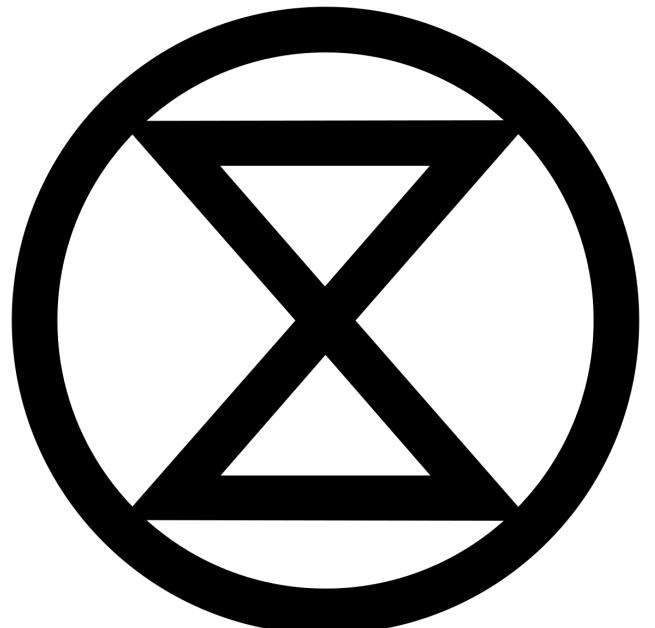


Accelerating a Sustainable Food Future



Manuel Klarmann



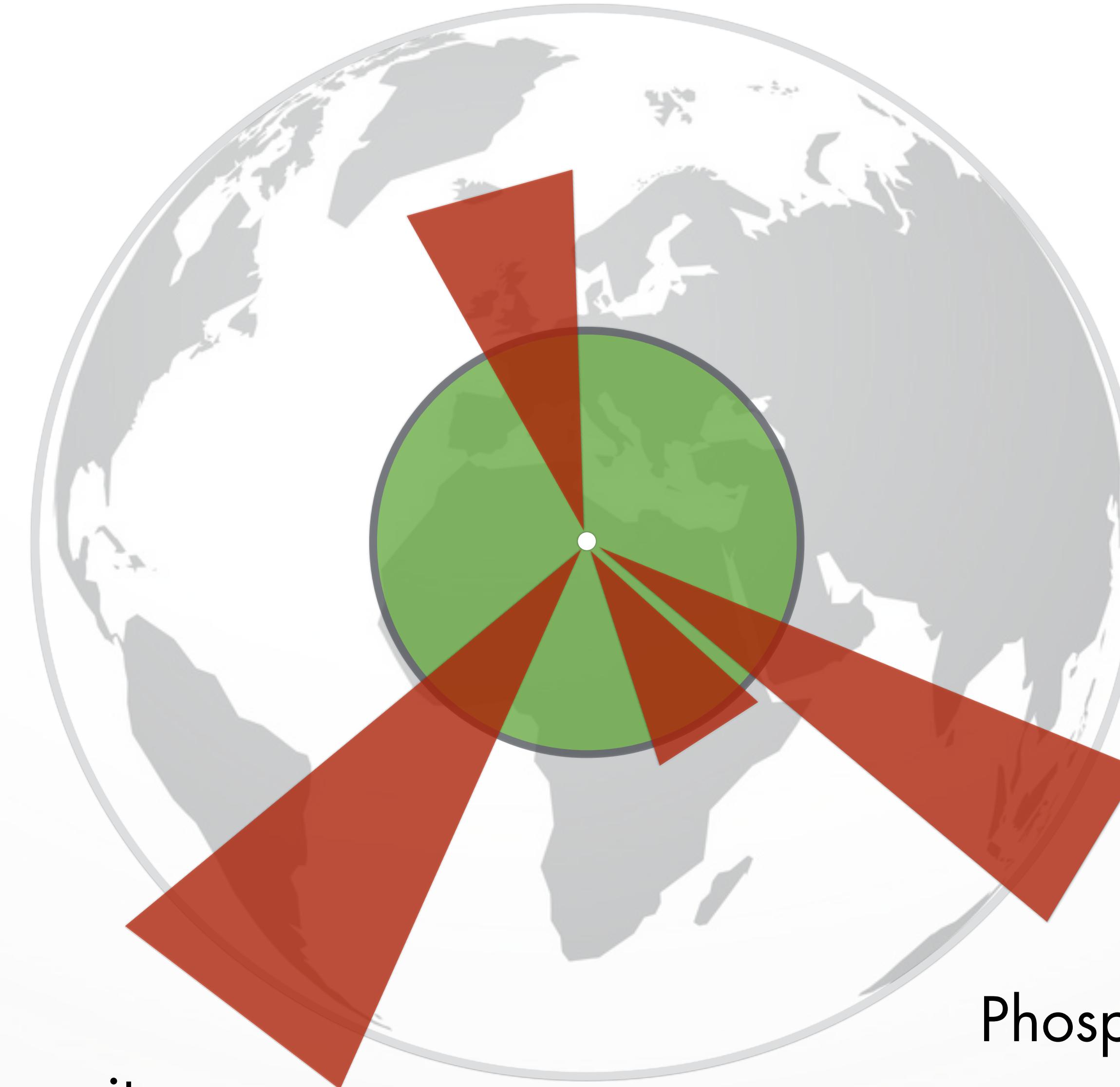
www.eaternity.org
mklarmann@eaternity.ch
+41 77 44 66 981
@mklarmann

Global Issue

Relationship to Food
The Science
Solutions

Planetary Boundaries

Climate



Biodiversity

Nitrogen

Phosphor

Irreversible Consequences

Nitrogen



Irreversible Consequences

Biodiversity



Irreversible Consequences

Climate



Climate Crisis



272 million people



Reuters/T. Schmu



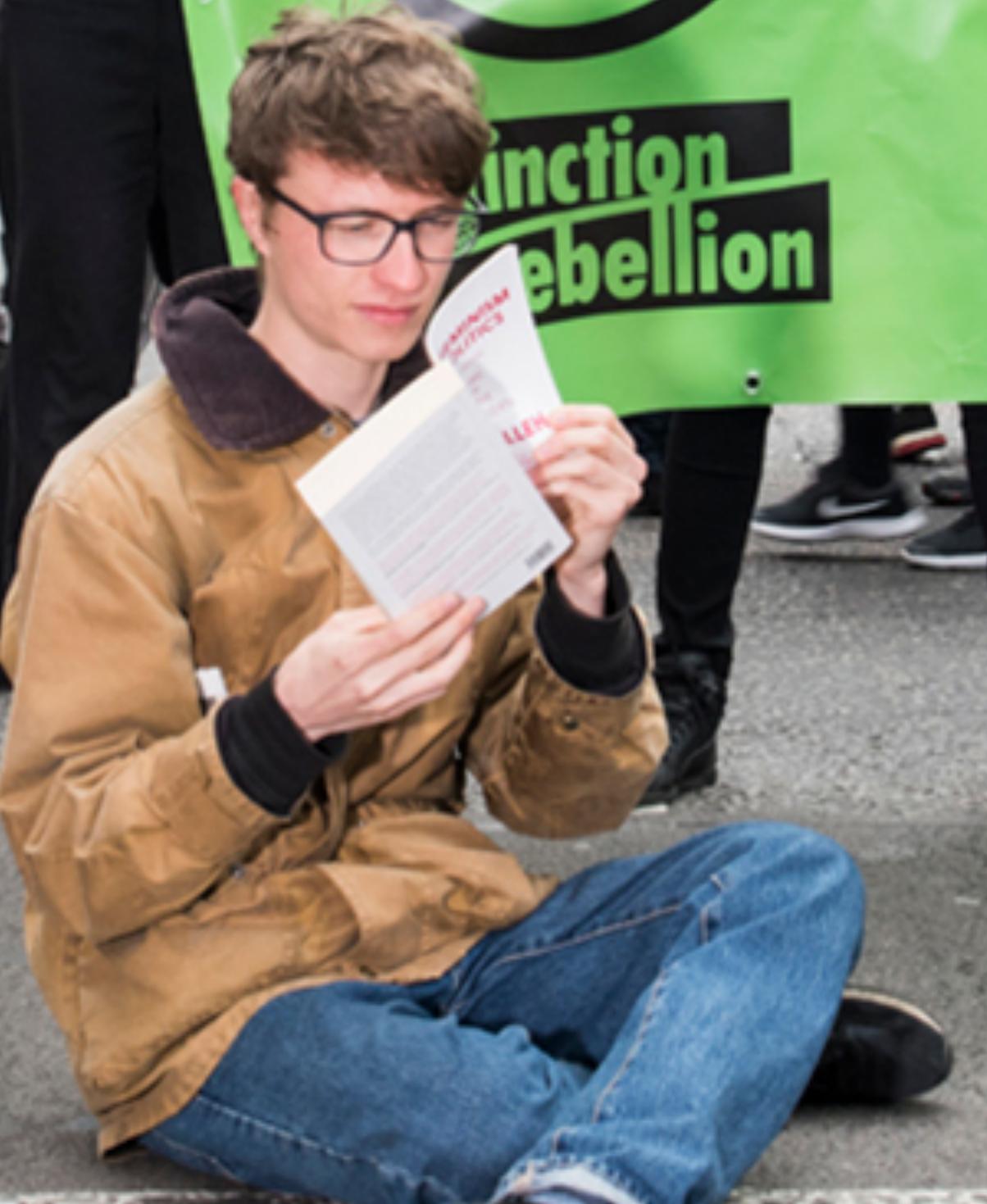
**CLIMATE CHANGE:
12 YEARS TO SAVE EARTH**

children's
future



extinction
rebellion

**WE CAN'T EAT
MONEY**



ARE WE THE LAST GENERATION?





