Human Food & Pet Food Sectors Working Together to Deliver Sustainability Outcomes

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April 28, 2025, Kansas City, Missouri, USA

Agenda

- Brief introduction to OSI & IQI
- Macro trends driving the sustainability agenda in food
- Learning objectives
- Climate definitions, accounting & targets
- Case studies & lessons learned
- Benefits beyond carbon
- Q&A

PETFOOD ESSENTIALS

OSI Group, LLC

Bringing you a World of Food Solutions

From humble beginnings as a family-owned butcher shop in 1909…

- Founded by Otto Kolschowsky, a German immigrant to America, **Otto & Sons** began its journey as a family-owned butcher shop in the Chicago area.
- In **1955**, Otto & Sons was selected to be the first supplier of fresh ground beef for a start-up restaurant. By partnering and providing total solutions, we enabled this customer to become one of the largest restaurant chains in the world.
- Building on our success, the company quickly expanded across Europe and Asia Pacific in **1970s and 1980s** to become the truly global quality meat supplier we are today.

OSI Group | Overview

Headquartered In

Chicago, USA

Operations

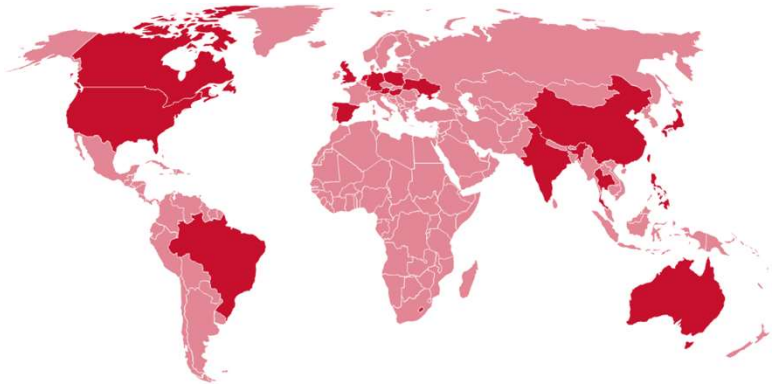
116 years in business

70 years as McDonald's supplier

80 facilities

18 countries

20,000+ employees



Americas

Canada
United States
Brazil

International

United Kingdom
Netherlands
Germany
Poland
Hungary
Ukraine
Spain
Austria
India
China
Thailand
Taiwan
Philippines
Japan
Australia

Our Mission

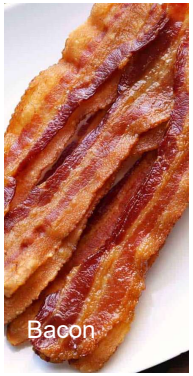
To be a trusted reliable partner to every key customer that values competitive, food safe, innovative solutions.

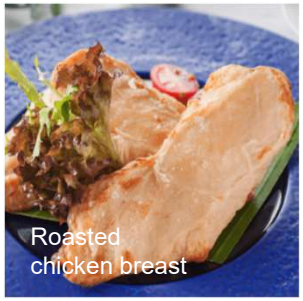
Our Values

Our core values help drive the way OSI approaches our operations

- Act with integrity
- Put people first
- ***Steward our resources for future generations***
- Seek partnering relations
- Strive to continuously improve
- Explore innovative Solutions
- Work together as a team

We are always looking to expand our product portfolio and develop better and exciting food experience in collaboration with our customers.





Resource Conservation

Responsible use of material resources: water, minerals, packaging, chemicals, etc.

Climate Change

Commitment to limit planetary warming to 1.5 deg C through our science-based climate targets

