The True Value of your Food

Reference guide to CEO read

Background material to provide additional context

August 2021

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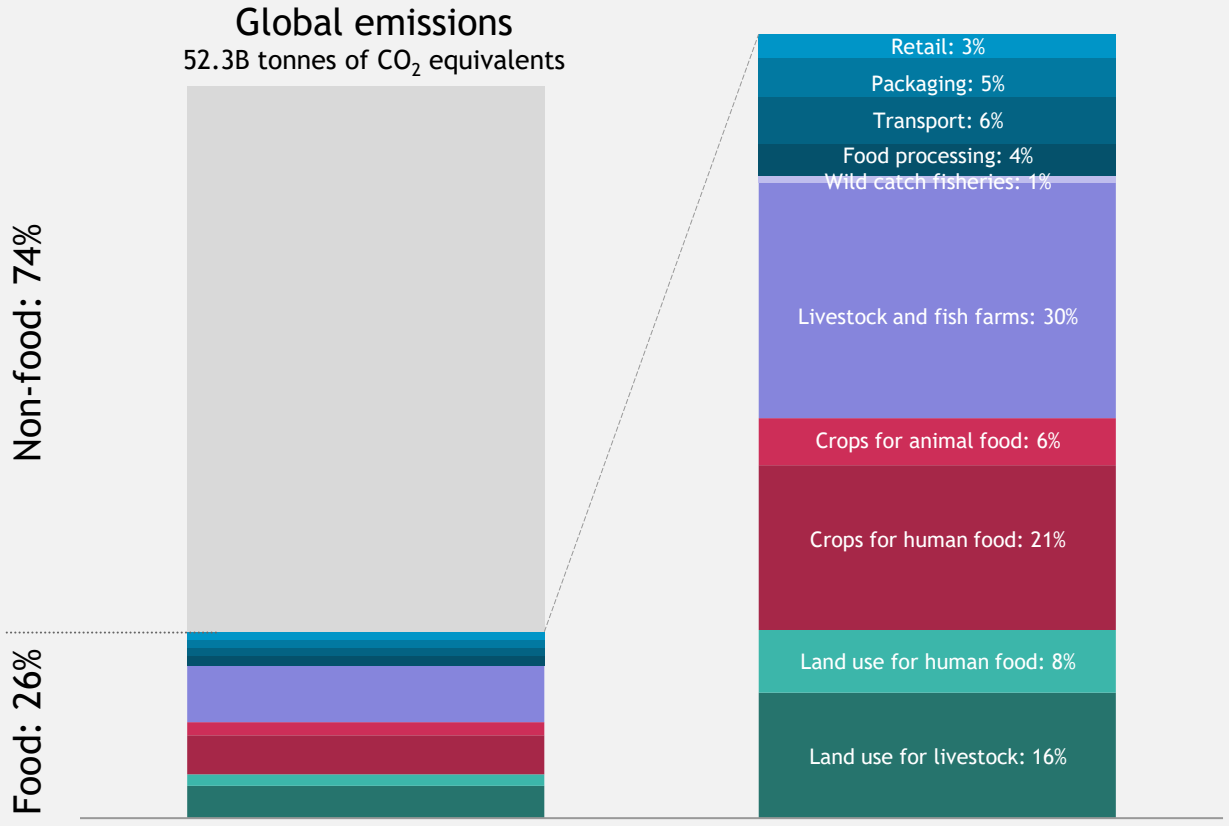
wbcsd

- Relationship between food system, population and climate
- External pressures towards sustainable food
- Approaching TVoF for a cookie
- Case studies
- Three-step action plan

Our food system is responsible for 26% of the global greenhouse gas emissions impacting climate change

Global GHG emissions from food production



Supply chain 18%

Livestock and fisheries 31%

- Methane from cattle's digestion ("enteric fermentation")
- Emissions from manure management
- Emissions from pasture management
- Fuel use from fisheries

Crop production 27%

Land use 24%

- Land use change: 18%
- Cultivated organic soils: 4%
- Savannah burning: 2%

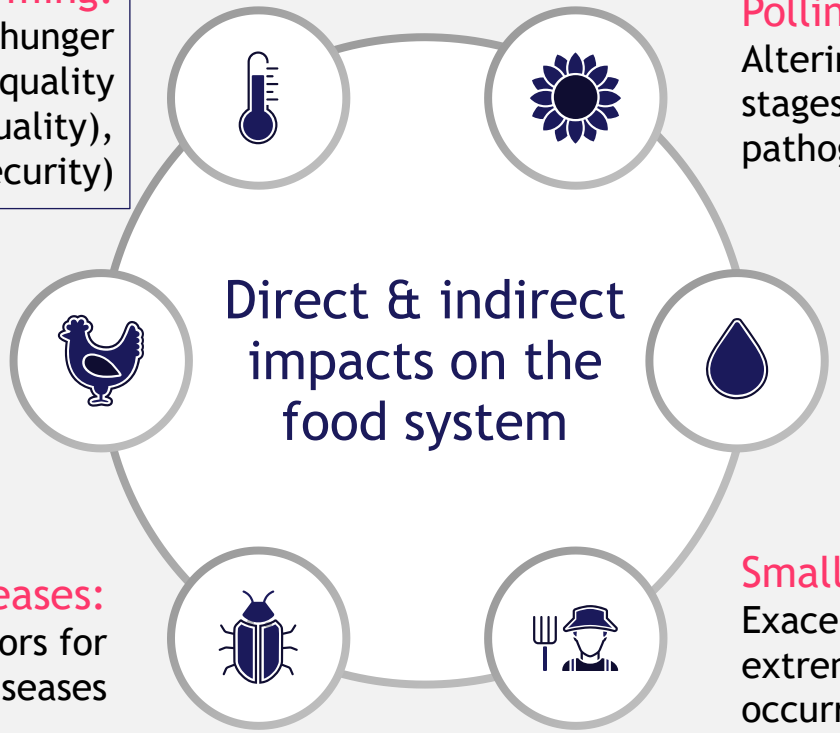
Source: Joseph Poore and Thomas Nemecek (2018). Reducing food's environmental impacts through producers and consumers. Published in Science.
OurWorldinData.org; licensed under CC-BY by the author Hannah Ritchie

Climate change is impacting the food system through various channels

Overall impact from global warming:
Altering food access (prices, impacting hunger and land use), utilization (food safety), quality (crop productivity and nutritional quality), stability (food insecurity)

Livestock production systems:
Lower animal growth rates and productivity, damaged reproductive functions, increased pests and diseases, and loss of biodiversity

Pests and diseases:
Altering pests, diseases, and vectors for both crop and livestock diseases



Pollinators:
Altering pollinator ranges, timing of growth stages, distribution and virulence of pathogens affecting pollinators

Aquaculture[1]:
Loss of production or infrastructure due to extreme events, increased risk of diseases, toxic algae and parasites; scarcity of wild seed, limited access to freshwater for farming