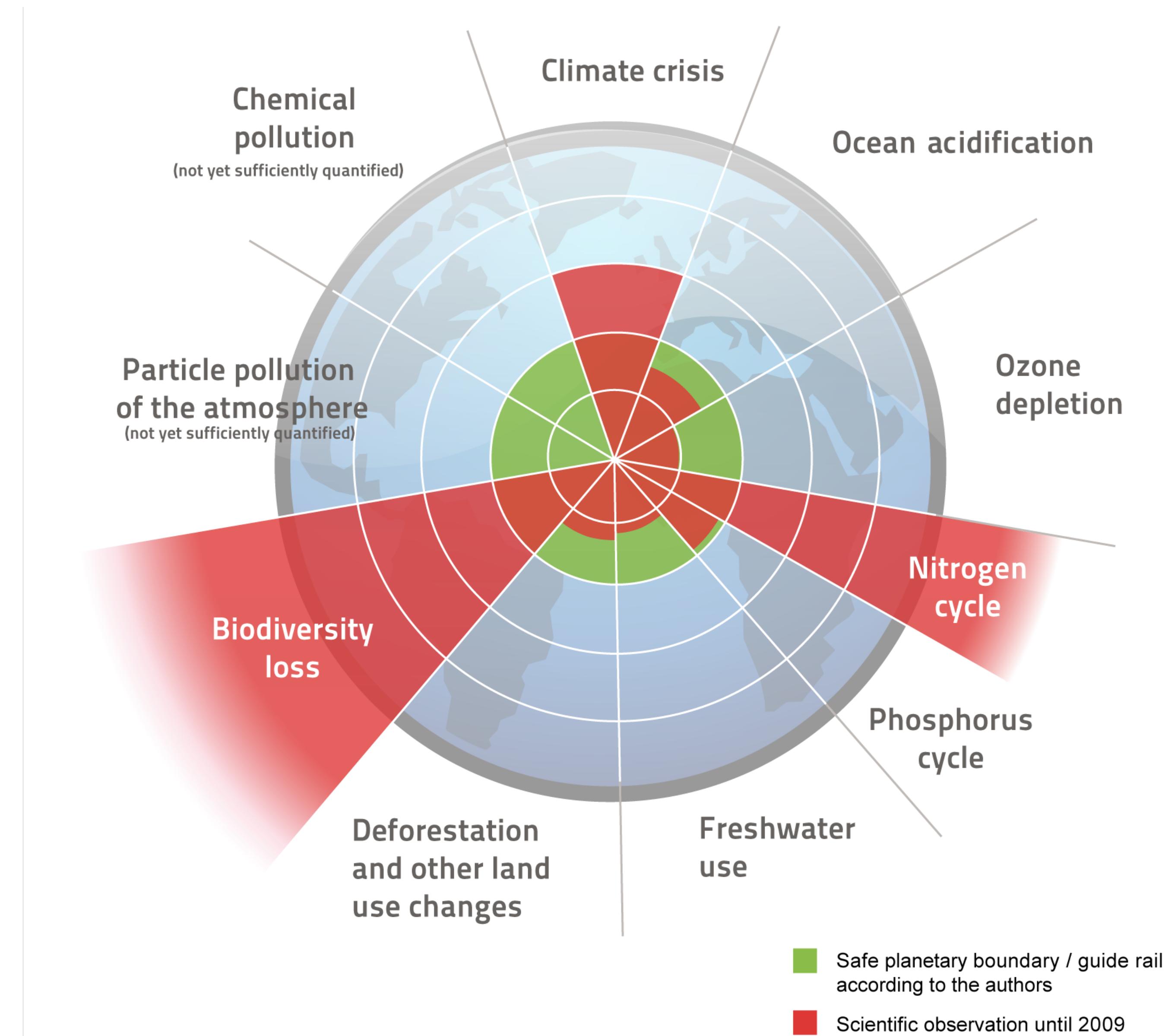
Global Issue

Relationship to Food

The Science

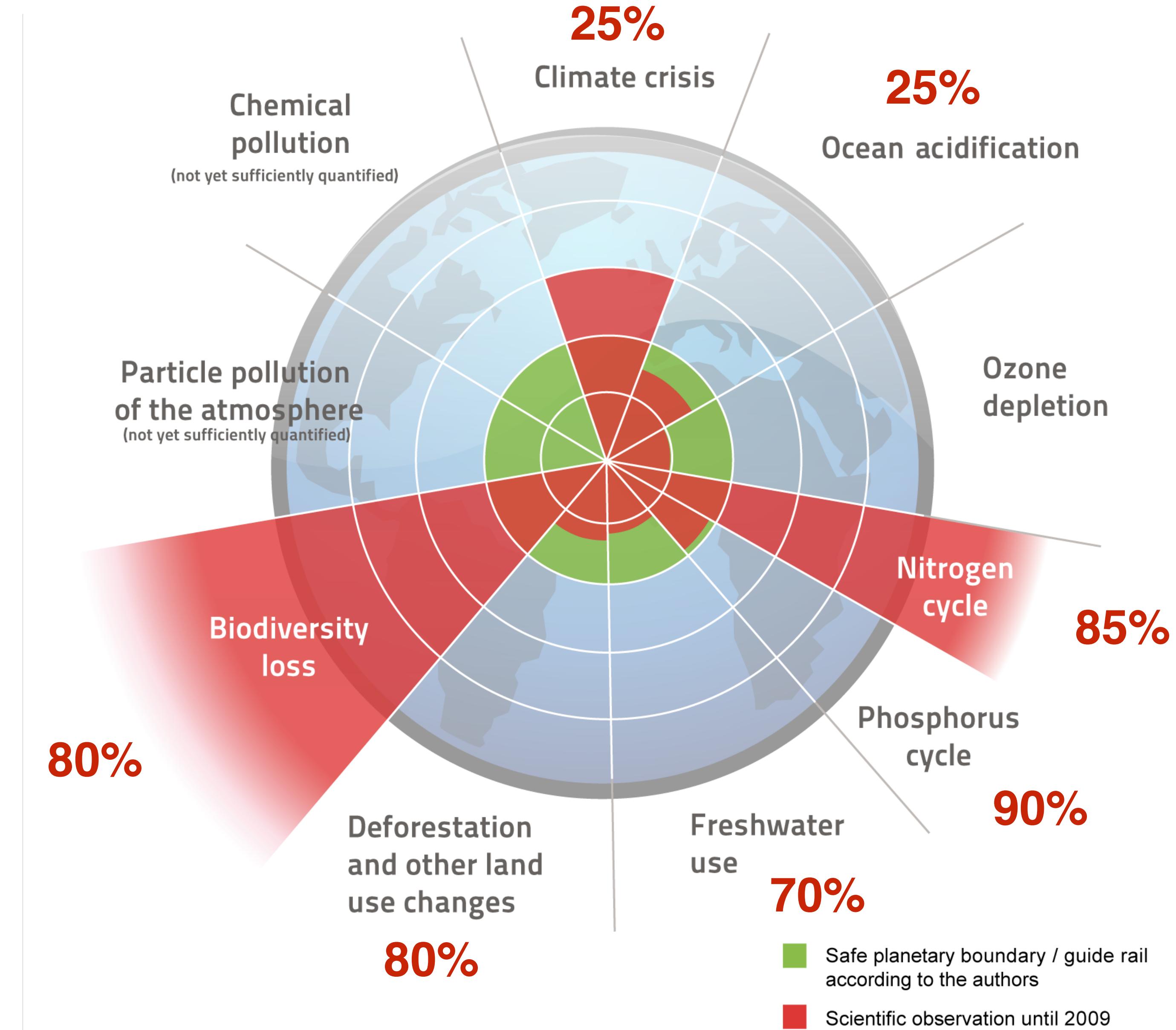
Solutions

Planetary Boundaries

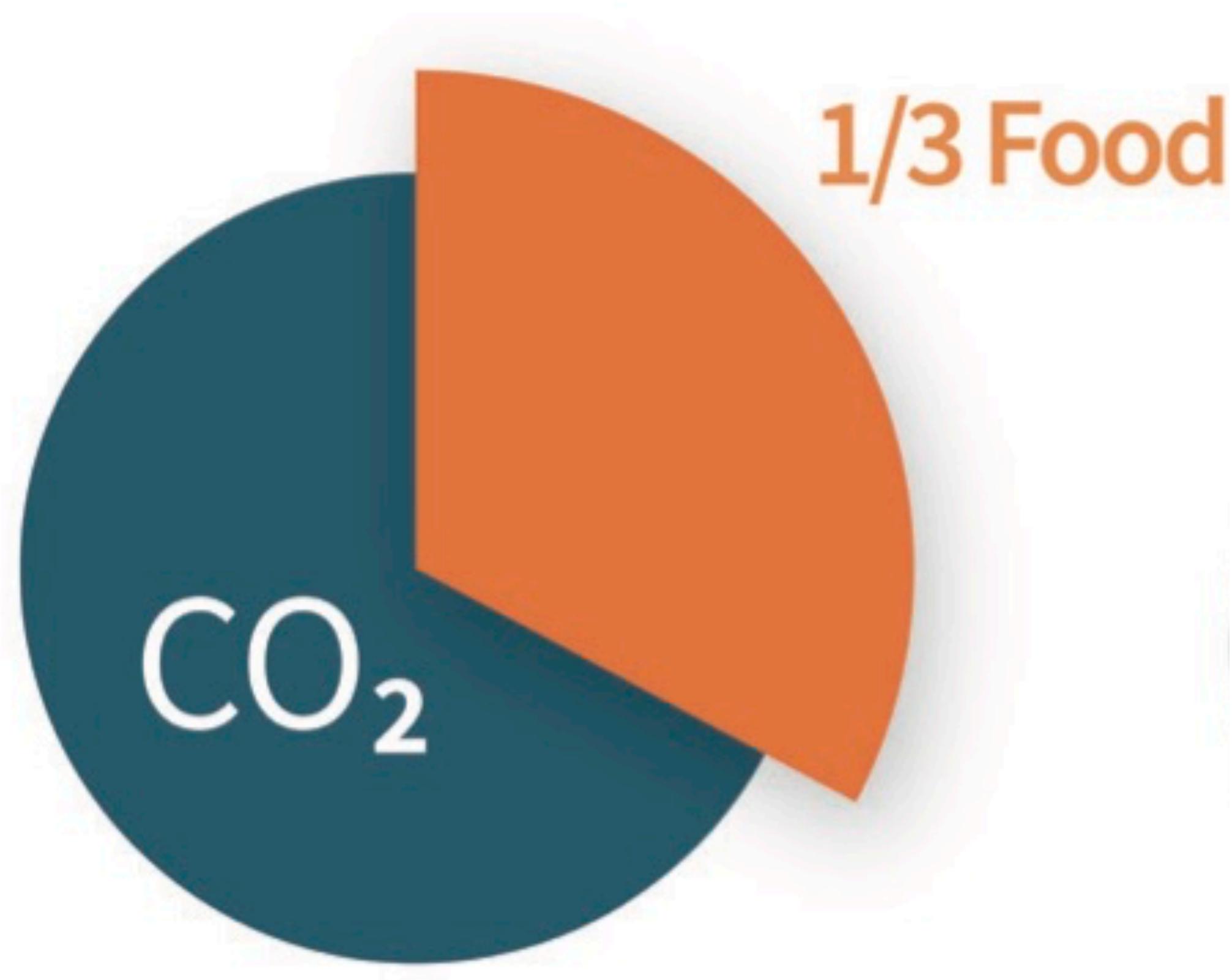


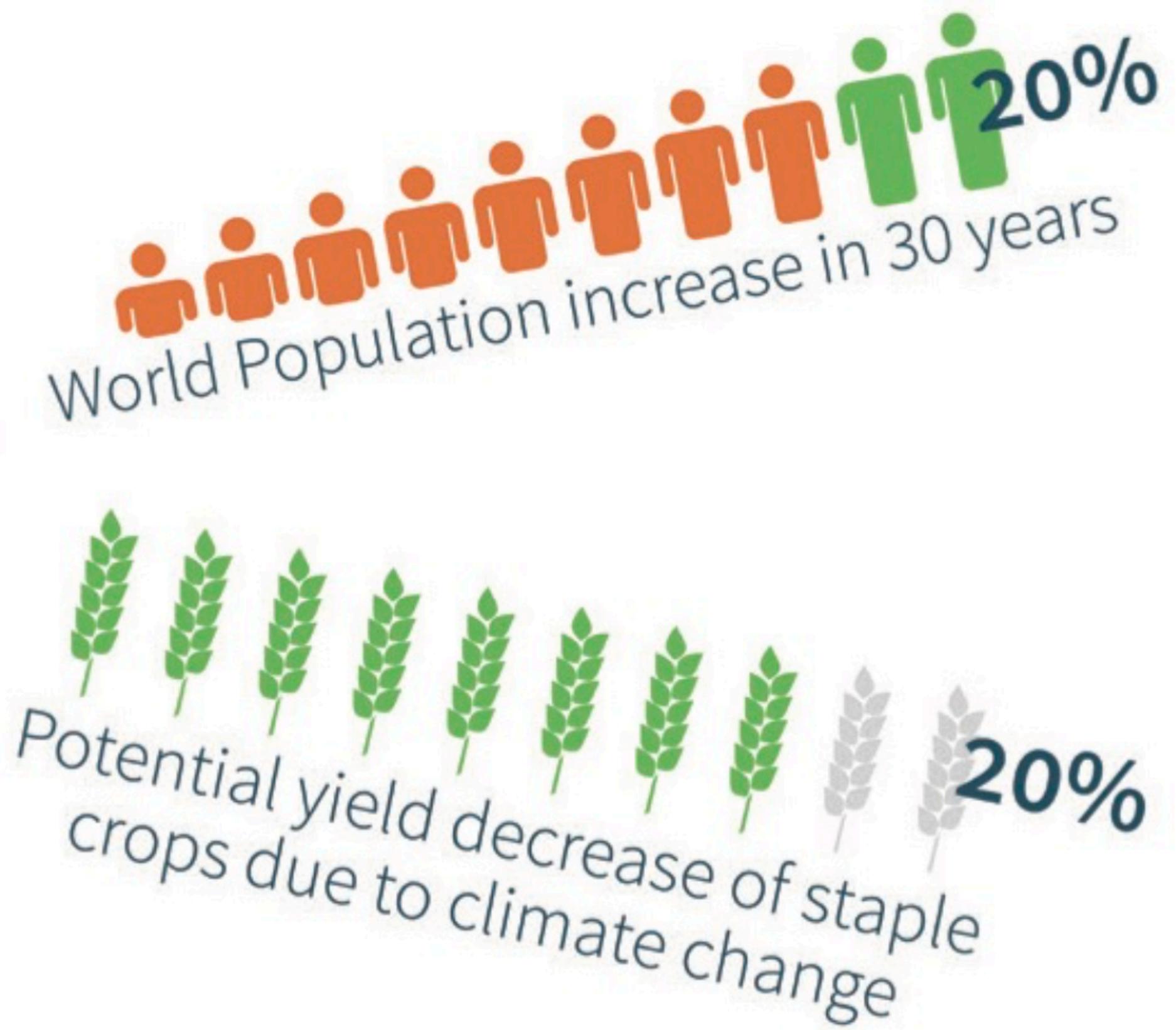
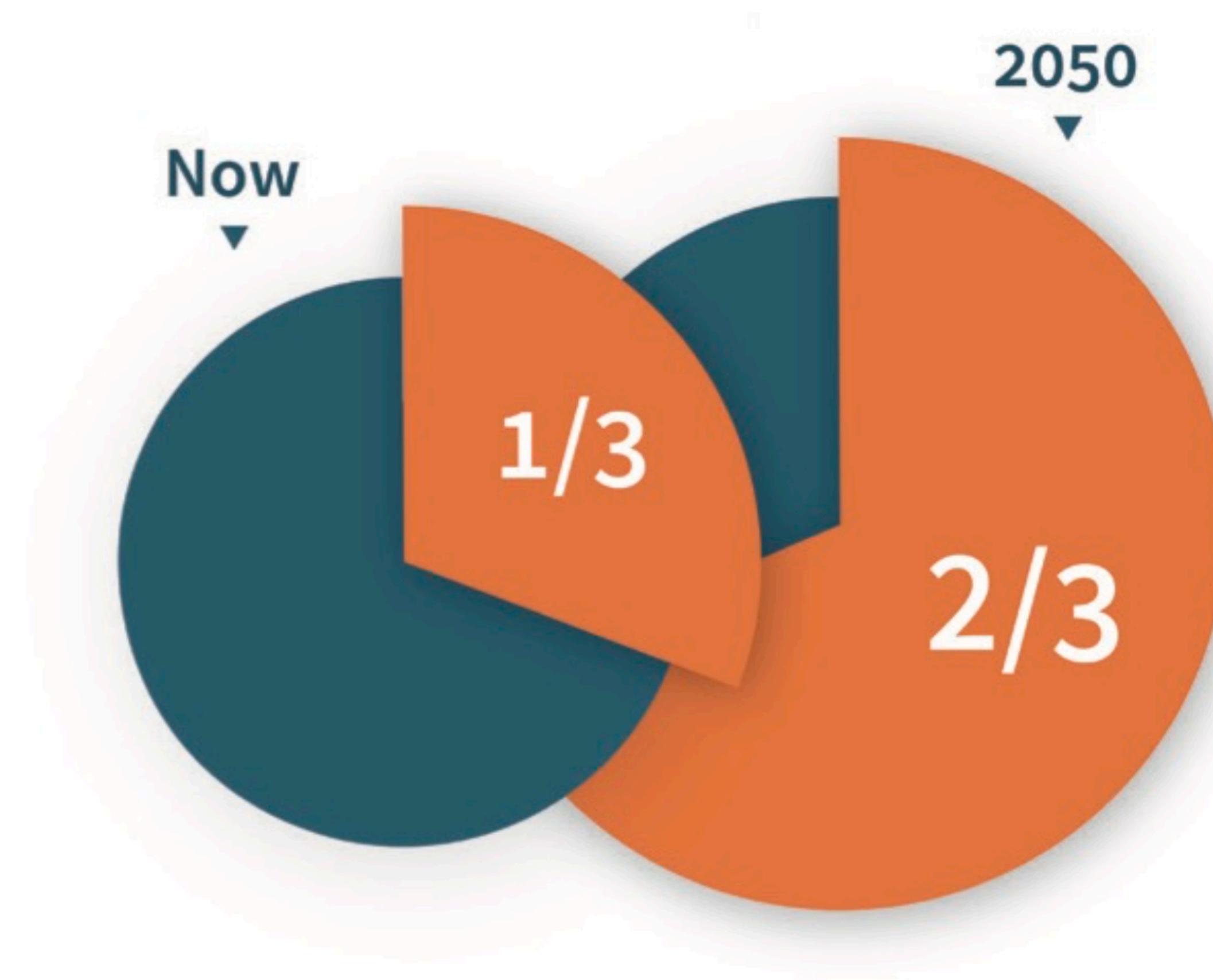
Planetary Boundaries