Safe & Respectful Workplaces

Team members are respected and empowered

Value Chain & Farmer Engagement

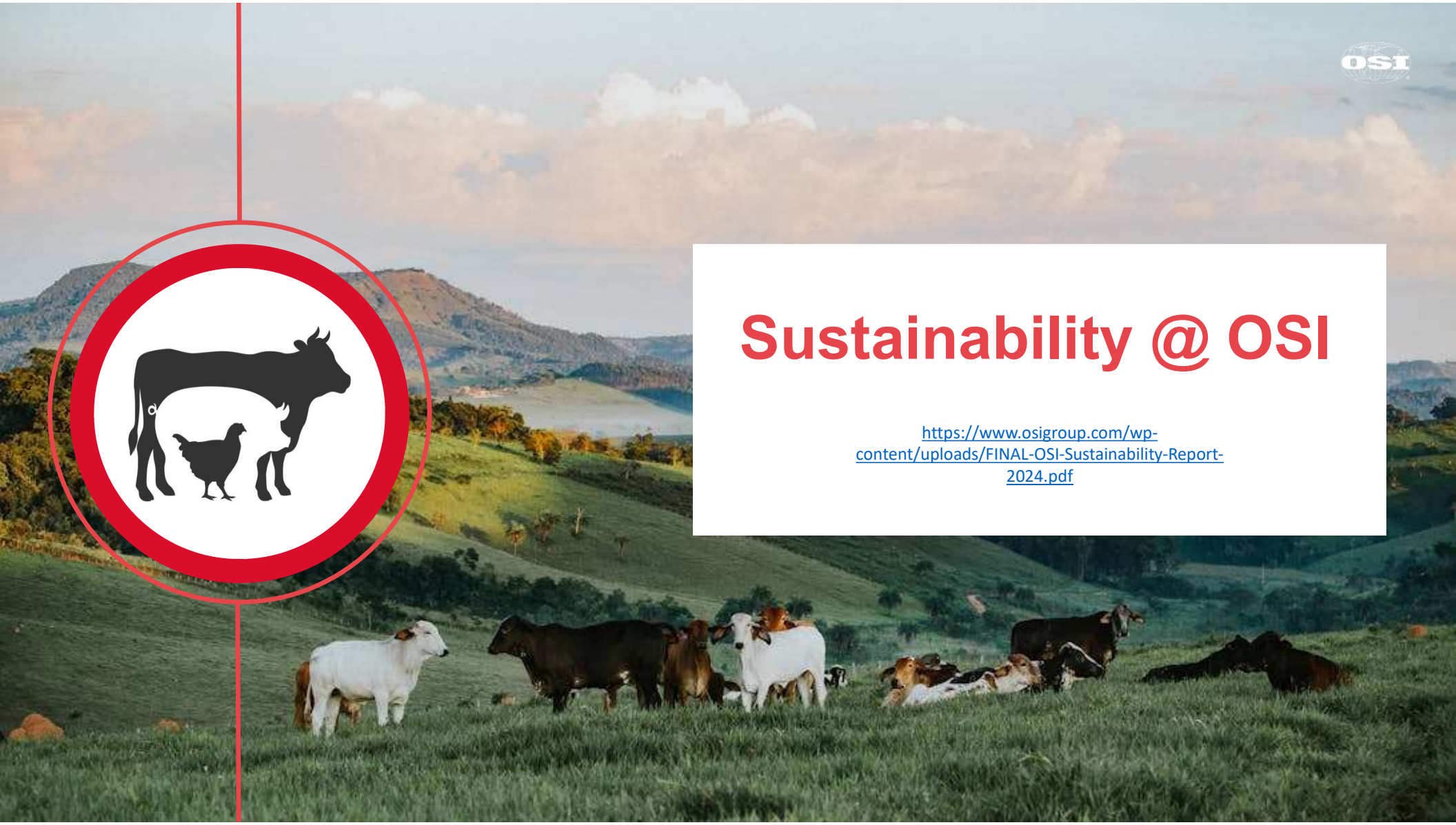
Partner across the value chain to accelerate and amplify sustainability projects

Animal Welfare

Lead in animal welfare practices for healthy animals throughout our supply chain

Communities We Serve

Produce safe, nutritious and high-quality food as responsible partners in the communities where we operate.



Sustainability @ OSI

https://www.osigroup.com/wp-content/uploads/FINAL-OSI-Sustainability-Report-2024.pdf


iQi
trusted petfood
ingredients

OUR PURPOSE

Business companion for **ingredients** that **empower** your **pet food claims**.

Where **sustainability** and **animal welfare** are common sense.

OUR SUSTAINABILITY VISION

Sustainability is becoming ever more important in the pet food industry.

We support the **sustainability transformation** in the pet food industry as a **first mover** of sustainable petfood ingredients.

IQI INGREDIENT SOLUTIONS FROM

Main animal, marine, plant protein source

IQI INGREDIENT SOLUTIONS FOR

Health & well-being claims

Sustainable pet food and certified animal welfare

Marketing claims

WE WORK ON SUSTAINABILITY BY

Contributing to SDG 8, SDG 12 and SDG 14

Realizing a minimal footprint for all of our products

Setting up a Life Cycle Assessment (LCA) for four ingredients

Taking maximum care of animal welfare with animal based ingredients

Using as many by-products as possible

Transforming our product portfolio

OUR PORTFOLIO

Global Food System Trends

WHY FOCUS ON SUSTAINABILITY?

The global food system is under intense pressure to feed a growing population, satisfy increased demand for dietary diversity with growing global wealth, and adapt our agricultural systems to a changing climate.