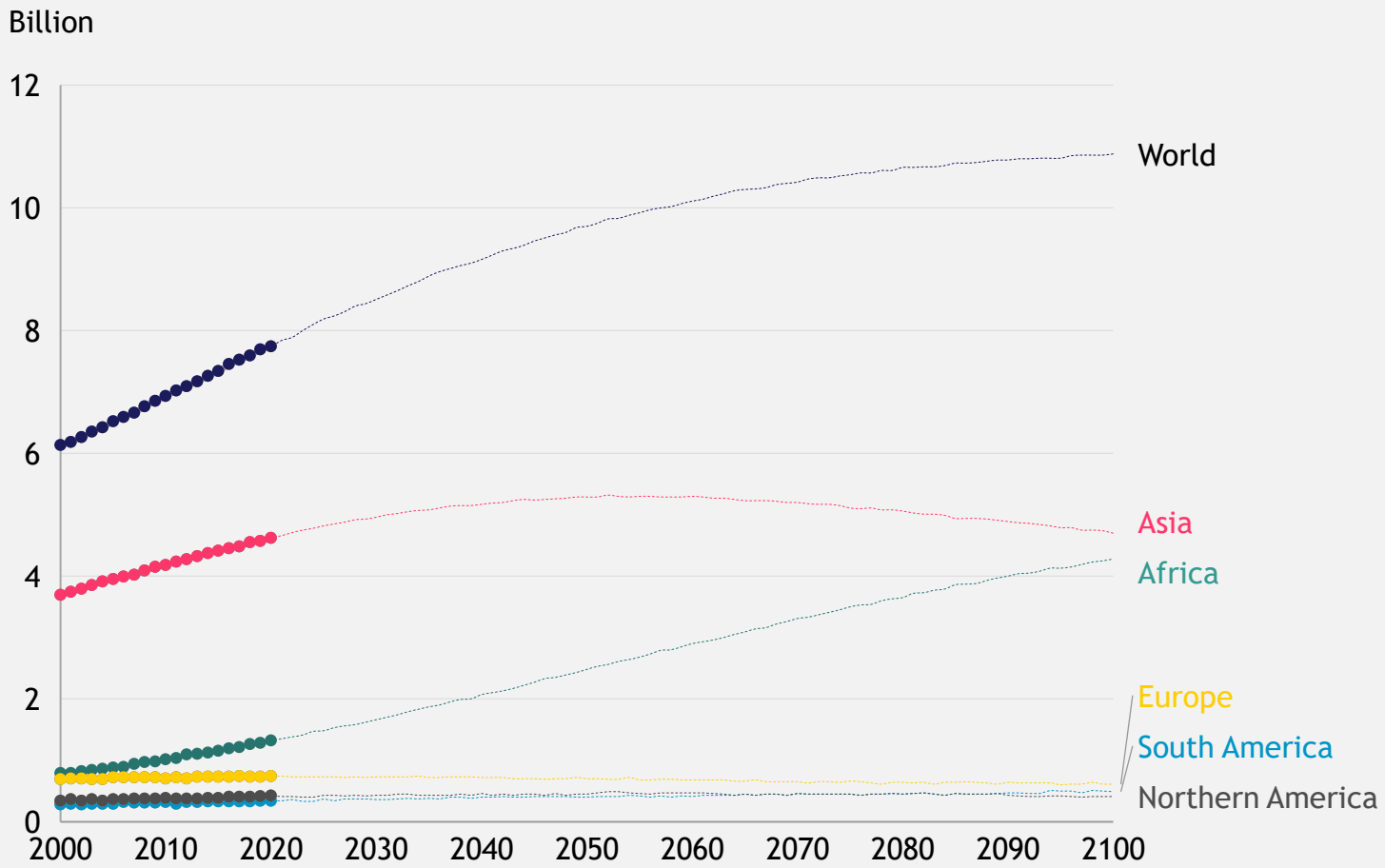
Smallholder farming systems:
Exacerbated risks of pests and diseases and extreme weather events; increasing occurrence of chronic food insecurity

1. Land-based aquaculture; Source: Climate Change and Land (IPCC Special Report)

Global population is expected to grow until the year 2100, reaching a population of 10.9 BLN people

Global population expected to grow to 9.2 billion by 2030; peak to be reached in 2100

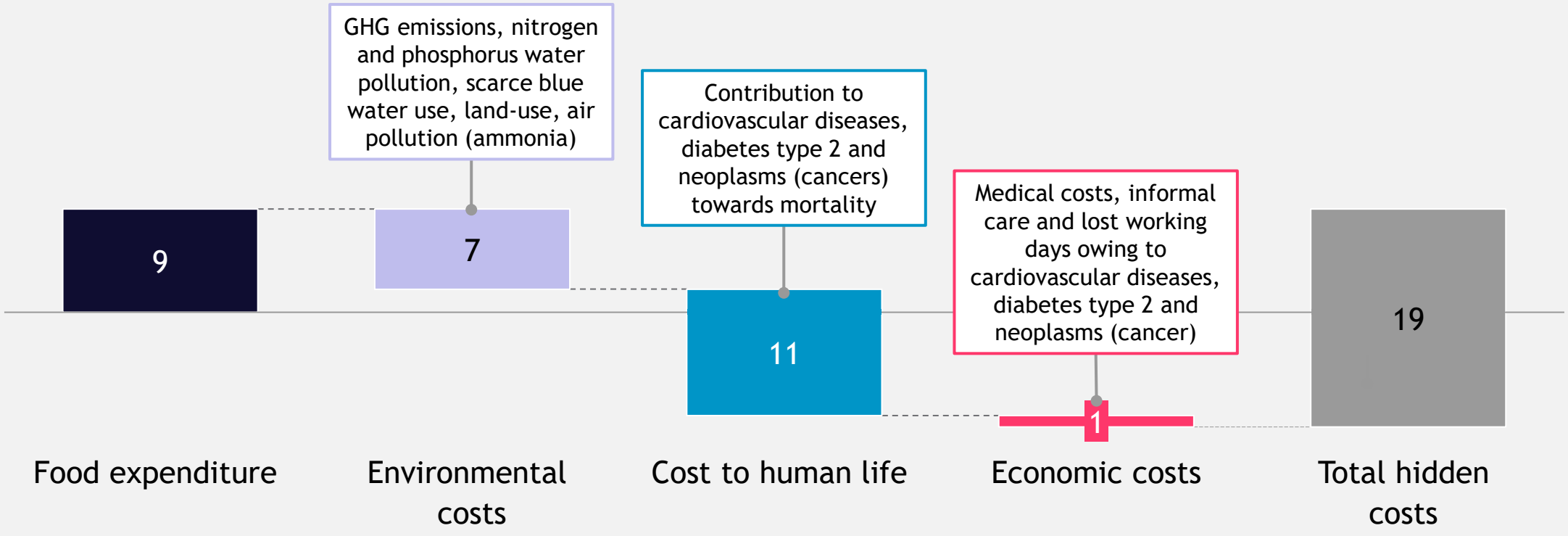
Population of all world regions, including the UN projection until 2100



Source: UN – Population Division (2019 revision); OurWorldinData.org

Today, total "hidden costs" of the global food system are estimated at ~USD 19 trillion

Annual food expenditure and hidden costs of global food system in USD trillion (2021)



Source: The True Cost and True Price of Food by Scientific Group of UN FSS, 2021

Relationship between food system, population and climate

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Consumers driving a higher demand for sustainably sourced products