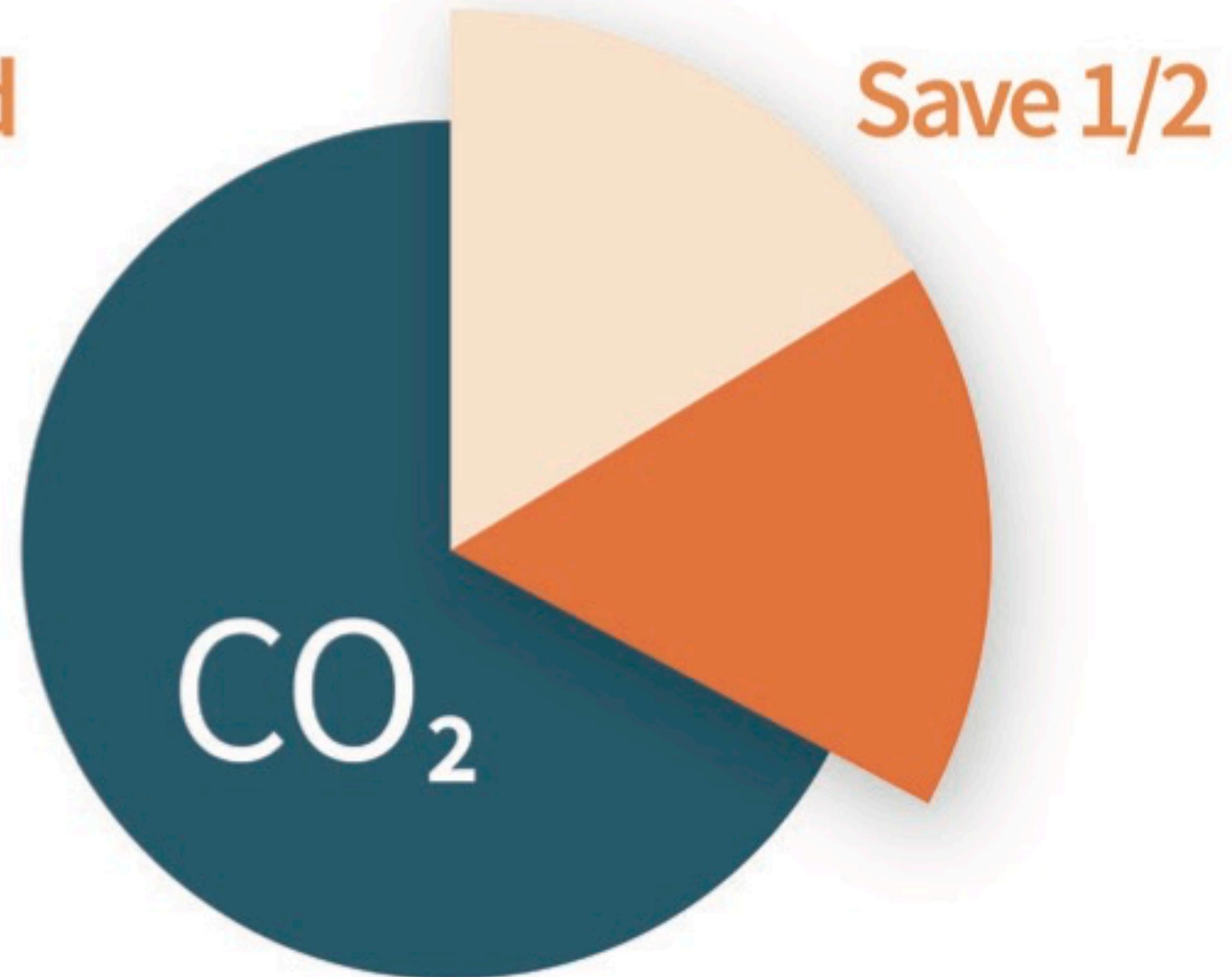
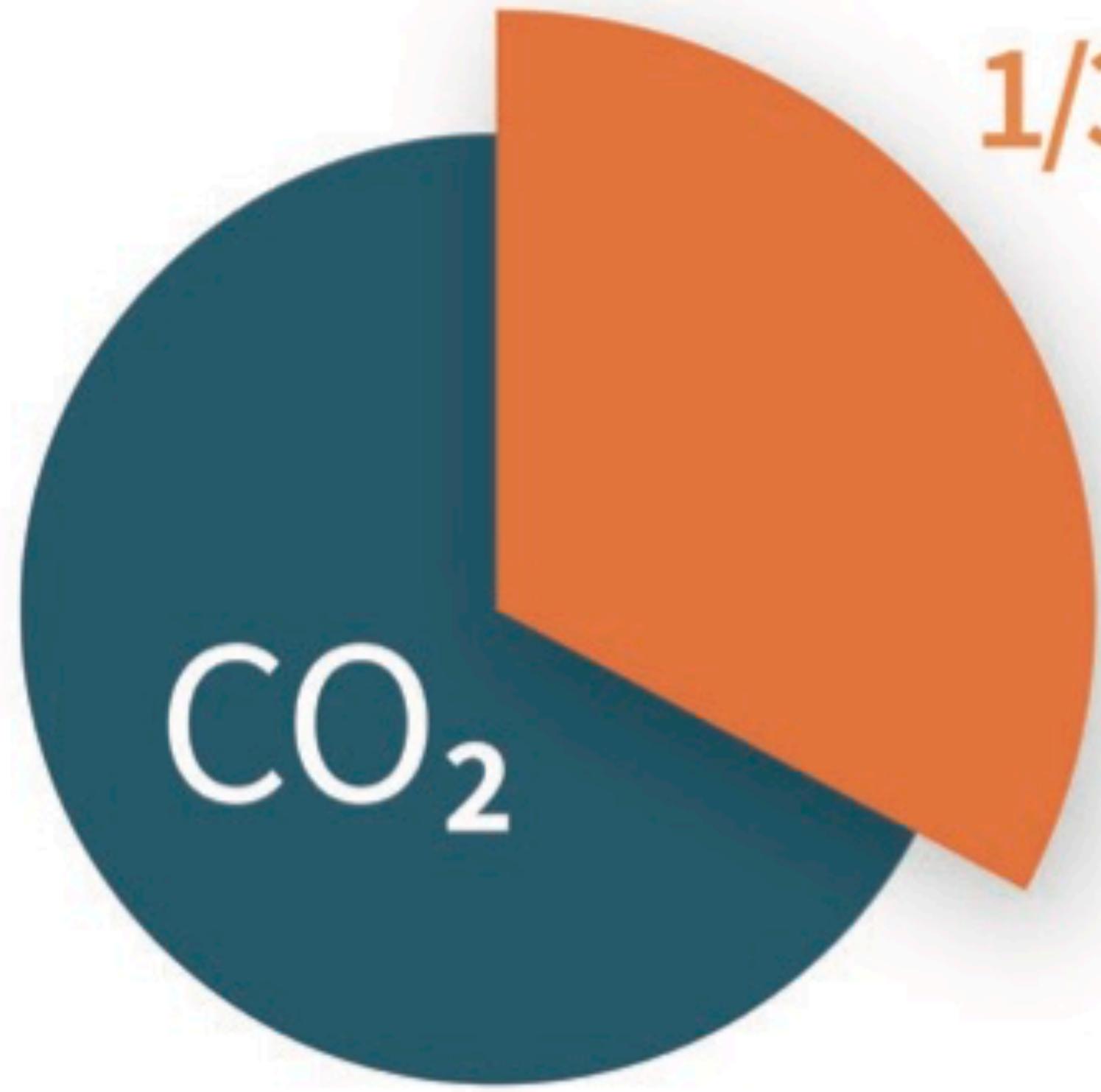
Proportion Agriculture

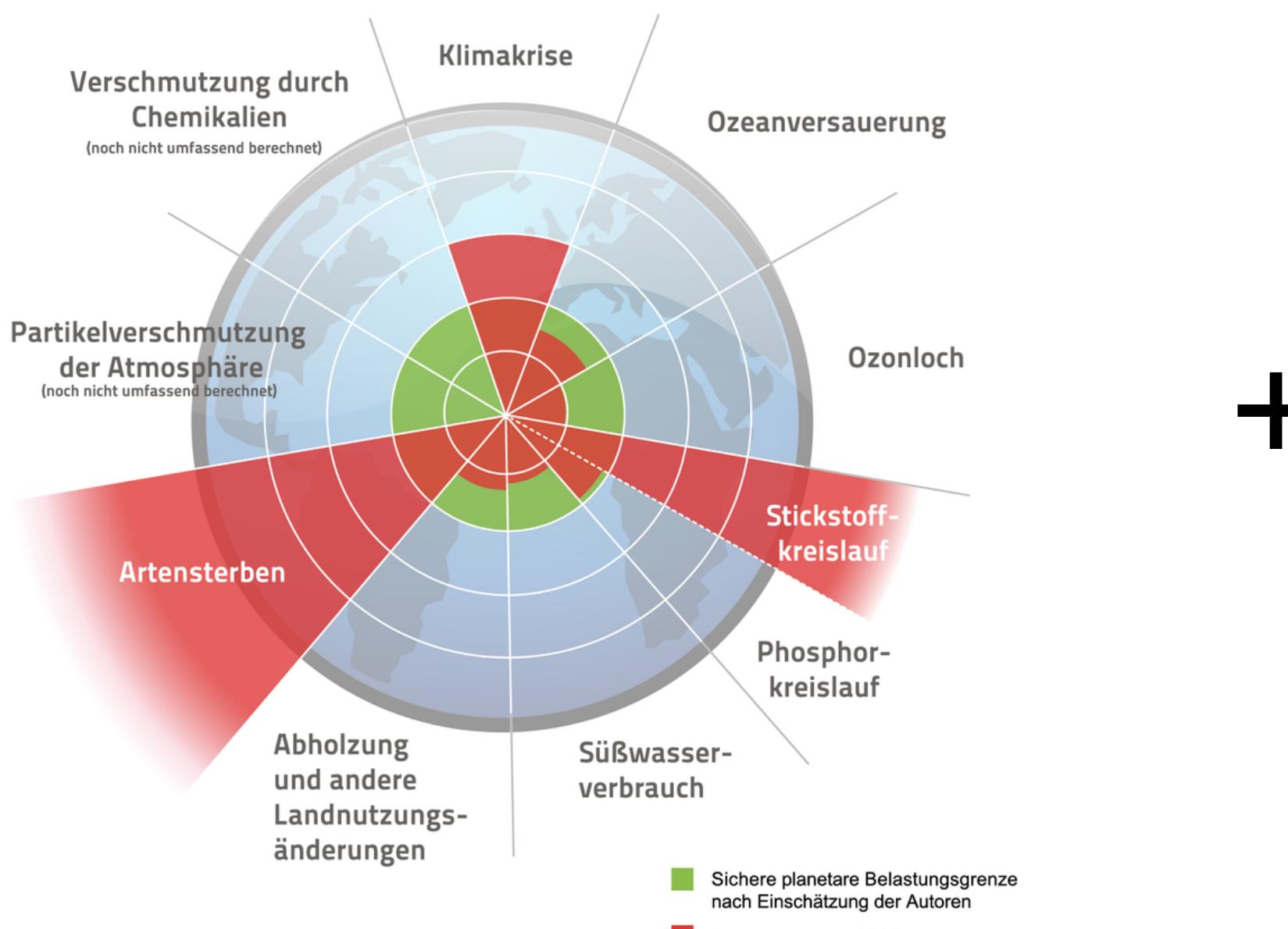


Steffen et al., 2015, Campbell et al., 2017









+



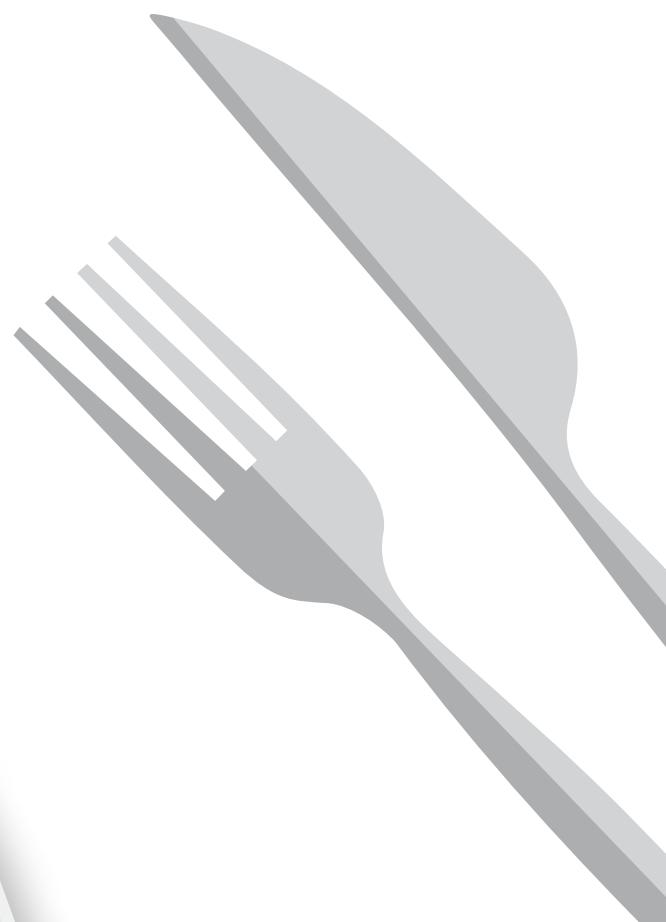
= Sustainable Food Future

Diet of the Future

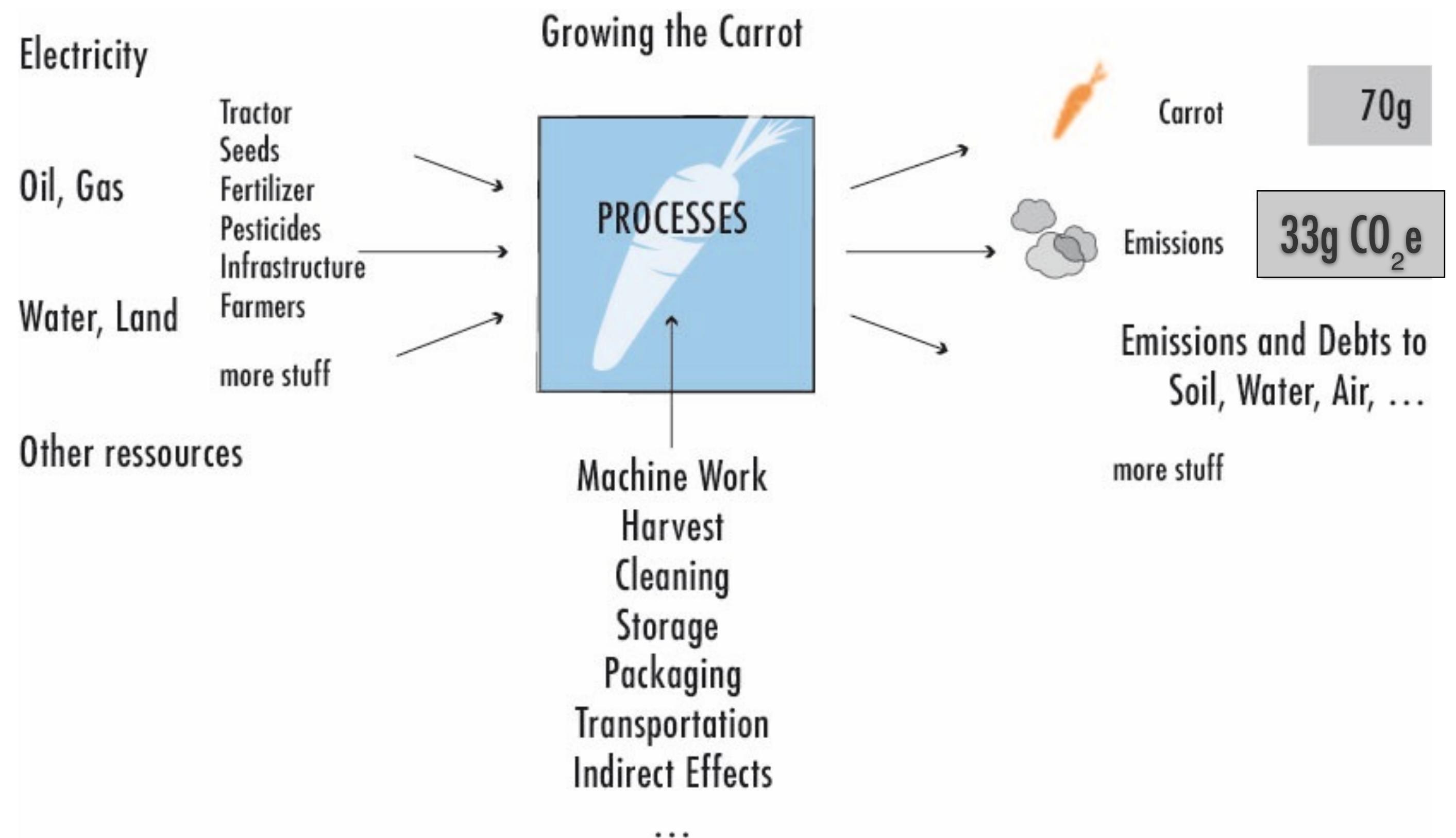
Extended Data Table 5 | Food-based dietary recommendations for healthy, more plant-based (flexitarian) diets

