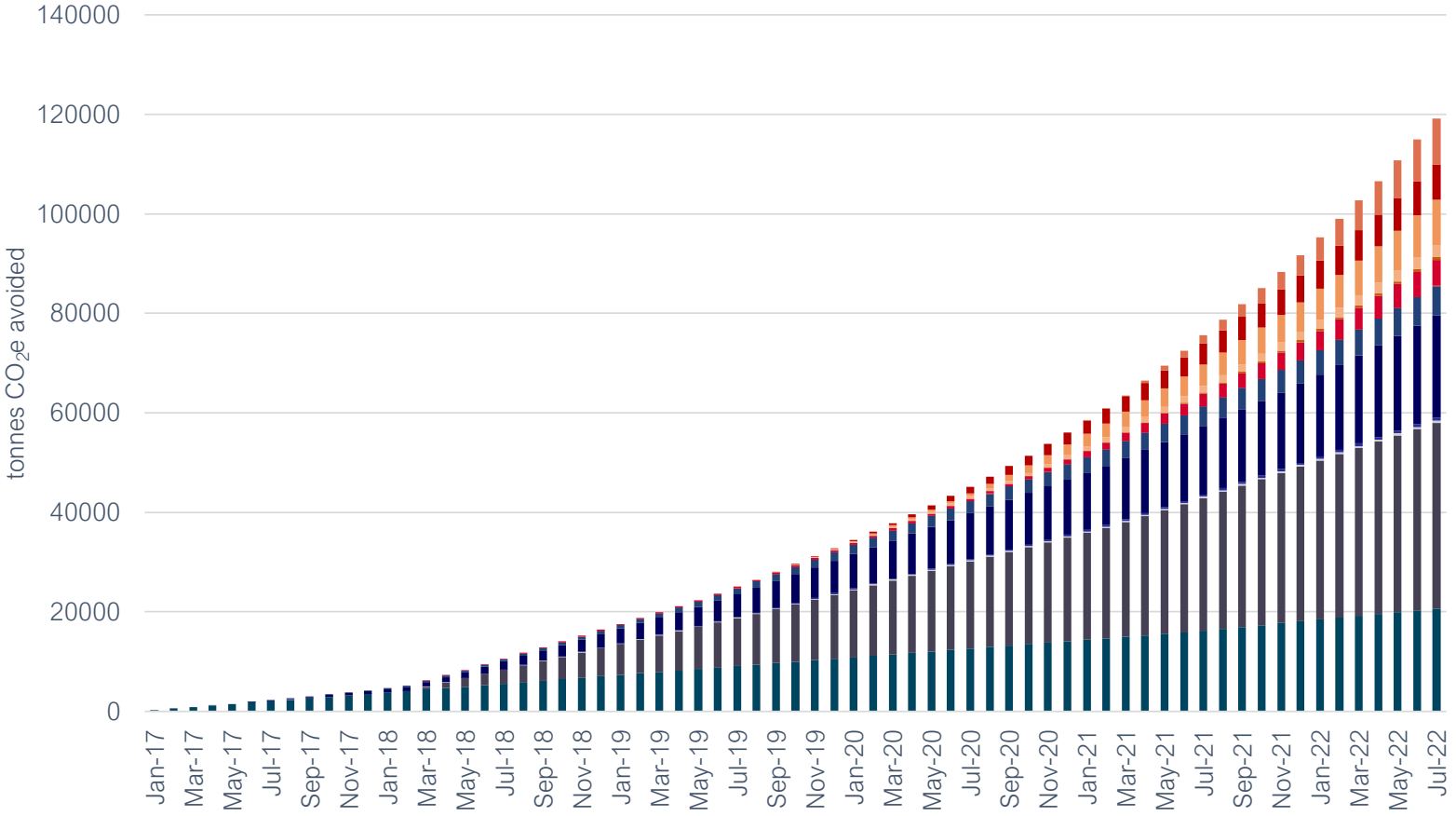
- Quantifying **Scope 1 & 2 emissions** of Paddies Snack production, to verify their production as **CO2e-neutral**
- Coordinating a **third-party certification (in-progress)** to enable a CO2e-neutral manufacturing claim
- **Transferring knowledge** on CO2e accounting to enable effective communication of their sustainability efforts

About Selectum:
Selectum is a snack manufacturer in Austria, producing mainly cream-filled wafer snacks. On top of improving the nutritional quality (3 times more protein and fibre, 40% less fat compared to e.g. chips), they are focused on environmentally friendly production using Bühler's inductive baking oven EWB-IND, eliminating fossil fuels in the baking process.

"The assessment and ongoing certification of our Scope 1 and 2 emissions performed by the Bühler team enable us to communicate our sustainability achievements credibly and effectively to our customers and to the final consumers, who show an increasing demand for transparent and sustainable snacks. This way, our customers who put their trust in us, such as the Biogena Group from Austria, for who we produce immune boosting snacks, can benefit from our sustainable production as well"

Camilo Wolff
Founder of Selectum GmbH

High-Impact Technologies & Services Avoided CO_2e* Benchmarked against Bühler solutions pre-2017



Technologies & Services Currently Tracked (total # of lines**)

Services
- Smart Mill 2021 & 2022 (38)
- Smart Mill - 2019 & 2020 (24)
- DryMate (11)
- Silo Monitoring (6)
- Mont Blanc (3)
- MoisturePro (2)
- QuaLiB (1)

Technologies
- MacroMedia + MicroMedia (57)
- Continuous Slurry Mixer (13)
- SWAKT-ECO (11)
- EWB-IND (11)
- JetMix (9)
- Prime Masa (2)
- Mill E3 (2)

**A line takes a raw material through all processing steps to transform it into the final product

*Starting to track when in operation. Avoided CO_2e defined as CO_2e not released to the atmosphere in the raw material & manufacture life cycle stages due to savings along the value chain.

INNOVATIONS FOR A BETTER WORLD