Consumers are willing to pay more for sustainable products

41% of global consumers are willing to pay more for organic / all-natural ingredients

74% of global consumers are willing to pay more for sustainable packaging

… with differences across geographies

US

65% of consumers look for products that can help them live a more sustainable and socially responsible life

1/2 of consumers try to purchase products or services from brands that take a stand on social or environmental issues

EU

2/3 of consumers buy products and services from companies that are socially and/or environ-mentally engaged

43% of consumers tend to purchase products and services from high-purpose brands relatively more often

Africa

62% of consumers look for products that can help them live a healthier diet

48% of consumers describe their diet as somewhat vegan, flexitarian

ASEAN

66% of consumers feel personally affected by environmental problems (compared to 46%, globally)

+5% additional Eco Considerers[1] among consumers in 2020 compared to 2019 (led by Indonesia, with growth from 11% to 22%)

LATAM

68% of consumers use meatless meals at least once a week in Mexico (72% in Argentina; compared to 63%, globally)

1. People who take "some action" to reduce their environmental impact, e.g., using reusable shopping bags; but less frequently than Eco Actives

Source: Nielsen IQ estimation (2021); Trivium Packaging - Global Buying Green report (2020); Kantar – Who cares; who does (2020); HealthFocus International, Global Plant Report (2019); BCG Analysis

Around the world, regulations to address externalities are implemented; the EU is leading food system transformation with Farm to Fork Strategy

Non-exhaustive

Overarching

- Farm to Fork Strategy to make food systems fair, healthy & environmentally-friendly (EU)
- Policy for alternative agriculture to drive environmentally & socially sustainable framing practices (Cuba)

Health

- Tax on sugar-sweetened beverages (>40 counties)
- Limitation of trans-fat in food (>20 countries)
- Fortification of staple foods with essential micronutrient (124 countries globally)
- Nutri-Score on food packaging (7 countries pledged support)

Environmental

- Tax for CO_2e emissions (~40 countries globally)
- Territorial Use Rights in Fisheries, TURFs (~5 countries in Oceania)
- Environmental Land Mgmt system (UK) pays farmers for sustainable practice (e.g., CCS[1], restoring river bends)

Socio-economic

- Minimum wage (>170 countries globally)
- African Union Malabo Declaration[2] to achieve shared prosperity & improved livelihoods

1. CCS = Carbon Capture and Storage 2. Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods
Source: EU; Global Fortification Data Exchange; Global Panel on Agriculture and Food Systems for Nutrition; International Labour Organization; Obesity Evidence Hub; WHO; BCG analysis

Media increasingly report on the different hidden costs of food; environmental impact is reported most often

RealClear Science
The Truth about processed Foods' Environmental Impact
2021

USA TODAY
Coca-Cola, Pepsi highlight the 20 corporations producing the most ocean pollution
2019

REUTERS
Nutella maker fights back on palm oil after cancer risk study
2017

THE BUSINESS TIMES
US$940b food-waste problem has Walmart, Impossible Foods pledging to help
2020

The Guardian
Coke and Pepsi sued for creating a plastic pollution 'nuisance'
2020

FT FINANCIAL TIMES
Nestlé document says majority of its food portfolio is unhealthy
2021

TIME
Vegan Customer Sues Burger King for 'Contaminated' Impossible Whopper Allegedly Cooked on same Grills as Meat
2019

The Guardian
Revealed: UK supermarket and fast-food chicken linked to deforestation in Brazil
2020

Chicago Tribune
McDonald's under pressure to phase out antibiotics in beef, pork
2018

JUST FOOD
Nestle, Mars among chocolate giants facing slavery lawsuits in US
2021

FOOD DIVE
ADM agrees to pay $45M to settle price-fixing allegations in peanuts, WSJ reports
2021

Source: Press review

Examples of financial parties committed to financing nature and sustainable land use

Non-exhaustive

HSBC

Raised a $1 billion natural capital investment fund

- Focus on:
  - Coasts and forests restoration
  - Sustainable forest management and agriculture
  - Wildlife and biodiversity promotion
  - Carbon sequestration in marine and terrestrial habitats
  - If successful, a $2bn carbon credit fund will be launched as a follow-up
- Partnerships: with Pollination Group, a climate change advisory and investment firm

LOMBARD ODIER

$400 million circular bioeconomy fund that seek to harness the power of nature

- Focus on the circular bio-economy; resource efficiency; outcome-orientated consumption; and zero waste
- Possible investment universe of about 500 companies for the new fund, with market capitalizations of between $1 and $20 billion
- Partnerships: 40-50 publicly listed companies within the small and mid-cap space across North America, Europe and Asia

Rabobank

Introduction of Sustainability Linked loan

- Fous on: Loans are being offered to companies that already have sustainability ambitions around food waste and preferably also measure it
- Tonnage of food produced or sold is compared with food waste and loss; companies that meet the targets get a lower interest rate, and underperformance is sanctioned
- Partnerships: N/A

Source: HSBC 2020 Annual report, Climate Finance Markets & The Real Economy,Bloomberg press review, Soil health institute reports, USDA Economic Research Service and National Agricultural Statistics Services, Rural and Ag Finance-state of the sector report, BCG Analysis

Relationship between food system, population and climate

External pressures towards sustainable food

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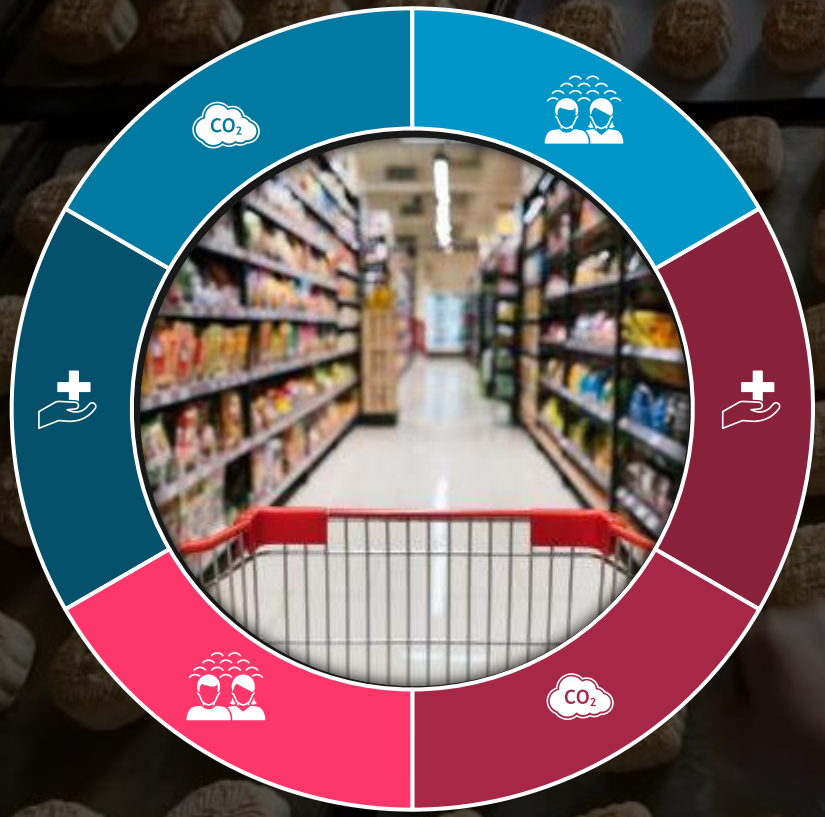
Case studies