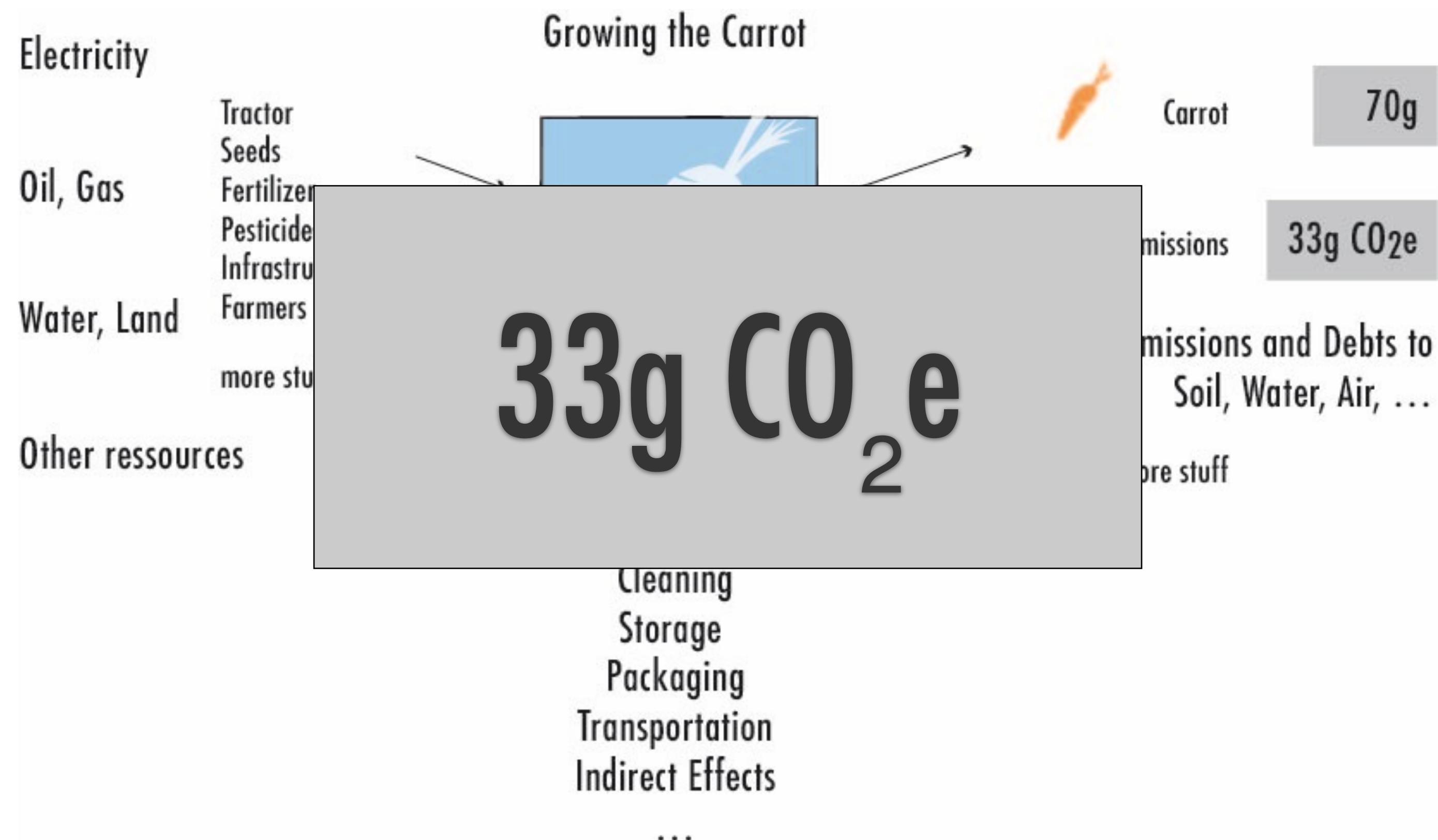
Food item	minimum level g/d	serving	maximum level g/d	serving
wheat				
rice			A total of up to 860 kcal/d for energy balance for all staple crops	
maize				3-4 (1/3 of energy)
other grains				
roots				
+400%	legumes	50	1/2	
+100%	soybeans	25	1/4	
	nuts & seeds	50	2	
+50%	vegetables	300	3-4	
	fruits	200	2-3	
	sugar		31	5% of energy
	palm oil		6.8	1
	vegetable oil		80	1/3 of energy
-84%	beef			
	lamb		A total of 14 g/d for all red meat	
	pork			1/7
✓	poultry		29	1/2
	eggs		13	1/5
-75%	milk		250	1
	shellfish			
	fish (freshwater)		A total of 28 g/d for all fish and seafood	
	fish (demersal)			1/2
	fish (pelagic)			

The recommendations include recommended minimum and maximum intakes expressed as weight or calories, and servings. Fish and seafood can be replaced by plant-based foods (legumes, soybeans, nuts and seeds, fruits and vegetables) in vegetarian diets. Units are g or kcal per day.

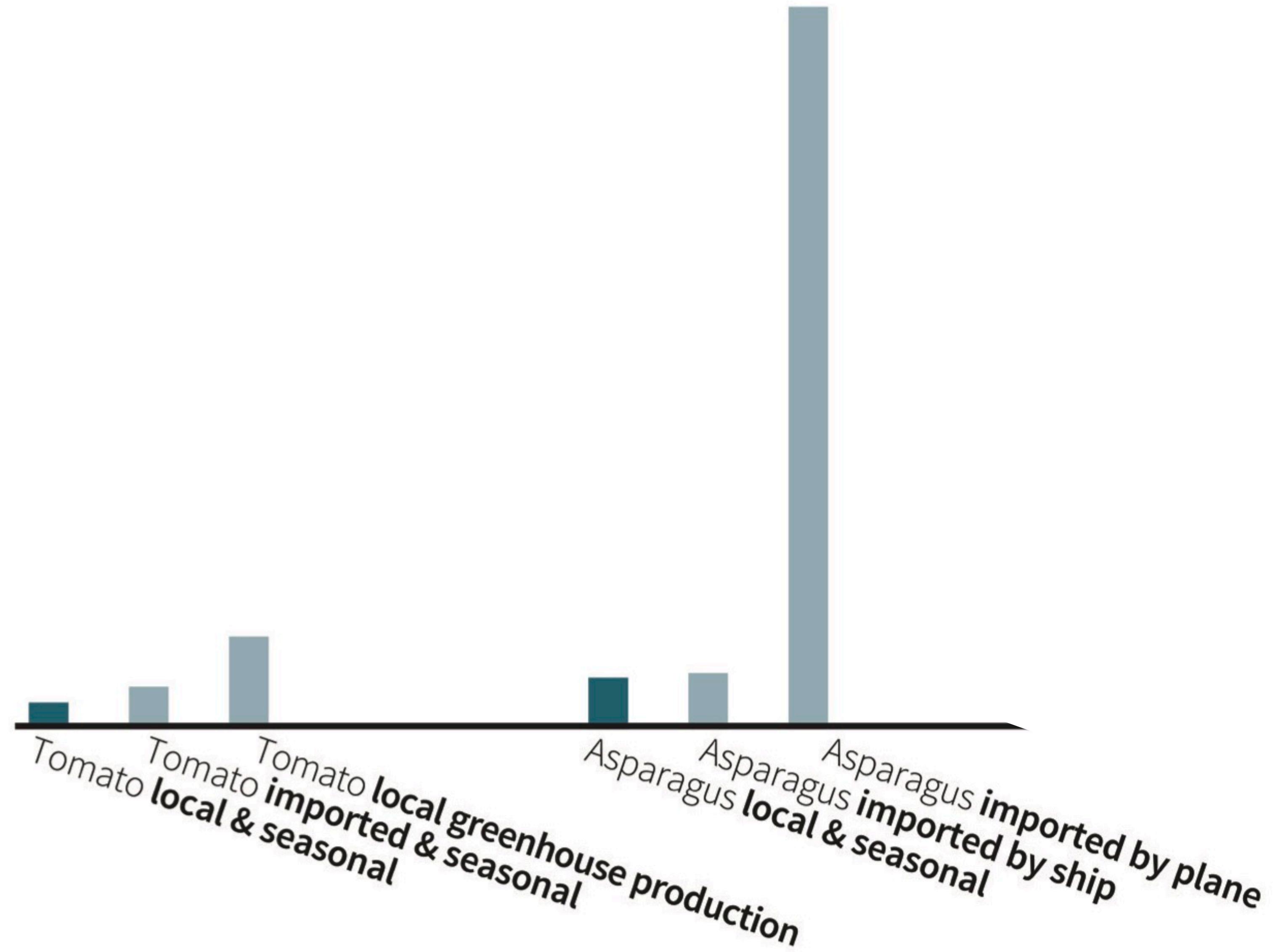


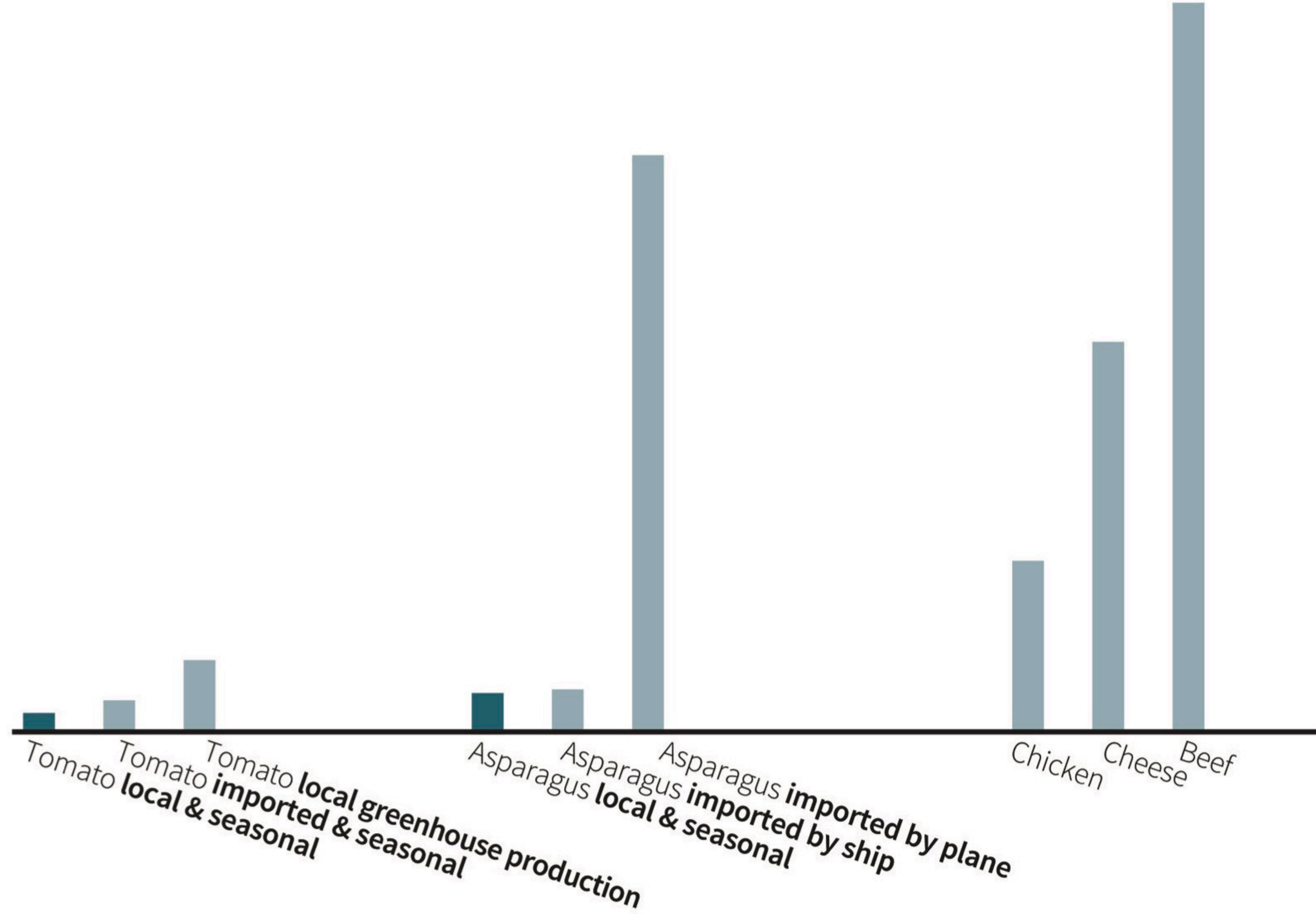
Global Issue
Relationship to Food
The Science
Solutions