Three-step action plan

The True Value is created by choices along the whole value chain of a product – from field to fork

True Value of a product:



Examples of externalities

Health costs
- Obesity
- Undernutrition
- Air pollution
- Pesticide exposure
- Anti-microbial resistance

Health benefits
- Macronutrients
- Micronutrients
- Emotional well-being

Env. costs
- GHG emissions
- Land degradation
- Use of scarce water
- Biodiversity loss
- Over-exploitation

Env. benefits
- Enablement of farmers to use bio-fertilizers, reduce water usage
- Promotion of sustainable products to consumers (e.g., with fund to sequester CO2)

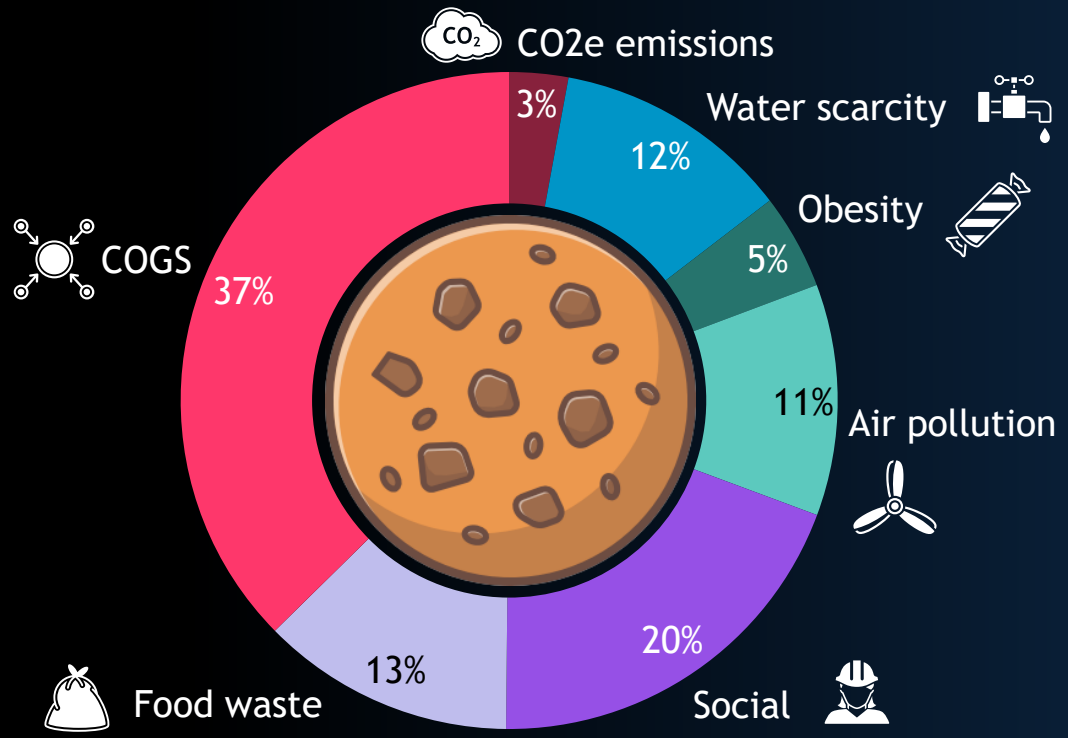
Social costs
- Human exploitation
- Food waste
- Fertilizer leakage
- Animal harm

Social benefits
- Promotion of human rights (e.g., preventing child labor)
- Rural welfare
- Animal welfare

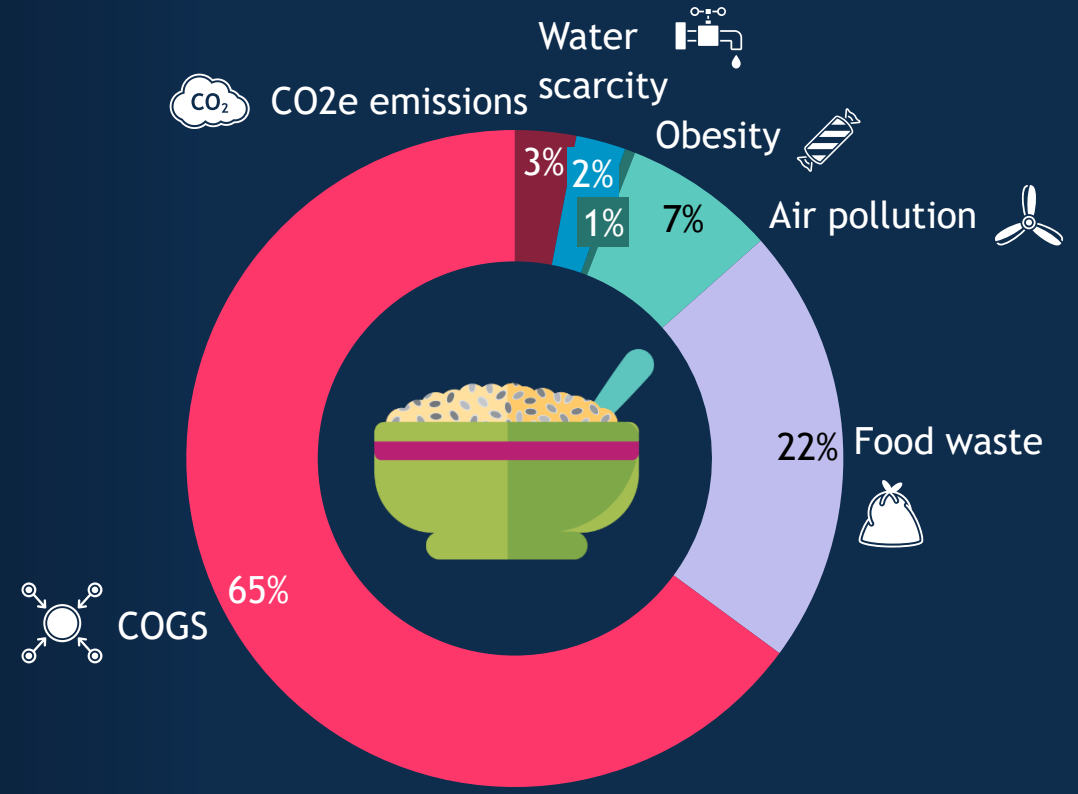
Source: WHO, OECD, FOLU

An initial translation of TVoF to a chocolate-chip cookie and oat porridge illustrates the differences in impact between two comparable snacks

Chocolate-chip cookie[1] produced in Belgium and consumed in the UK has COGS of $0.33, and additional hidden costs[3] estimated at $0.56



Ingredients for oat porridge[2] bought and consumed in the UK have COGS of $0.36, and additional hidden costs estimated at $0.19



1. Composition: flour (30g), sugar (10g), cacao (20g), butter (10g) 2. Composition: oat milk (140ml), oats (40g), apple (20g), peach (20g) 3. Based on selected indicators
Note: no social costs found in porridge; Sources: World Bank, WHO, OECD, FAO, FOLU, True Price, BCG analysis