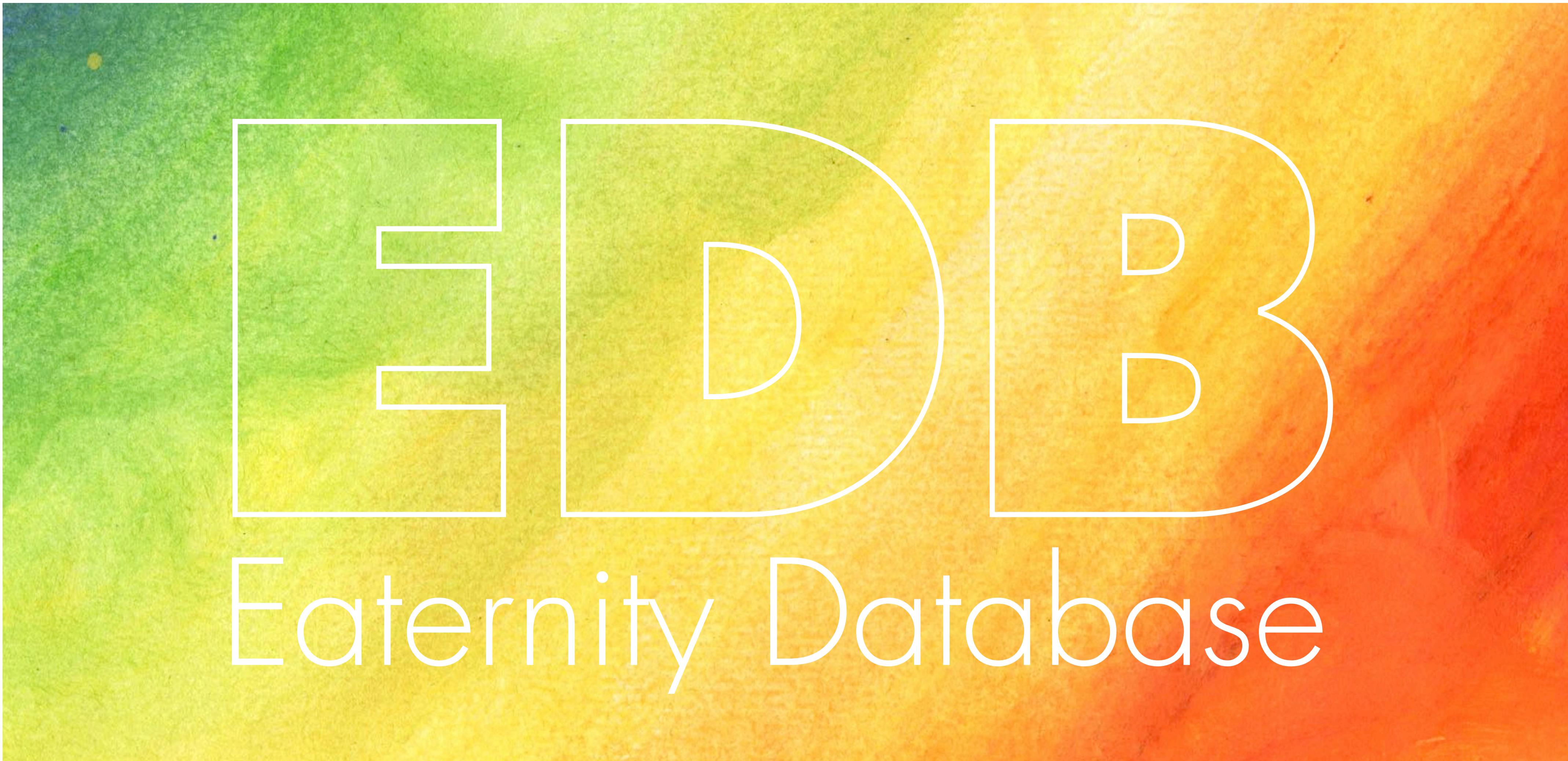












5
D
B

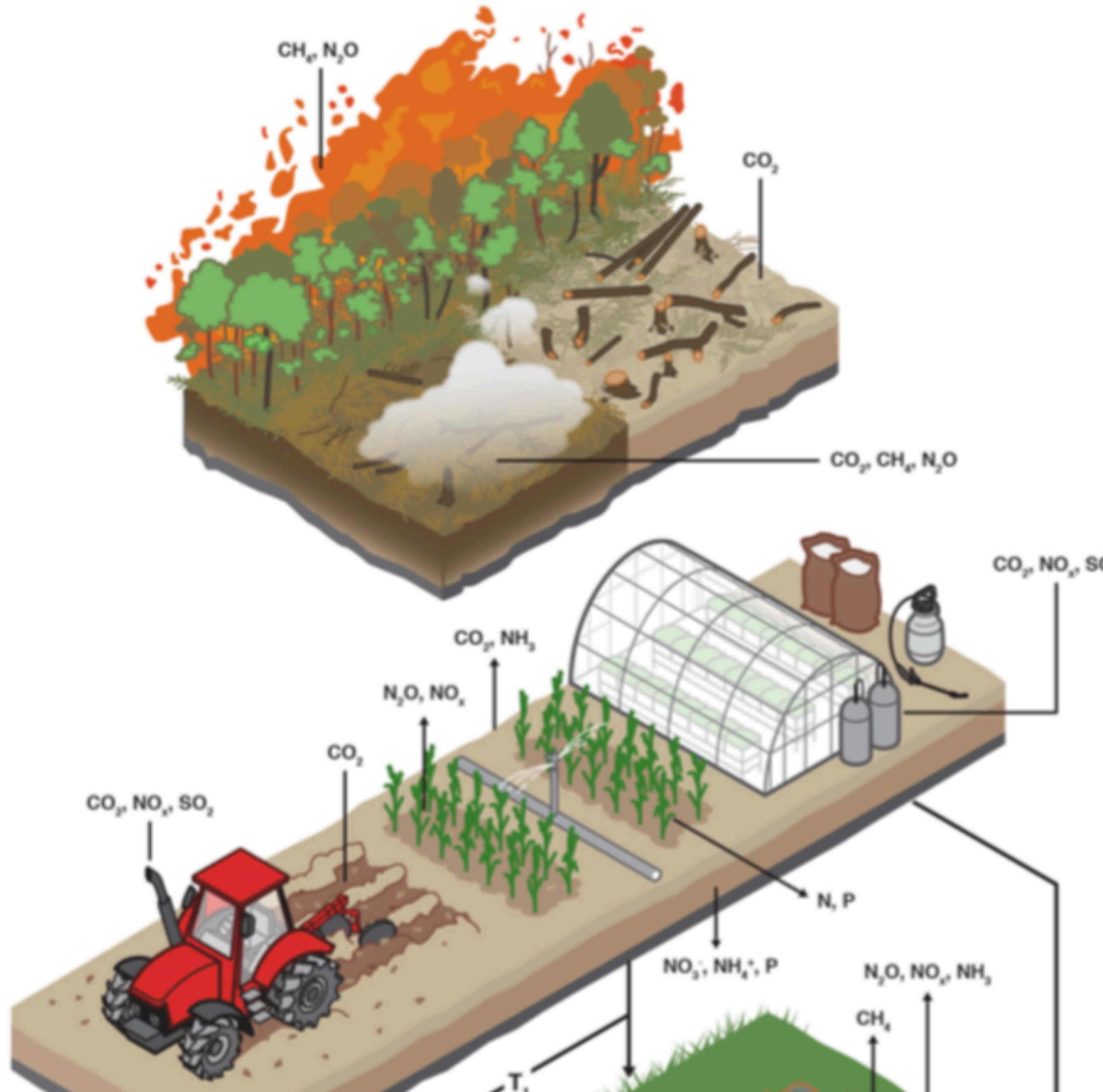
Eaternity Database



Route Transport service 2

Schließen

Karte**Satellit**



Included

Land Use Change

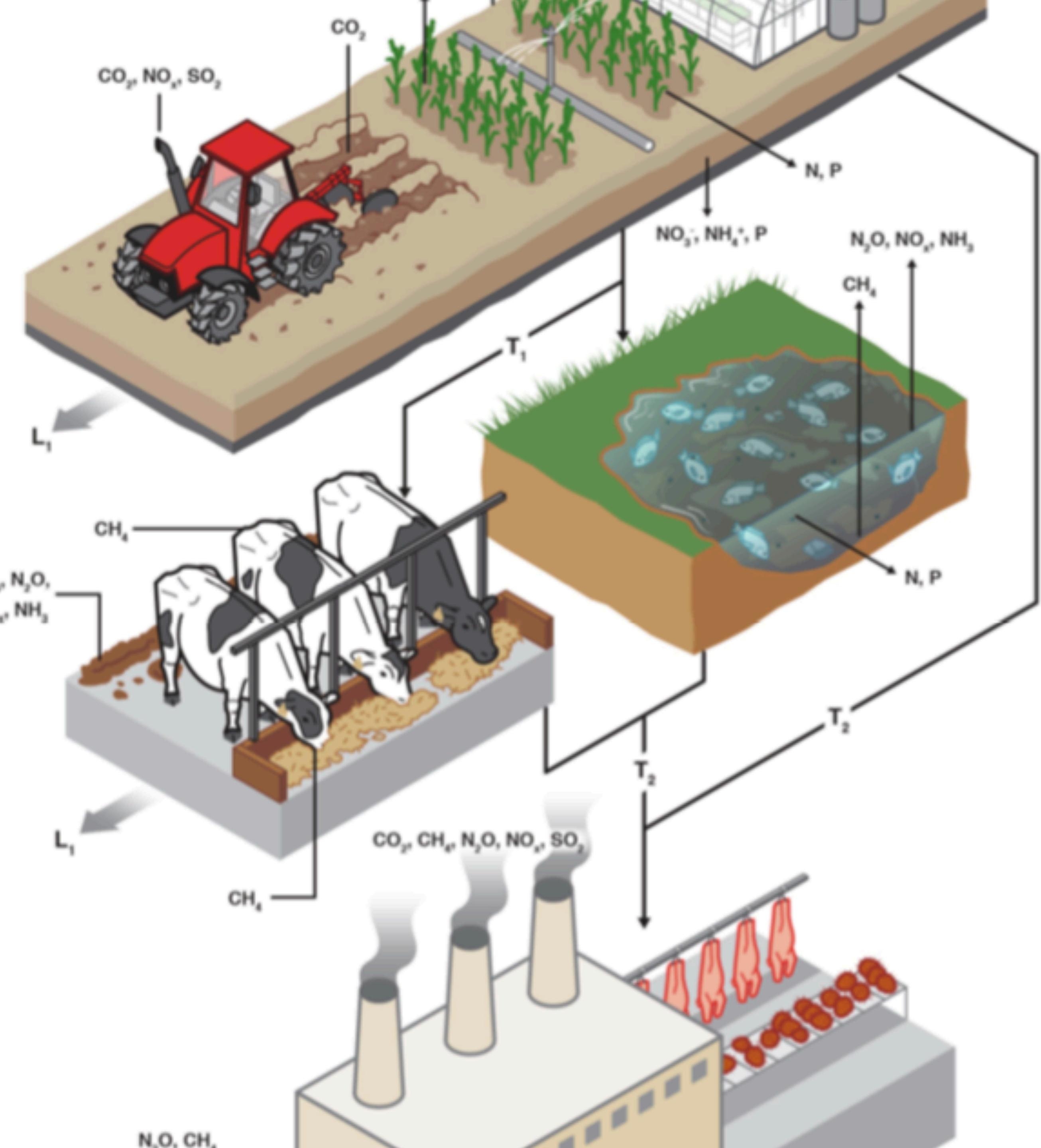
- Above ground C stock change (CO₂)
- Below ground C stock change (CO₂)
- Forest burning (CH₄, N₂O)
- Organic soil burning (CO₂, CH₄, N₂O)

Excluded

- Leaching, runoff and induced non-CO₂ emissions

Crop Production

- Seed & nursery
 - Inputs production
 - Machinery
 - Greenhouse & trellis infrastructure
 - Electricity & fuel
 - Fertilizer & retained crop residue (N₂O, NH₃, NO_x, NO₃, NH₄⁺, P, N)
 - Urea & lime (CO₂)
 - Flooded rice (CH₄)
 - Residue burning (CH₄, N₂O, NH₃, NO_x)
 - Cultivation of drained organic soils (CO₂, N₂O)
 - Drying / grading
 - Irrigation water consumption
 -
 - Land use: seed; fallow; arable and permanent crops
- Soil emissions (CH₄)
 - Organic fertilizer application (CH₄)
 - N fixation emissions
 - C sequestration in crop residue
 - Runoff (N)
 - Residue burning indirect emissions (N₂O)
 - Human labour



- (N_2O , NH_3 , NO_x , NO_3^- , NH_4^+ , P , N)
 - Urea & lime (CO_2)
 - Flooded rice (CH_4)
 - Residue burning (CH_4 , N_2O , NH_3 , NO_x)
 - Cultivation of drained organic soils (CO_2 , N_2O)
 - Drying / grading
 - Irrigation water consumption
 -
 - Land use: seed; fallow; arable and permanent crops

Livestock/Aquaculture

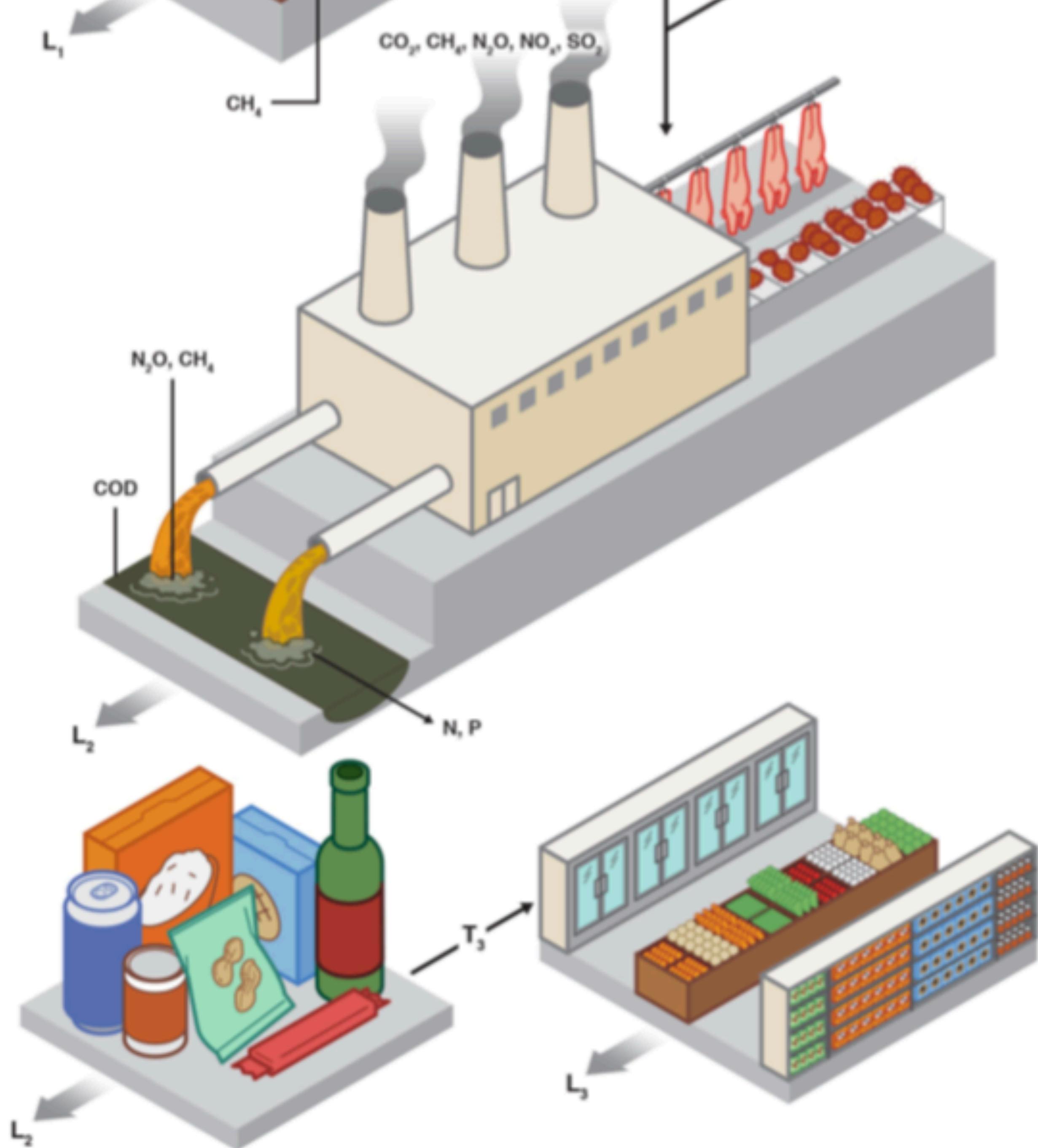
- Pasture management (same as for food/feed)
- Feed processing
- Housing energy use
- Enteric fermentation (CH_4)
- Manure management (N_2O , NO_x , NH_3 , CH_4)
- Aquaculture ponds (N , P , N_2O , NO_x , NH_3 , CH_4)
- Drinking & service water
-
- Land use: permanent pasture; temporary pasture; aquaculture ponds

- Runoff (N)
- Residue burning indirect emissions (N_2O)
- Human labour

Processing

- Energy (CO_2 , NO_x , SO_2)
- Wood burning (CH_4 , N_2O , NO_x , SO_2)
- Wastewater (CH_4 , N_2O , P , N , COD)
- Incineration (CH_4 , N_2O , NO_x , SO_2)
- Processing water consumption

- Infrastructure
- Pasture residue (emissions or burning)
- Pasture N fixation emissions
- Pasture runoff (N)
- Manure management (P)
- Human labour



Processing

- Energy (CO_2, NO_x, SO_2)
- Wood burning (CH_4, N_2O, NO_x, SO_2)
- Wastewater (CH_4, N_2O, P, N, COD)
- Incineration (CH_4, N_2O, NO_x, SO_2)
- Processing water consumption

- Miscellaneous inputs
- Human labour
- Infrastructure
- Land use

Packaging

- Materials
- Material transport
- End of life disposal

- Human labour
- Infrastructure
- Land & water use

Retail

- Energy use

- Human labour
- Infrastructure
- Land & water use

Losses

L_1 - Storage and transport

L_2 - Processing and packaging

L_3 - Wholesale and retail

Transport
(CO_2, NO_x, SO_2)

T_1 - Feed

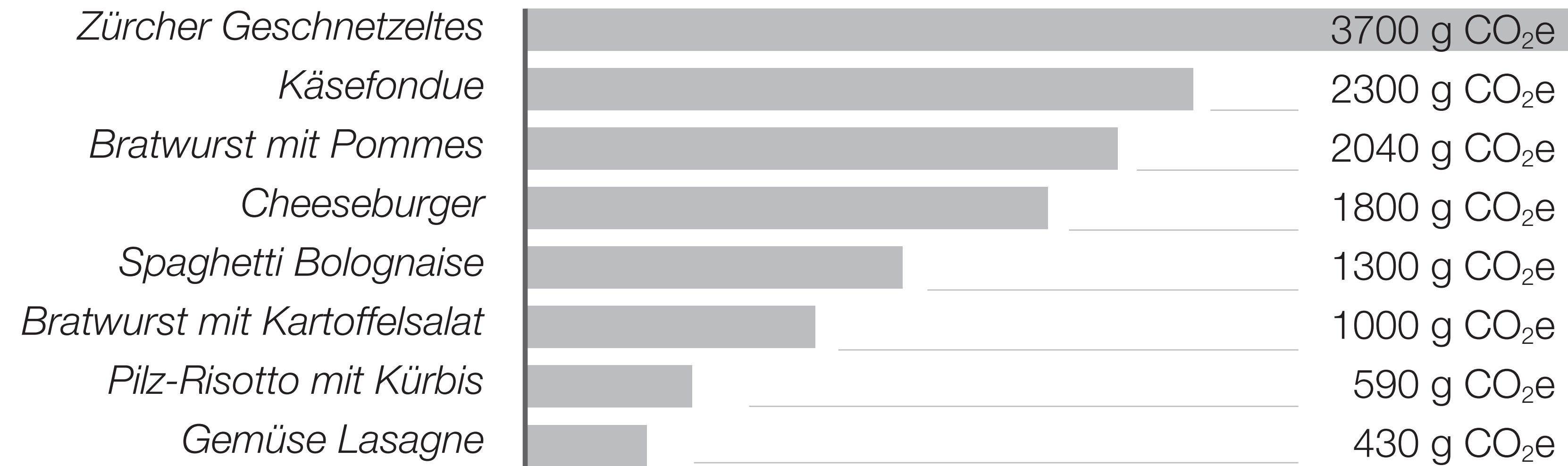
T_2 - Food

T_3 - Processed food



Die Klimabilanz von Cheeseburger, Fondue und Co.

pro Menu:



Global Issue
Relationship to Food
The Science
Solutions



APPETITE

for change?



**ICH ESSE
DIE WELT
GESUND!**

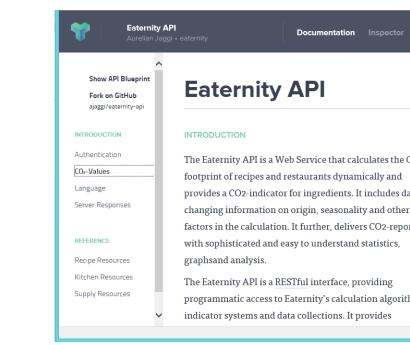
Genieße ein klimafreundliches
Menu und leiste damit
deinen Beitrag für eine
gesunde Welt.



Eaternity API Connection

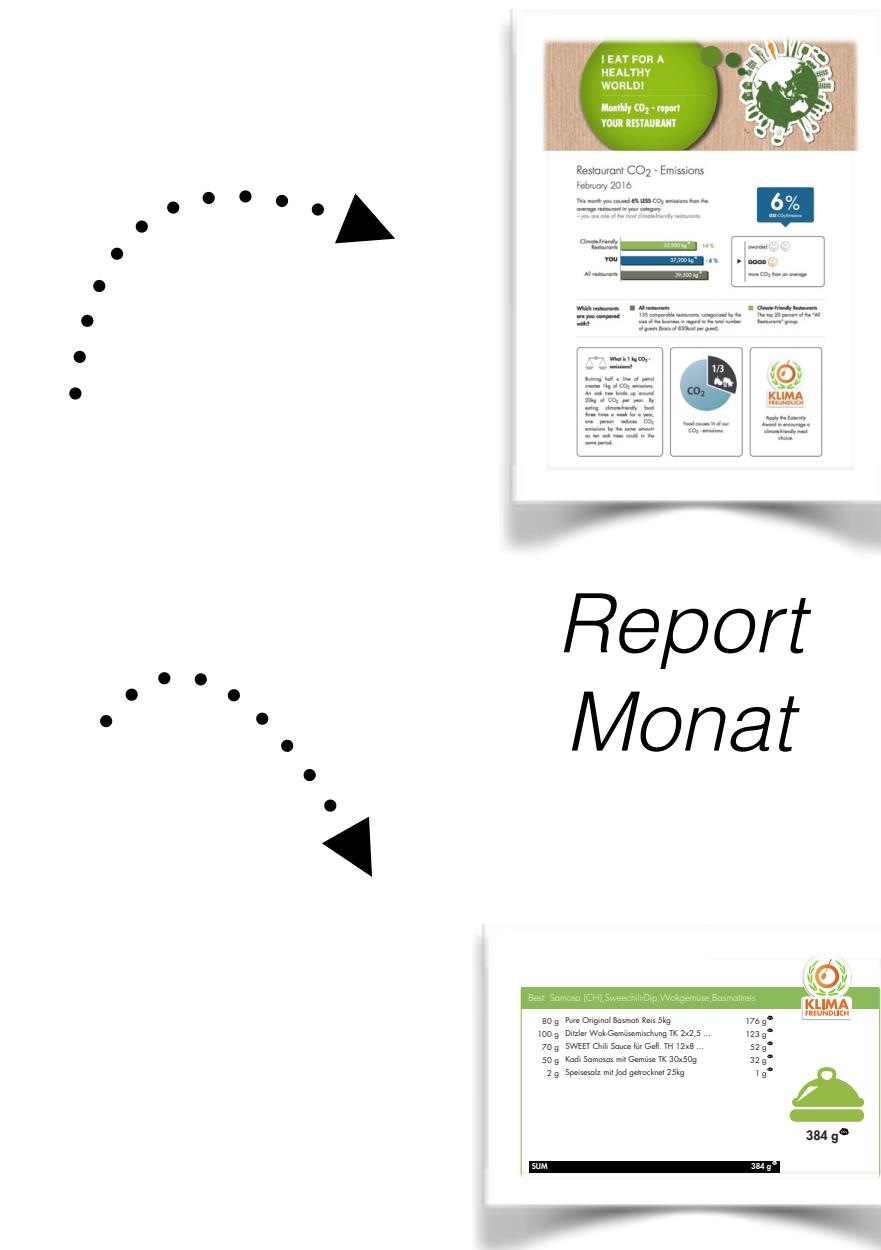


*
Rezept
**
Bestellung



Eaternity API

Developer documentation: <http://docs.eaternitycloud.apiary.io>



*	<i>Artikelname + EAN</i>
	<i>Menge</i>
	<i>Datum</i>
	<i>Kunden-ID</i>

**	<i>Artikelname + EAN</i>
	<i>Menge</i>
	<i>Datum</i>
	<i>Kunden-ID</i>

We link all of your
ingredients to our data.



**CLIMATE
FRIENDLY**

6%
LESS CO₂-Emissions

awarded ☺ ☺

GOOD ☺

more CO₂ than an average



This restaurant
37,200 kg^{CO₂}

All restaurants
39,500 kg^{CO₂}



∅ meals of this restaurant
1,930 g^{CO₂}



∅ meals of all restaurants
1,715 g^{CO₂}

∅ climate-friendly meals
528 g^{CO₂}





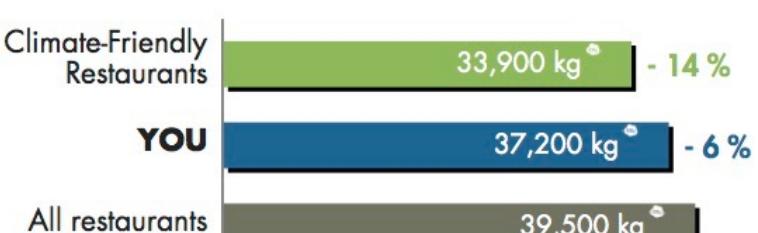
I EAT FOR A
HEALTHY
WORLD!
Monthly CO₂ - report
YOUR RESTAURANT

Restaurant CO₂ - Emissions

February 2016

This month you caused **6% LESS** CO₂ emissions than the average restaurant in your category
– you are one of the most climate-friendly restaurants.

6%
LESS CO₂-Emissions



► awarded
GOOD
more CO₂ than an average

Which restaurants
are you compared
with?

All restaurants
135 comparable restaurants, categorized by the size of the business in regard to the total number of guests (basis of 830kcal per guest).

Climate-Friendly Restaurants
The top 20 percent of the "All Restaurants" group.

What is 1 kg CO₂ - emissions?

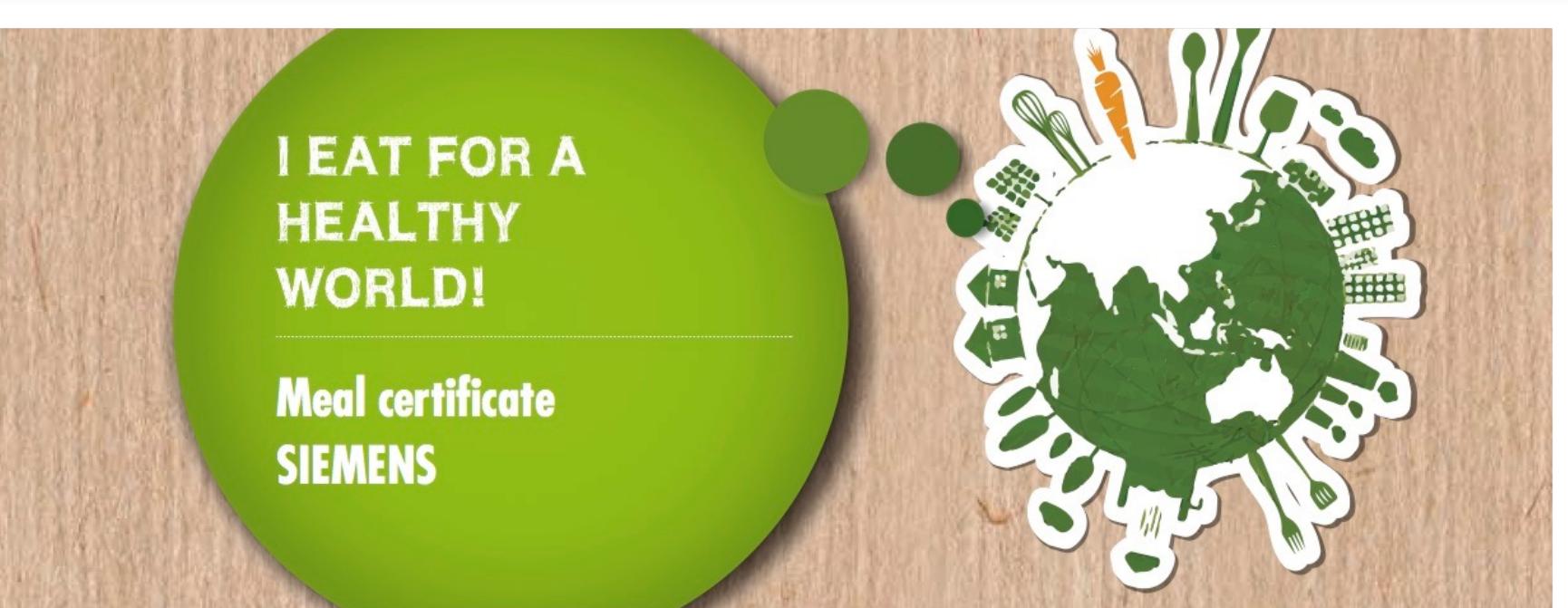
Burning half a litre of petrol creates 1kg of CO₂ emissions. An oak tree binds up around 20kg of CO₂ per year. By eating climate-friendly food three times a week for a year, one person reduces CO₂ emissions by the same amount as ten oak trees could in the same period.

1/3
CO₂

Food causes 1/3 of our CO₂ - emissions.



Apply the Eaternity Award to encourage a climate-friendly meal choice.



I EAT FOR A
HEALTHY
WORLD!
Meal certificate
SIEMENS

Meal CO₂ - Emissions

February 2016



Take notice of the Eaternity Award
when you choose your meal.



∅ climate-friendly meals

528 g



∅ meals of this restaurant ∅ meals of all restaurants

1,930 g **1,715 g**



Meals are awarded as climate-friendly if they belong to the top 20% of all meals being served. In this restaurant the climate-friendly meals have **69% LESS** CO₂ than the average meal.





Eaternity App

The screenshot shows a web browser window for eaternity.org. On the left, a recipe card for "THE DELIGHTFUL CLASSIC" is displayed. The card includes a thumbnail image of a dessert, the title, and a list of ingredients with their quantities:

Zutaten	Item	Quantity
	Cashews (India/organic)	88 g
	Coconutoil (organic)	33 g
	Yeast	2.5 g
	Rose crystal salt	2.5 g

An "Add new row" button is located at the bottom of the ingredient list.

On the right, a large modal window titled "Sustainability Rating" provides environmental data for the recipe. The data is presented in a grid format:

Category	Value
Climate	565 g CO ₂
Water	845 liter
Animal Welfare	vegan
Rainforest	protected

Below the grid, there are sections for "VALUES PER PORTION" and various metrics with corresponding icons:

- Costs: € 5.99
- Nutrients: 670 kcal
- Allergens: Cashews
- Climate: CO₂ (five icons)
- Water: Water droplets (five icons)
- Environment: Cow, tree, sun, location, heart (five icons)
- Weight: 125 g