Impact of COVID not taken into account

The True Value of the foods is estimated by focusing on the most important indicators and leveraging existing measurement frameworks and publicly available data

Index	Indicator	Sub-indicator	Calculation method	Sources used
Environmental costs	GHG emissions	CO2e emissions	CO2e emissions from production by ingredient x CO2e abatement cost + CO2e emissions from transportation (trucking or shipping) from sourcing countries to production country (Belgium)[1], and to consumption country (UK) x CO2e abatement cost	Agribalyse database (ADEME) for emissions from production CarbonCare calculator for transportation emissions FOLU report, ref. abatement cost from CPLC
	Natural capital	Water	Water used for production by ingredient x Share of scarce water use by country x Price of scarce water use	Waterfootprint.org for water used in production FOLU report, ref. FAO for price of scarce water use; GLOBIOM for share of scarce water use Bloomberg scarcity risk levels by country FAO growth in (scarce) water use
Health costs	Consumption	Obesity	DALYs associated with overweight-attributable diseases (diabetes and CVDs) x Intake of 'empty calories' (sugar and saturated fat) as fair share of actual calory intake in the UK x DALY costs in UK	WHO for DALYs in UK associated with obesity OECD Obesity report WHO Consumption patterns World Bank for UK statistics on population; GDP
	Production	Air pollution	DALYs associated with ambient particulate matter and ozone pollution x CO2e emissions from production and transportation x DALY costs in UK	FOLU report, ref. IHME GBP for DALYs associated with air pollution UNEP for global GHG emissions World Bank for UK statistics on GDP
Social costs	Inclusion *Specific to cookies*	Poverty costs	Social costs related to cacao production in Côte d'Ivoire (e.g., impact from insufficient income, child labor) x Cacao used in cookie	True Price report on social costs (for Tony's Chocolonely)
	Inefficiency	Food waste	UK waste of food produced globally x Production cost by ingredient based on margins by food category	UNEP for statistics on food waste BCG expertise on margins by food category

1. Only for cookies

Overview of micronutrients, excluded from the analysis of health costs for cookie and porridge; while majority is present in both foods, porridge contains higher overall share of DRI

Micronutrient	Cookie			Oat porridge		
	Present	Share of DRI[1]	Major sources	Present	Share of DRI[1]	Major sources
Vitamin B-complex	✓	15%	Cacao	✓	>100%	Oats, oat milk, peach
Vitamin D				✓	45%	Oat milk
Vitamin A	✓	10%	Butter	✓	<5%	Peach
Vitamin E	✓	<5%	Butter	✓	<5%	Peach
Vitamin K	✓	<5%	Butter	✓	<5%	Apple, peach
Selenium	✓	20%	Cacao, flour	✓	25%	Oats, oat milk
Calcium	✓	<5%	Cacao	✓	25%	Oat milk
Phosphorus	✓	15%	Cacao, flour	✓	25%	Oats, oat milk
Zinc	✓	15%	Cacao	✓	15%	Oats, oat milk
Magnesium	✓	25%	Cacao	✓	25%	Oats, oat milk
Iron	✓	15%	Cacao	✓	15%	Oats, oat milk
Potassium	✓	10%	Cacao	✓	10%	Oats, oat milk, peach
Copper	✓	90%	Cacao	✓	40%	Oats, oat milk
Manganese	✓	40%	Cacao, flour	✓	>100%	Oats, oat milk

<10% | 10-20% | >20%

1. Dietary Reference Intakes; Note: micronutrients include water-soluble vitamins, fat-soluble vitamins, macrominerals and trace minerals; no micronutrients present in sugar ('empty calory'); Source: NHS, USDA (FoodData Central), National Institutes of Health, Oatly

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Three-step action plan

Early examples of companies accounting for the hidden benefits and costs of food

Adjust or introduce new products to portfolio

Determine hidden benefits and costs to understand impact and dependencies better to inform business planning and investment decisions

Reflect True Value in shadow balance sheet

Account for total True Value of Food and quantify in monetary value for internal reporting and decision-making in the business

Report carbon adjusted earning per share

Adjust earnings per share to account for financial cost of greenhouse gas emissions to increase transparency, especially to investors

Source: Harvard Business Review, CDP, BCG Analysis

Case study I | DSM quantifies environmental and social costs and benefits of Oatwell®

Context

After acquiring OatWell® in 2013[1], Royal DSM signed the Green Deal with the Dutch Government to collaborate towards transparency in natural and social capital.

Approach

- DSM formed **a partnership** with IUCN Netherlands, MVO Netherlands and True Price to develop and share knowledge on natural and social capitals
- Collaborated with True Price to **pilot a study on OatWell®** to assess its impact on natural and social capital across value chain and specific market applications
- Translated impact to **true value of OatWell® ingredients** by assigning economic value to benefits and costs
- **Shared the findings and methodology publicly** for other to use or build on

Decision-making impact

- Positioning of OatWell® ingredients: Promote as a **substitute for wheat flour** as OatWell®'s impact and True Value is significantly greater
- Further steered business models, decisions and **innovation portfolio towards increased societal impact**, not only profit

1. OatWell® is an ingredient brand of oat beta-glucan and can be used in applications like bread and cereals
Source: Royal DSM; True Price; Press review

Outcomes of OatWell® study

- Environmental and social benefits are greater than environmental costs across value chain of OatWell®
- People eat considerably less when OatWell® is part of their healthy diet, reducing environmental costs further as overall food consumption is decreased
- Oat beta-glucan, found in OatWell®, reduces risk of cardiovascular disease by 20%

> *The food system is both the cause and the biggest victim of our [global society's] way of doing things and the only way to turn it around is to actually start measuring things differently*
>
> *This has been driving our innovation, capital allocation and proposition to our customers*

Geraldine Matchett, Co CEO, CFO & Member of the Managing Board, DSM

Case study II | Olam accounts for impact and dependencies in monetary value in their IIS[1]

Context

Olam is committed to "re-imagining global agriculture and food systems" and "regenerating the living world", particularly through climate action

Approach

- Formed cross-function[2] **Integrated Reporting Task Force** to evaluate Olam's approach to Multiple Capital Accounting (MCA)
- Developed **Integrated Impact Statement** (IIS) to measure, quantify and report **long-term 'invisible' value** – tool providing all BUs with **monetary perspective** of impacts and dependencies on key non-financial capitals[3]
- **Finance for Sustainability** department established in Finance function as centre of excellence **to embed MCA** across the Olam Group, led by Olam Food Ingredients (OFI)[4] MD and Group CFO

Decision-making impact

- To provide **key insights** on risks and opportunities to help Olam transform operations **to reduce "on the ground impact"**
- **Demonstrate natural, social and human capital value** arising from our operations and programmes through **MCA**
- To analyse which factors create or erode value in the organisation and make **more objective calls** on parameters effecting those issues

1. IIS = Integrated Impact Statement; IIS does not alter standard financial reporting to stakeholders 2. Team include representatives from Finance, Risk, HR and Sustainability 3. Key capitals include social, human and natural capital. 4. Olam Food Ingredients is a new operating group as part of Olam Group; Source: Olam