app.eaternity.ch



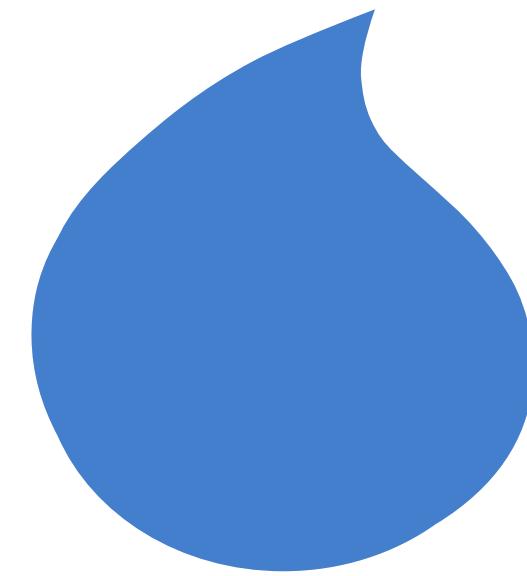
Climate Score



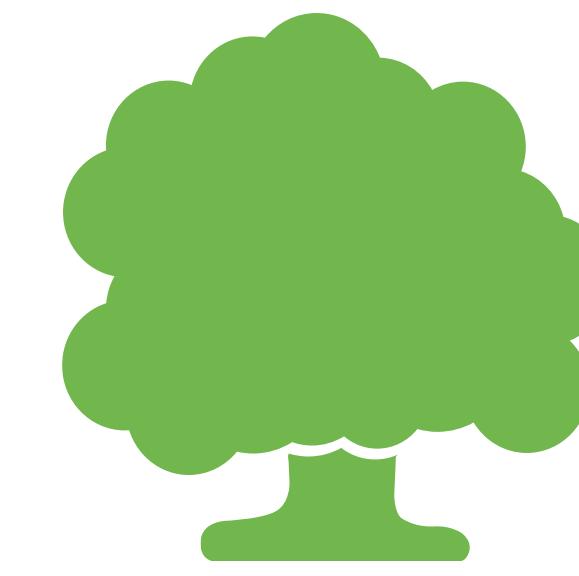
Vita
Score



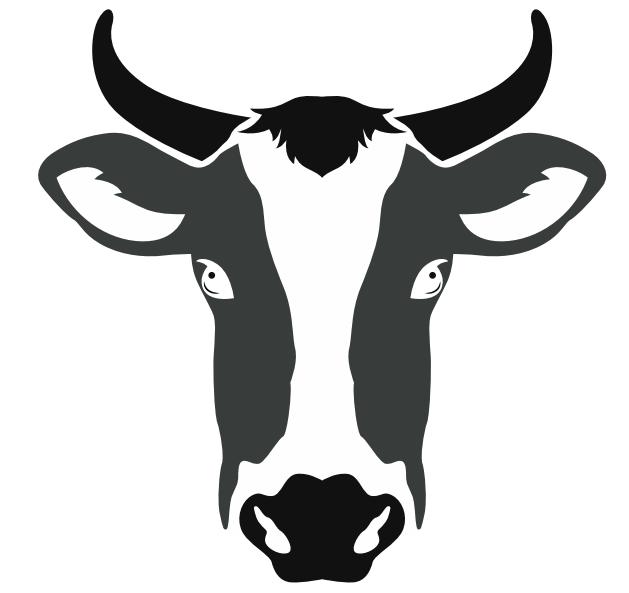
Nutritional
Balance



Scarce
Wasser



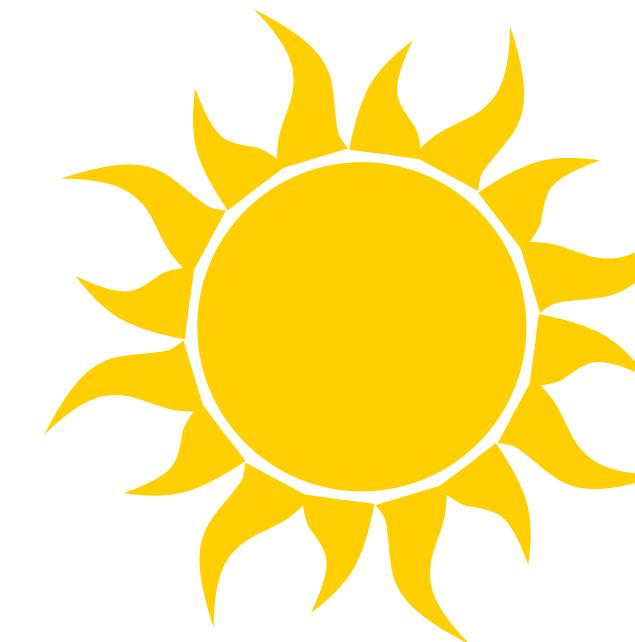
Rainforest



Animal
Treatment

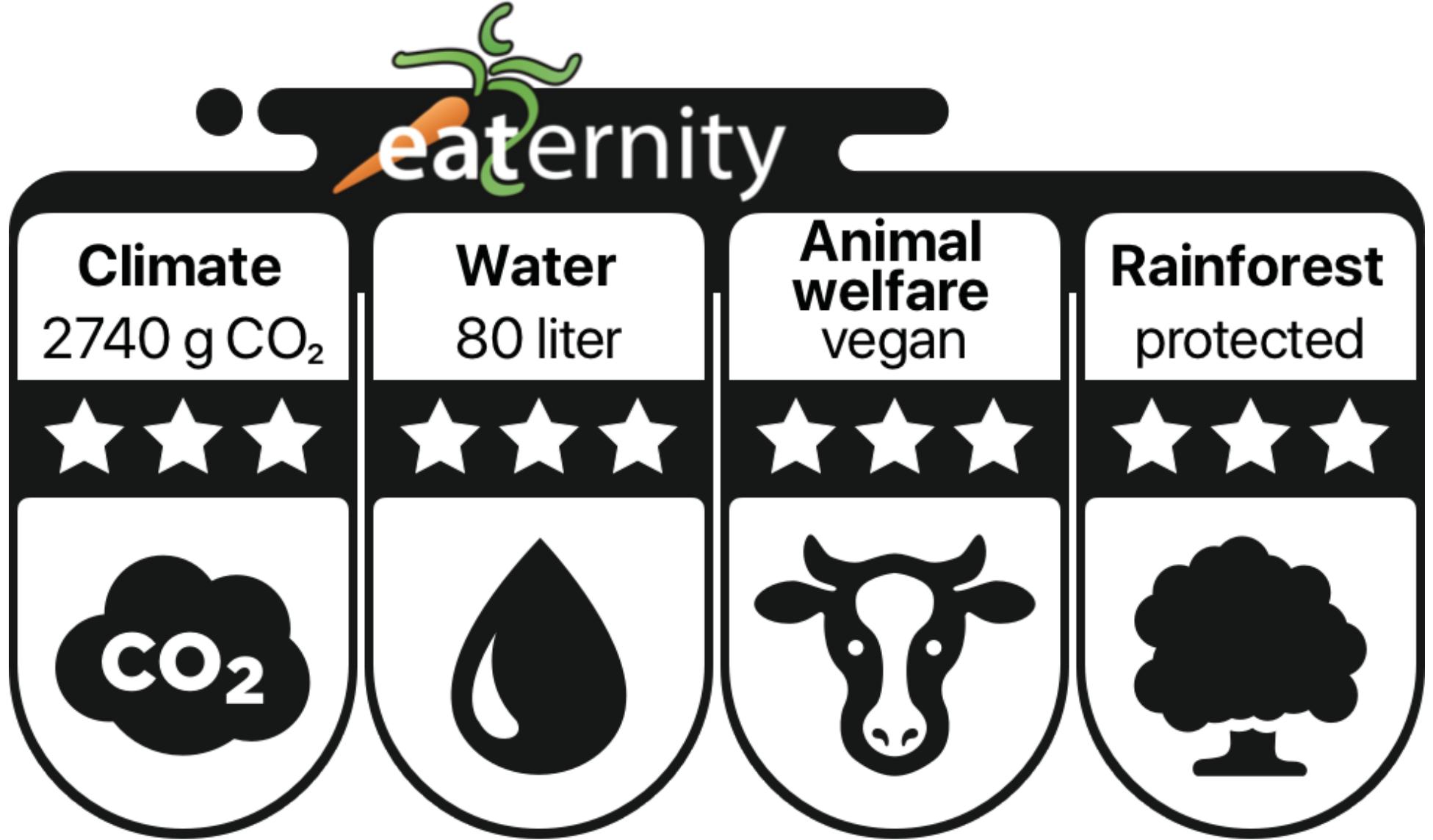


Regional



Seasonal

Retail



Product score and label: Veganz - since 2019

Retail



The image displays three screenshots of the Codecheck app interface, showing the product details for "Vegan - White Roasted Almond".

Screenshot 1 (Left): Shows the barcode scanning screen with a search bar at the top and a barcode area in the center. A message says "Scanne die Nachhaltigkeits-Bewertung von Eaternity mit codecheck". The bottom status bar shows "GS1" and "Scanning by SCANDIT".

Screenshot 2 (Middle): Shows the detailed product information screen. At the top, it says "Klima Score pro 100g/ ml" with a green checkmark and the text "gering" and "499 g CO₂ äq.". Below this, under "Lebens- und Ernährungsweise", there are five categories: "Glutenhaltig" (unchecked), "Lactose: Keine Einschätzung möglich" (unchecked), "Vegan" (checked), and "Vegetarisch" (checked). There is also a "Mehr Informationen" button. Under "Labels und Gütesiegel", there is a "Bio-Siegel" icon.

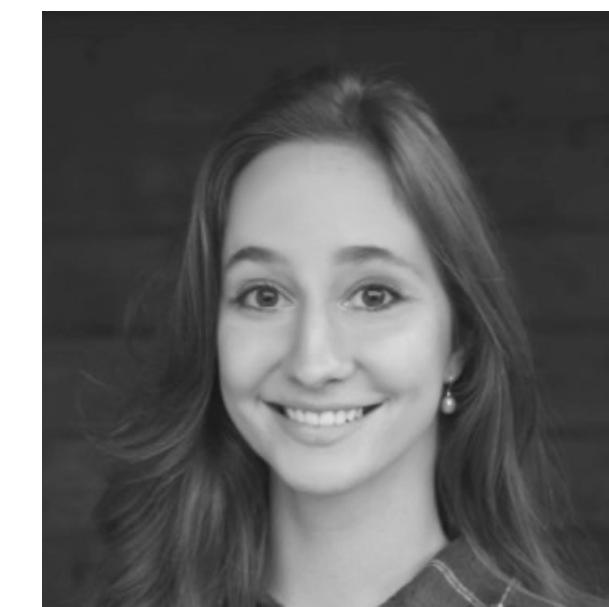
Screenshot 3 (Right): Shows the breakdown of the climate footprint. It starts with a note: "Die Berechnung erfolgt über die Zutaten des Produktes 'Vegan - White Roasted Almond'. Dazu wurden jeweils Annahmen über die Herkunft, die Transportwege sowie die Menge getroffen." Then it lists the ingredients with their CO₂ emissions per 100g:

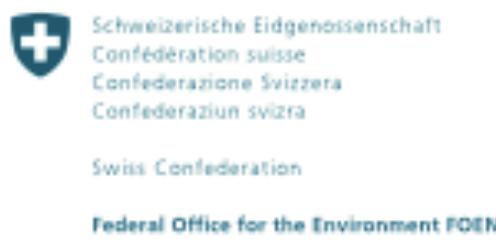
Menge	Inhaltsstoff	CO ₂ äq
35 g	Rohrzucker Paraguay	28,63 g
28 g	Kakaobutter Peru/Dominikanische Republik	37,68 g
21 g	Mandeln Türkei/USA	45,51 g
16 g	Inulin Mexiko	71,80 g
0 g	Meersalz Spanien	0,12 g
0 g	Vanille gemahlen Madagaskar	0,17 g
Produktion + Transport nach Deutschland		30,91 g
100 g	Gesamtmenge	214,82 g

At the bottom, it says "Die Daten wurden vom Hersteller bereitgestellt und kontrolliert. Eaternity hat diese" and has a "Gesamtmenge" button.