Impact

With the ability to measure impact and dependencies from non-financial capitals, IIS supported the OFI cocoa platform in driving tangible change

- Full-scale natural capital accounting for the business 2018-2020, covering GHG emissions, water use and land use change.
- Using data from IIS the cocoa team was able to quantify and demonstrate:
  - 20% reduction in natural capital costs per metric tonne of cocoa beans processed from 2018 to 2019 and 13% reduction from 2019 to 2020
  - 5% reduction in natural capital costs per metric tonne of cocoa beans grown through farmer sustainability programmes, from 2018 to 2019 and 4% reduction from 2019 to 2020

> *"Because what gets measured, gets managed, the IIS supports us in strategic decision-making by quantifying our impact and dependencies…. and helps us chart a course of action."*
>
> *Ria Bakshi, Lead Finance for Sustainability at Olam*

Case study III | Danone creates partnership to kick-start their action against climate change

Context

In 2008, Danone had set an initial ambition to reduce its carbon emissions by 30% on direct responsibility scope by 2012

Approach

- **Initiated action by partnering** with Ramsar Conversation on Wetlands and International Union for Conservation of Nature (IUCN) to form Danone Fund for Nature (DFN)
- Aimed to restore **degraded ecosystems**, redevelop **local economies** and combat **climate change**
- Obtained **carbon credits to offset emissions** of its brands, mainly Evian, by **supporting and financing projects** to preserve and restore wetlands

Decision-making impact

- Created **methodology**, recognized under Clean Development Mechanism of UN Framework for Convention for Climate Change, **to fund development projects through carbon credits** gained from mangrove restoration
- Innovated **new model** where **companies take hands-on approach to sustainability** by working directly with project developers to deliver strong social and economic impacts in addition to getting carbon credits

Source: Danone Fund for Nature; Livelihoods funds; Ramsar

Impact

- Implemented mangrove restoration project in Senegal (largest mangrove restoration globally to date), supporting and financing Senegalese NGO Oceanium to plant 10k ha (79M) mangroves in shrinking forests
- Evolved DFN into Livelihoods Carbon Fund, by expanding partnership to include 9 other companies, that has invested €40M in projects and aims to sequester 10M tonnes CO_2 between 2011-2031

> *If you want to pioneer you cannot wait for global standards, but you need to find the right partners to move fast*
>
> *Antoine Guttinger,*
> *Senior Vice President Finance, Danone*

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- Three-step action plan

Three-step plan of action for executive teams to leveraging true value of food in decision-making

1 Where to start

Reflect on impact of external drivers on your business given your portfolio, value chain, and geography position

Start with a good lighthouse to test, learn and see impact fast

2 How to activate

Define which decisions will be influenced by the incorporation of the True Value of Food

Decide on the measurement framework(s) as the basis of the decision making

3 How to create most value & scale

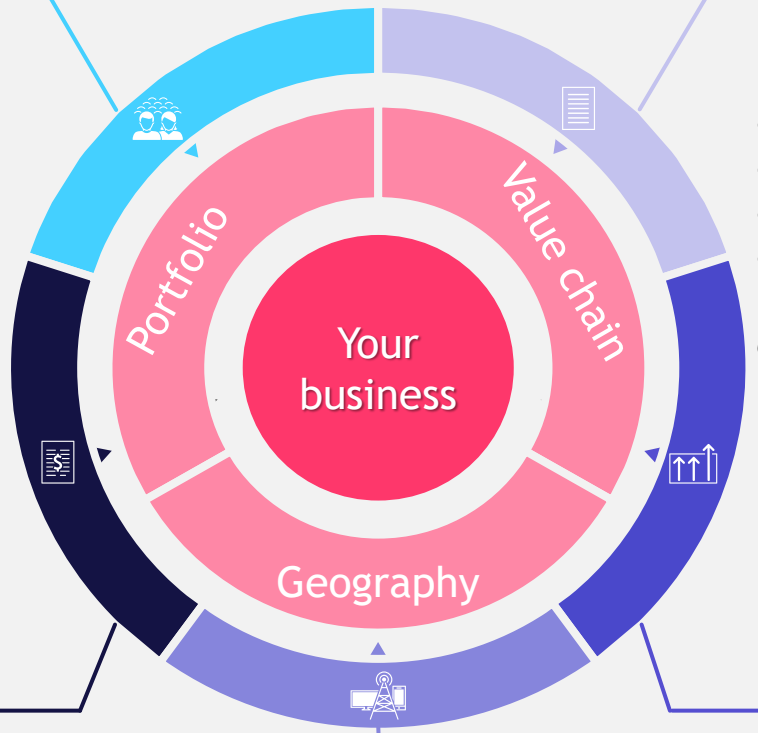
Organize for success and create increased value by installing key principles for success

1a

Where to start

Reflect on impact of external drivers on your business considering your latest materiality assessment[1] and your current business across the portfolio, value chain, and geography matrix

Identify opportunities and/or risks created for your business



Consumer
Which exiting profit pools are at risk and which new ones emerge as a result of changing consumer trends? – at what pace is this impacting

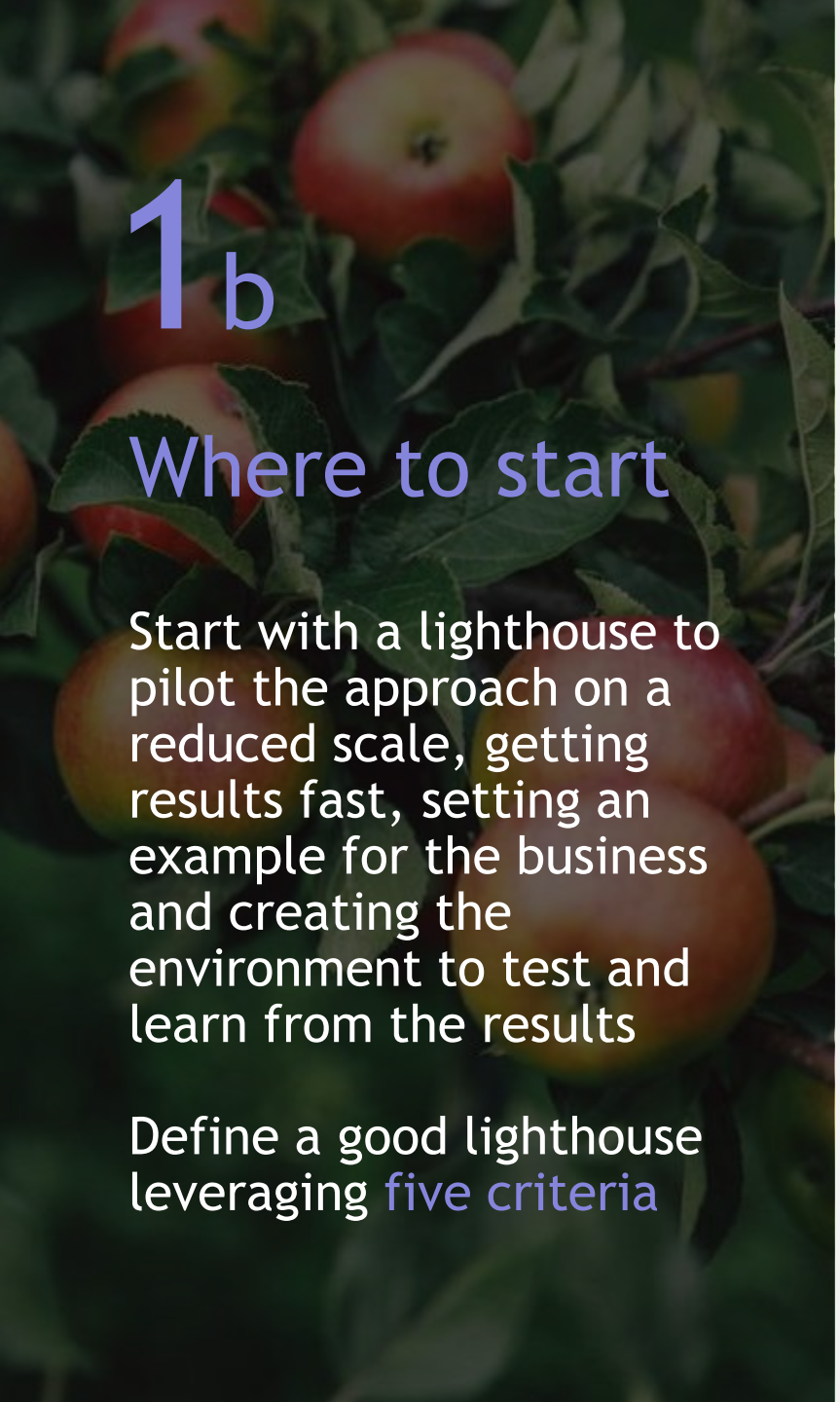
Regulations
How are the evolving regulations influencing the industry and impacting your business today and near to mid-term? - *e.g. restrictions, tax implications, subsidy opportunities*

Financial markets
Are there interesting financing options that could be leveraged in relation to (elements of) TVoF?

Media
How real is the direct and indirect (via consumer influencing) risk of media attention given your business?

Competitors
Are peers making moves and changing the playing field? Is there a risk of sustainability scarcity?

1. Materiality assessment is the process of identifying and evaluating potential environmental, social and governance opportunities and risks that could impact an organization and its stakeholders to help prioritize which topics to focus on in the strategy, targets, monitoring and evaluation and reporting



1b

Where to start

Start with a lighthouse to pilot the approach on a reduced scale, getting results fast, setting an example for the business and creating the environment to test and learn from the results

Define a good lighthouse leveraging five criteria

Engaged consumers | A market segment in which consumers are increasingly interested and looking for (more) sustainable alternatives creating new profit pools

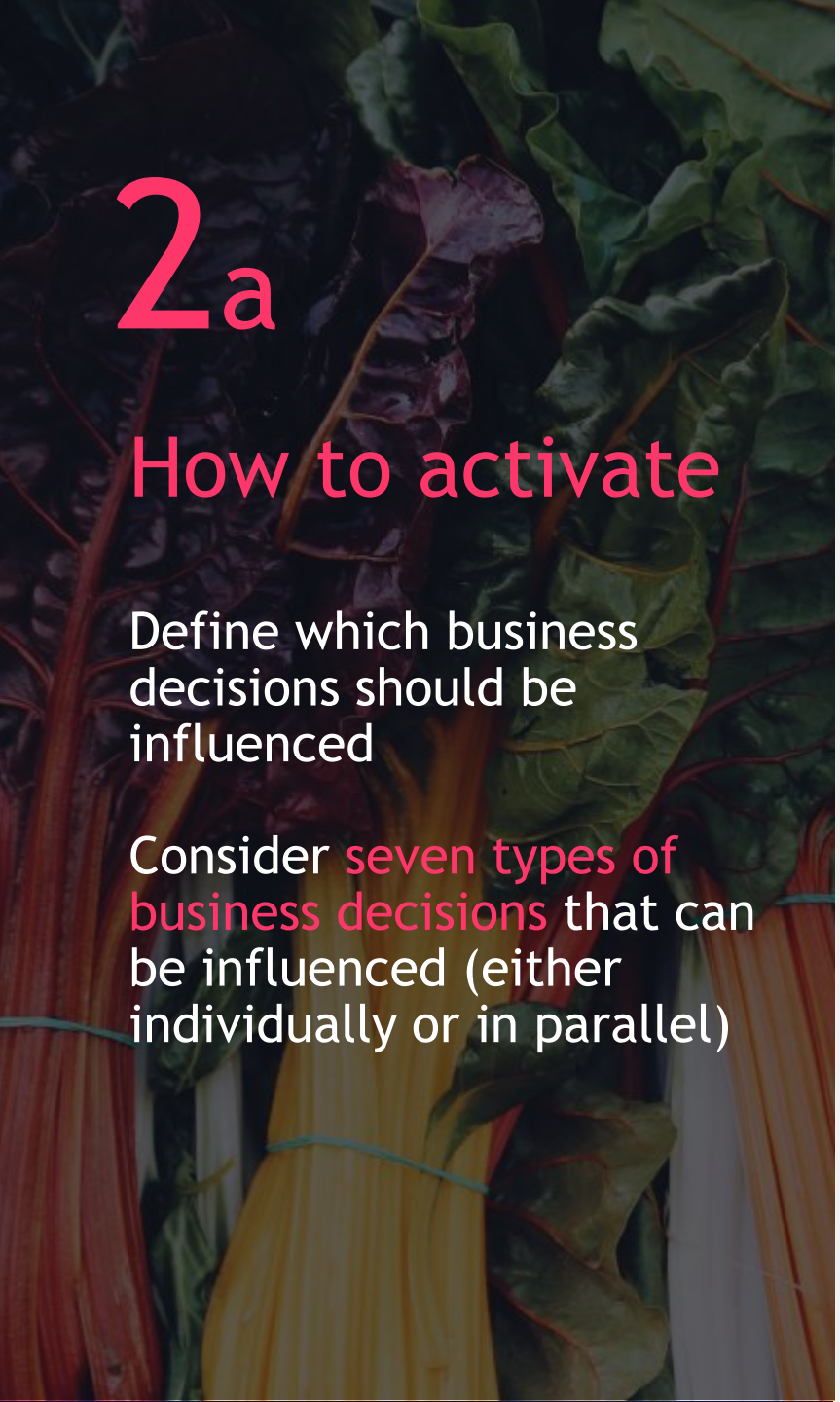
Strong competitive position | A market in which you can leverage a strong market position and/or see M&A opportunities

Risk of customer retention | Segments where (lack of) sustainability leads to direct customer retention risks

Motivated internal leadership | Leadership that is motivated and engaged to think about the next evolution of the business

Strategically relevant | Representative enough of the business that with this lighthouse you have enough evidence to start to build towards rest of portfolio

Risk mitigation | Target business lines that have identified significant sustainability risks



2a

How to activate

Define which business decisions should be influenced

Consider seven types of business decisions that can be influenced (either individually or in parallel)

Composition of existing portfolio
Evaluate and adjust existing product portfolio using 'Stop – Substitute – Avoid – Add' to improve individual products by changing ingredient composition