Example: Scan barcode with Codecheck App - 2019







n|w

Fachhochschule
Nordwestschweiz



zhaw

ENGAGEMENT
EIN FÖRDERFONDS DER MIGROS-GRUPPE

AXA Innovation Award /



↗ ↘ ↙ KTI – Start-up und Unternehmertum,
F&E-Projektförderung, WTT-Support



Spinoff

ETHzurich

VENTURE KICK



EQUI-TABLE

ERNST GÖHNER STIFTUNG

GDI

**GOTTLIEB DUTTWEILER
INSTITUTE**

— GEBERT RÜF STIFTUNG —
WISSENSCHAFT.BEWEGEN



INSEAD

seif



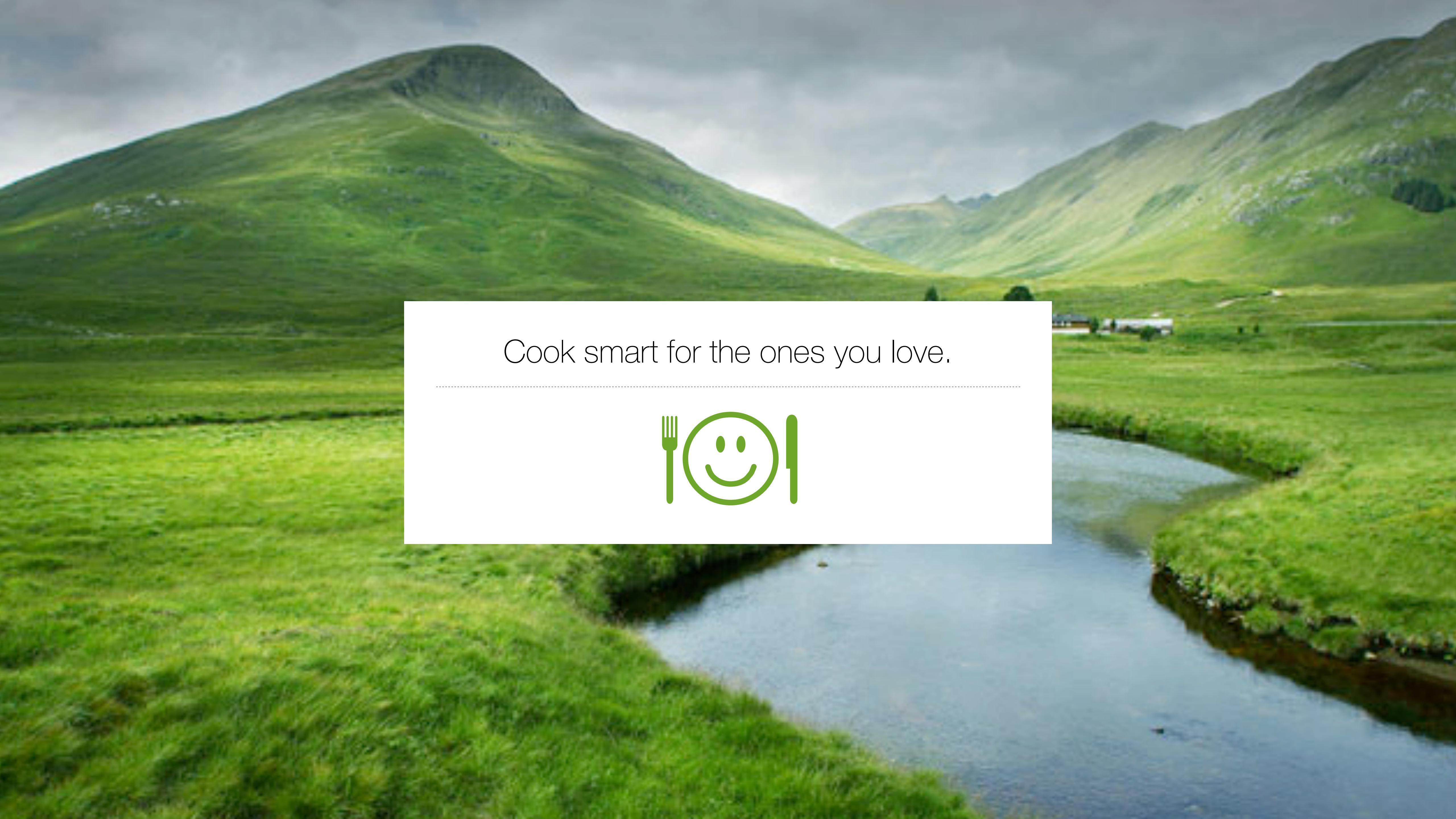


**Let's take responsibility,
because we can.**



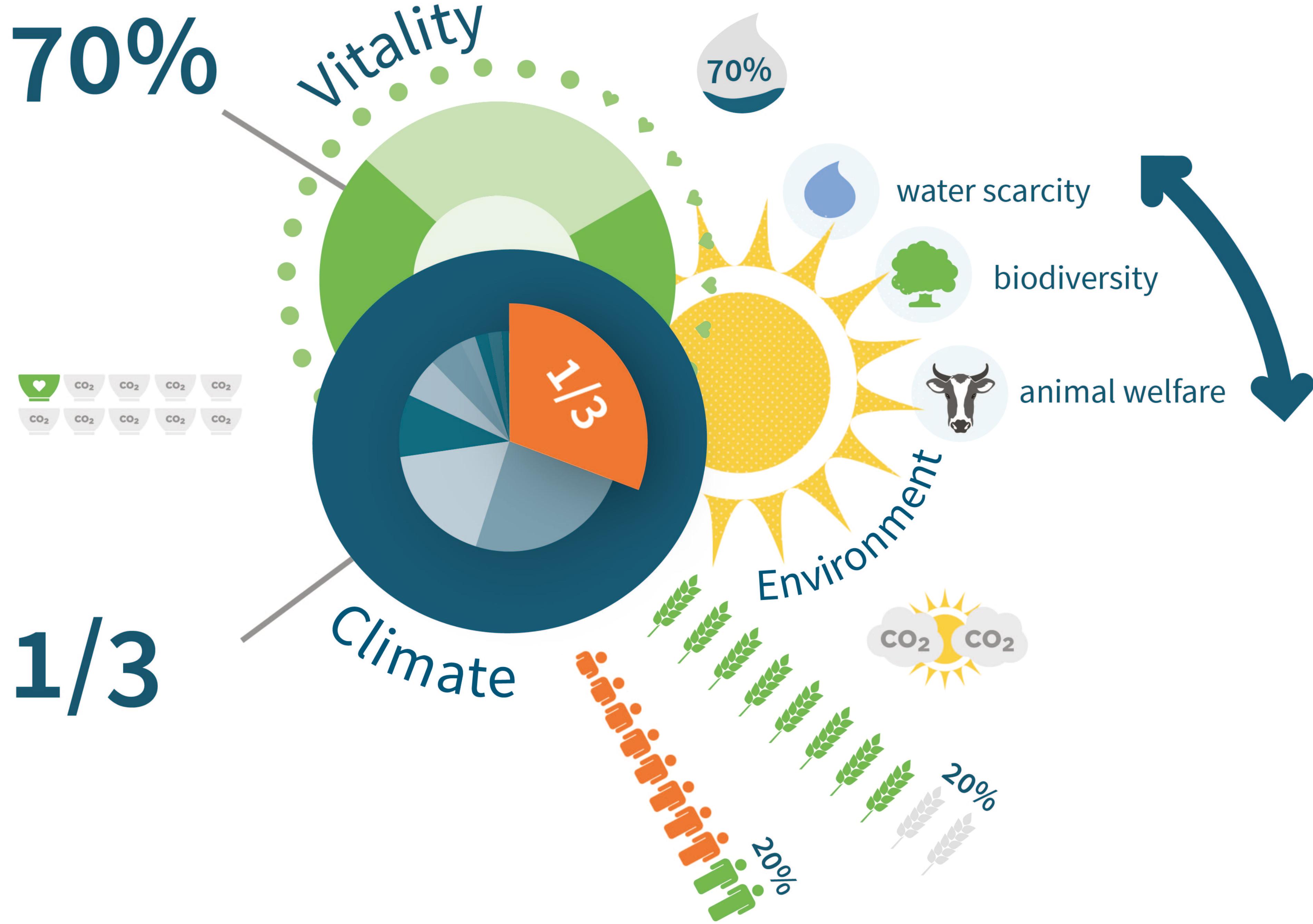
3 climate-friendly meals per week =

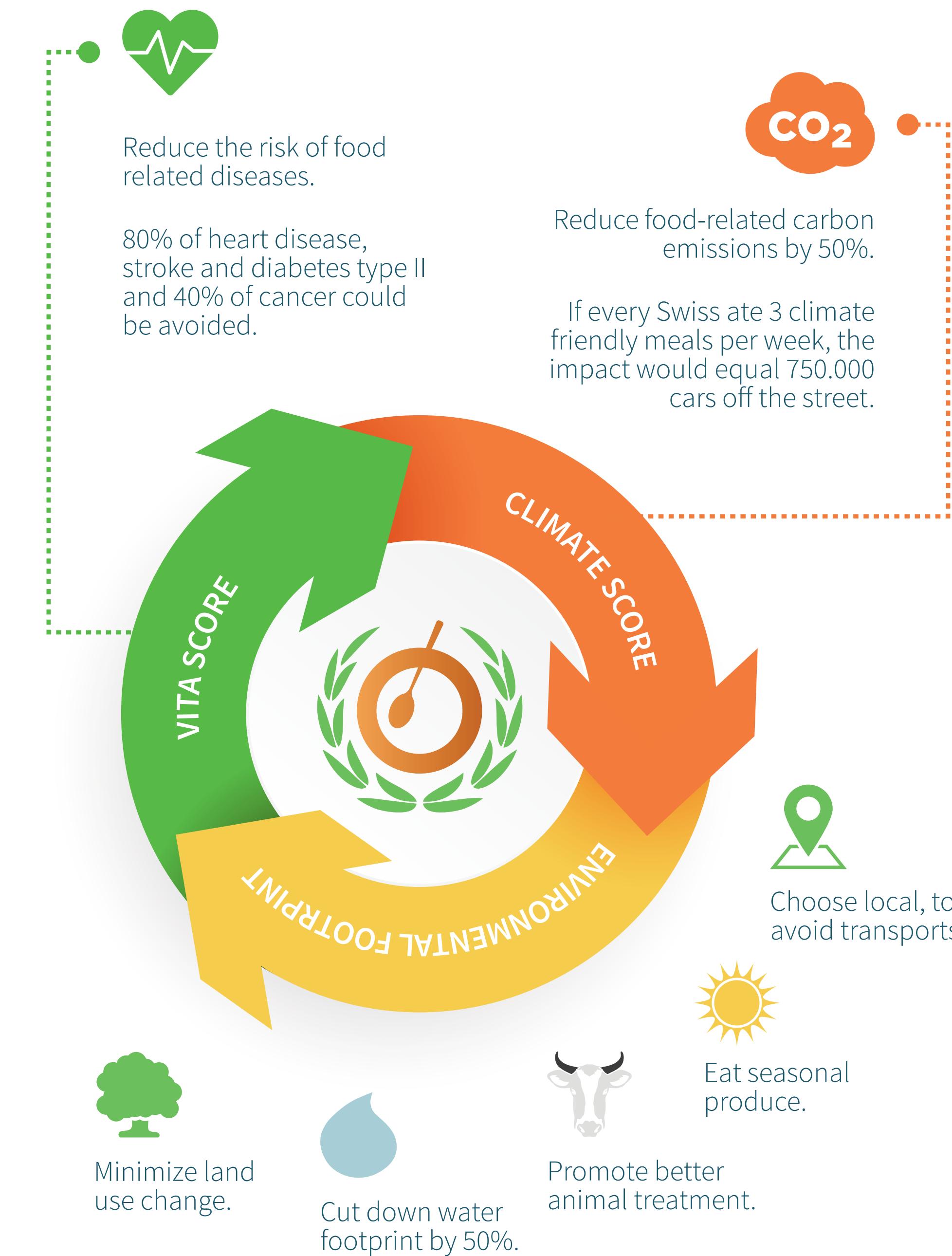
1 Billion Tons less of CO₂
a year



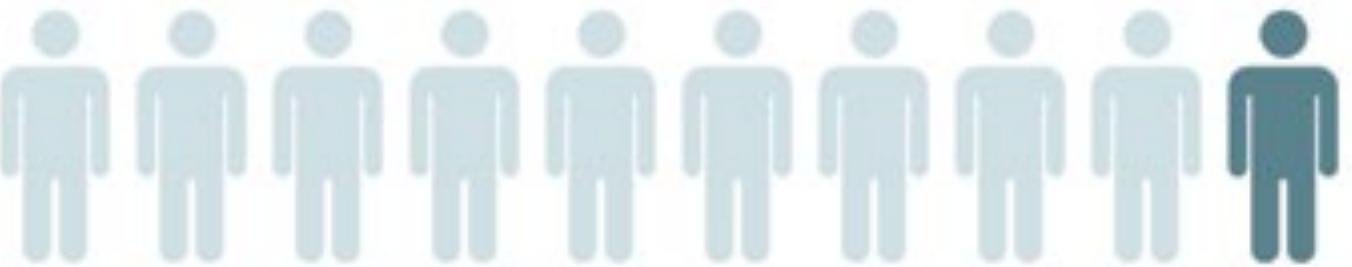
Cook smart for the ones you love.







Water Scarcity



663 million people in the world live without clean water.

Water scarcity affects humanity and the ecosystem.

Humans travel long distances for fresh water.

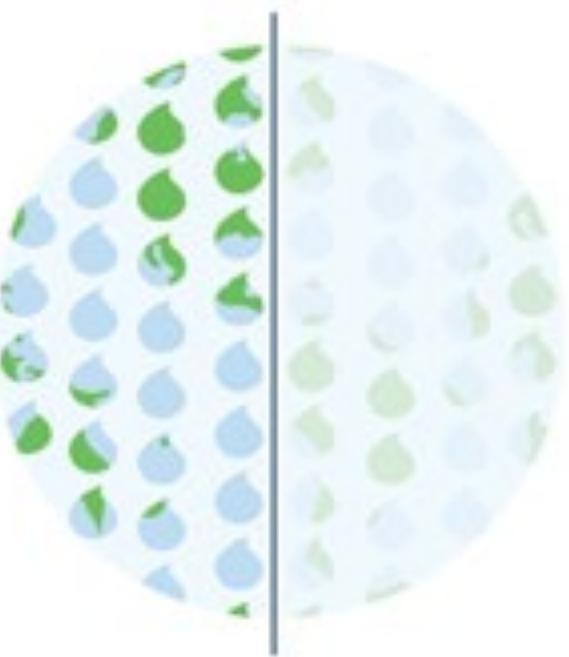
LABOR

Poor water quality is a disease risk.

HEALTH

Fresh water supply is needed to grow food.

FOOD



To help we need to reduce world wide dependency on scarce water by 50%.



We use
182 liter
scarce water
/ day / person
globally



We have
91 liter
scarce water
/ day / person
globally

Scarcity is different per region.

Switzerland

0.01



Spain

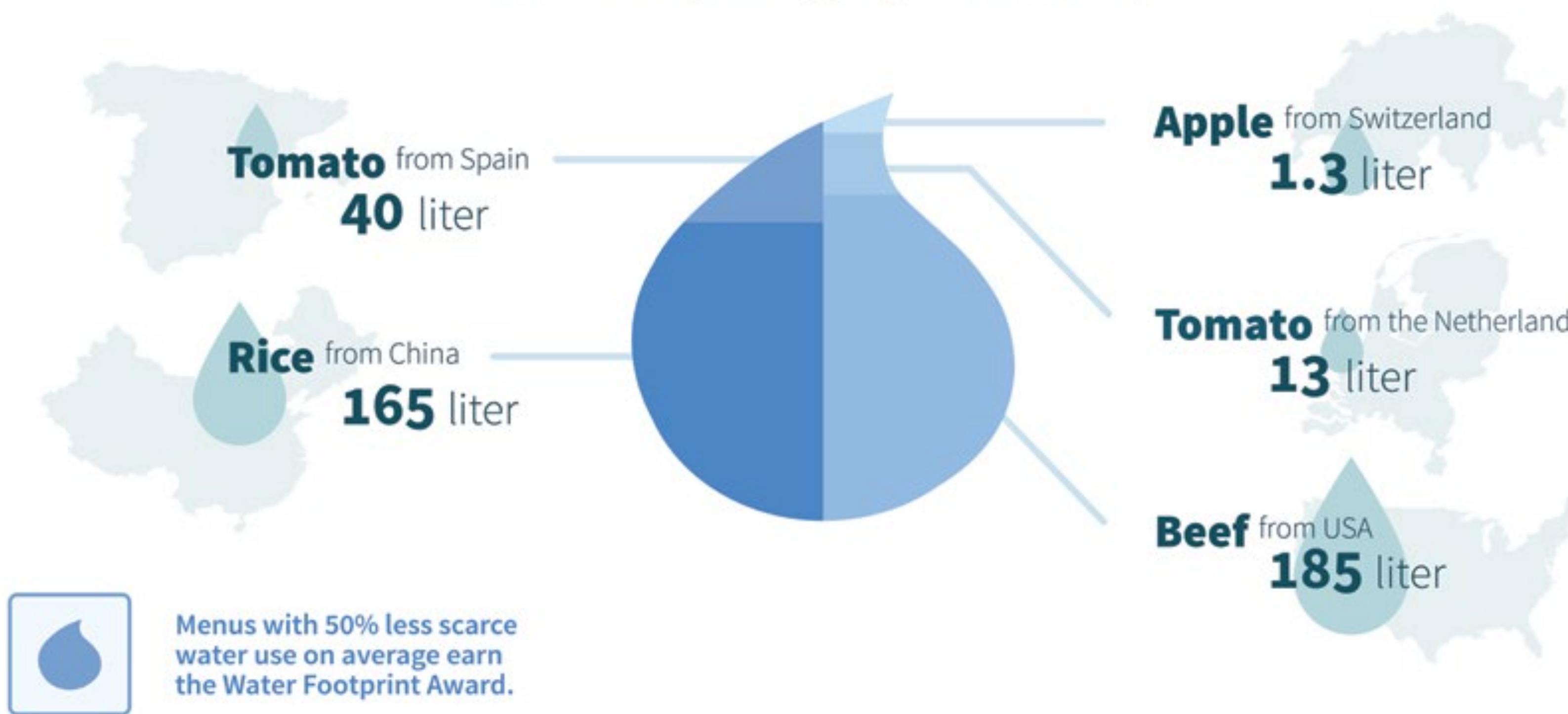
0.63



Water demand for produce



Water scarcity strongly depends on locality.



Nutrition

671 Million people are obese, making obesity the number one health problem in the world. Direct results are: diabetes, cardiovascular diseases, cancer, joint injuries among others.

At the same time **795 Million people** suffer from hunger.

A balanced diet secures the means to live healthy without wasting food along the way.



Balanced menus with a good energy value score the Nutrition Label.

A balanced meal has an energy value of **450-850 kcal** distributed:



Health

Current health recommendations disregard climate change.



Using existing indicators for meals, only 30% were both healthy and climate friendly.



229 Million disability adjusted Life Years are lost due to unhealthy diets worldwide.



CARDIOVASCULAR



DIABETES



CANCER

Your diet related risk for:
Cardiovascular, Diabetes, Cancer
differs per country, age and gender.

WHAT IS DALY?

DALY

Disability Adjusted Life Year is a measure of overall disease burden, expressed as the cumulative number of years lost due to ill-health, disability or early death.

$$= \text{YLD} \text{ Years Lived with Disability} + \text{YLL} \text{ Years of Life Lost}$$



VitaScore

A NEW APPROACH. Meal related risk indicator based on the Global Burden of Disease project's results.



Menus with at least 20% less diet related risk points earn the Vita Score Award.

Dietary Risk Factors

Each meal counts. We look at 8 diet related risk factors. Better ingredients score less risk points.



Diet low in Whole Grains
between 100 g and 150 g per day



Diet low in Fruits
between 200 g and 300 g per day



Diet low in Nuts and Seeds
between 16 g and 25 g per day



Diet high in Salt
between 1 g and 5 g per day



Diet low in Vegetables
between 290 g and 430 g per day



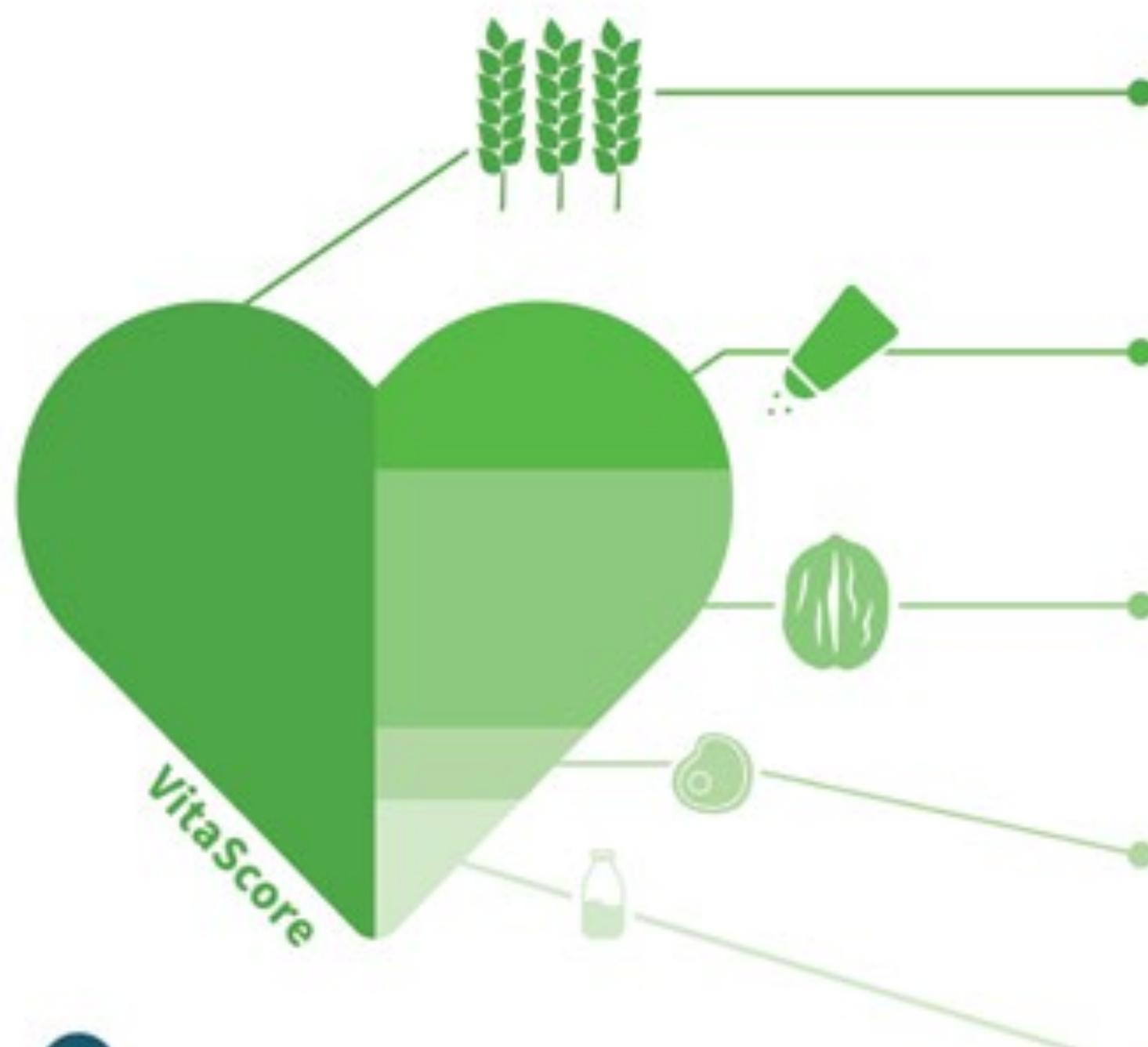
Diet high in Processed Meat
between 0 g and 4 g per day



Diet high in Red Meat
between 16 g and 25 g per day



Diet low in Milk
between 350 g and 520 g per day



Whole grains

64.4 DALY

28.7 DALY

Salt

0.63 DALY

16.4 DALY

1.7 DALY

Nuts and seeds

21.3 DALY

13.5 DALY

Red meat

1.7 DALY

4.6 DALY

Milk

6.48 DALY



For a Swiss woman between 15-49 years.
DALY are given per 100'000 people.