Stop ingredients… that contain much sugar and fat; with high CO_2e; sourced in regions with low employee welfare. **Substitute** ingredients… with lower sugar/fat content / CO_2e footprint ingredients. **Avoid** ingredients… similar to those substituted, by scanning list of ingredients. **Add** ingredients… that are nutritious (fortification)

Investment in future portfolio | Include R&D pipeline for product innovations and new product launches

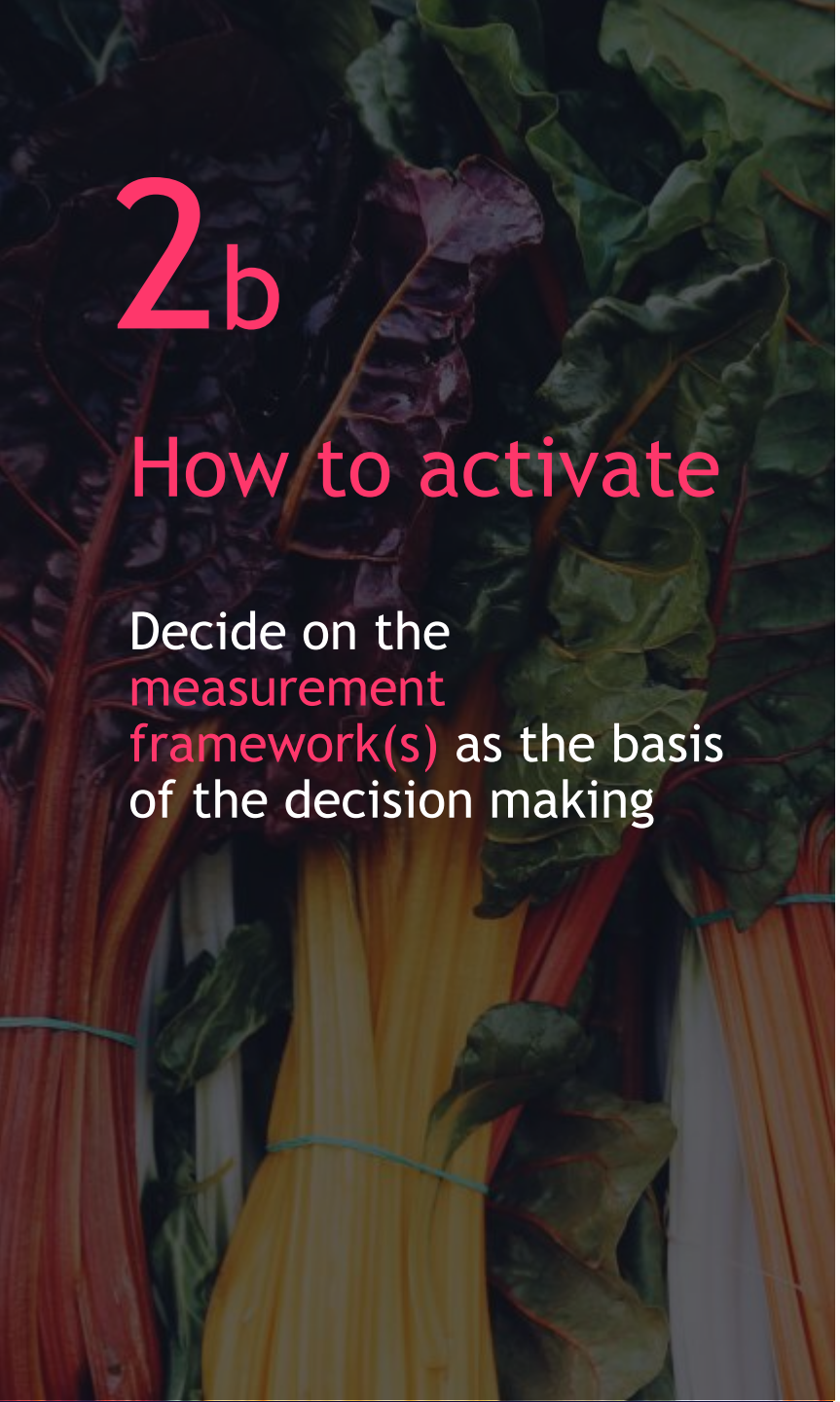
Sourcing | Impose sourcing conditions to suppliers; promote sustainable product practices (e.g., no-till farming); create incentives to source and distribute more locally; invest in internal reporting for transparency and access to data from suppliers, operations and consumers

Supply chain | Optimize transportation type, delivery routes, storage, inventory and revisit/revamp by-products

Product marketing | Optimize shelve space in line with sustainability of product portfolio; increase pricing of products with 'empty calories'; introduce loyalty program for sustainable products; Focus price promotions on healthy products and avoid '1+1'-promotion to reduce waste

Product information | Educate consumers and build awareness by adjusting packaging information; e.g., by including Nutri-Score, external certification (e.g., B Corp), sourcing locations, advice on 'consumption per day'

M&A and partnerships | Consider M&A to boost internal capabilities and accelerate; establish R&D partnerships for sustainable sourcing, visibility to consumers; cooperate with farmers to decrease use of pesticides; raise awareness on nutrition with NGOs



2b

How to activate

Decide on the measurement framework(s) as the basis of the decision making

Measurability & transparency is key to understand, evaluate and actively steer pathways

Good measurement frameworks are publicly available to use directly or be adjusted to your organization and purpose (driven by decisions it will be used for)

TEEB for Agriculture and Food: Operational Guidelines for Business	CAPITALS COALITION, TEEB The Economics of Ecosystems & Biodiversity, UN environment programme
TEEBAgriFood Evaluation Framework: Overarching Implementation Guidance	TEEB The Economics of Ecosystems & Biodiversity, UN environment programme, GLOBAL ALLIANCE FOR THE FUTURE OF FOOD
The Doughnut of social and planetary boundaries (by Kate Raworth)	
TNFD framework (currently in development and to be deliver by 2023)	TNFD
Natural Capital Protocol, Social & Human Capital Protocol	CAPITALS COALITION
Value Balancing Alliance method (and forthcoming food and agriculture guide)	value balancing alliance

3

How to create most value & scale

Organize for success

Create more value by keeping six principles in mind

Incorporate at key decision points | Explicitly embed the true value measurement into decision making processes e.g., making it a requirement to clear product design or internal investment hurdles, assessing portfolio in annual budget cycles

Direct feedback-loop | The impact of the food transition is not a one-off, being successful requires a mindset and capability of continuous improvement. Impact needs to be measurable, transparent and evaluated to successfully define the next step – this is a muscle that needs to be developed and trained especially for teams starting to define their approach and first steps

Align incentives | KPIs are aligned and transparent across the organization to reinforce changes to decision-making e.g., include sustainability indicators in KPIs of procurement or R&D team

Plan for scale | Design for initiatives to be scaled across the portfolio, estimating the costs and impact of doing so from the start in design of pilots

Commitment and dedication | Commitment across the executive team with a clear C-level sponsor (e.g., the CEO or CFO could play a key role in the integration into business decisions) that supports a dedicated person / team driving the integrated agenda and impact across the organization

Strong partnerships | Work together with other ‘shapers’ of the context to accelerate impact (e.g., governments, industry peers, start-ups, policy makers, investors)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