As a significant player in the global food system, OSI has both the reach and the scale to make meaningful impact, particularly when we leverage the collective potential of our supplier and customer partnerships.

However you look at this, there is one very simple underlying reason for all that we do…simply put, it is just the right thing to do!

Growing Population

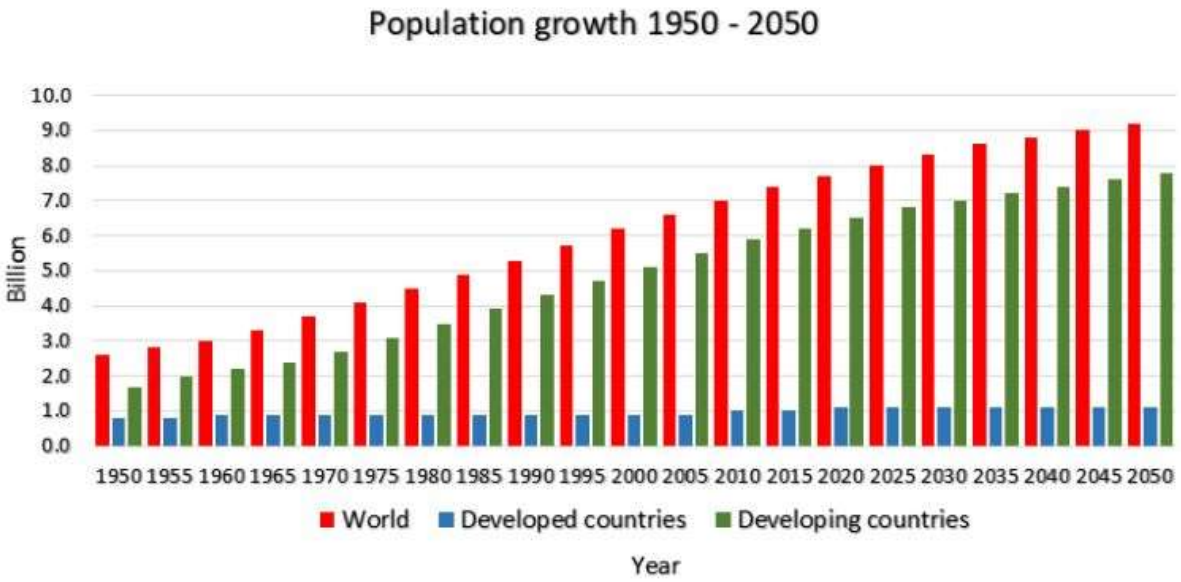


Figure 1: Population growth 1950 – 2050. Data source: Food and Agriculture Organization (FAO) and World Bank.

- Current global population is 7.6 B
- Projected to be 9.2 B by 2050
- Driven by massive growth in developing countries
- Global agricultural production needs to increase 60-70% by 2050
- Arable land per capita was 0.42 hectares in 1960
- *By 2050 it will be only 0.19*

Growing Wealth

GROWING POPULATION, SHIFTING DIETS

Total demand for food will grow along with global population in the coming decades. Projections show rising incomes and changing preferences will likely lead to shifts in diets that will be reflected in demand for different types of foods.

FIGURE 1

GROWING DEMAND *for* NON-STAPLE FOODS

Demand for staple crops rises slightly faster than global population, increasing about 50% globally by 2050. As more people move out of extreme poverty and gain access to more diverse diets, however, **demand for meat, dairy, and eggs is expected to grow more than 60% and demand for fruits and vegetables will grow even more.**

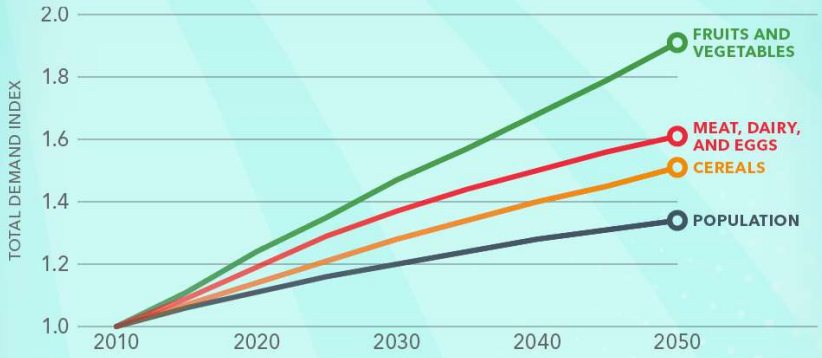
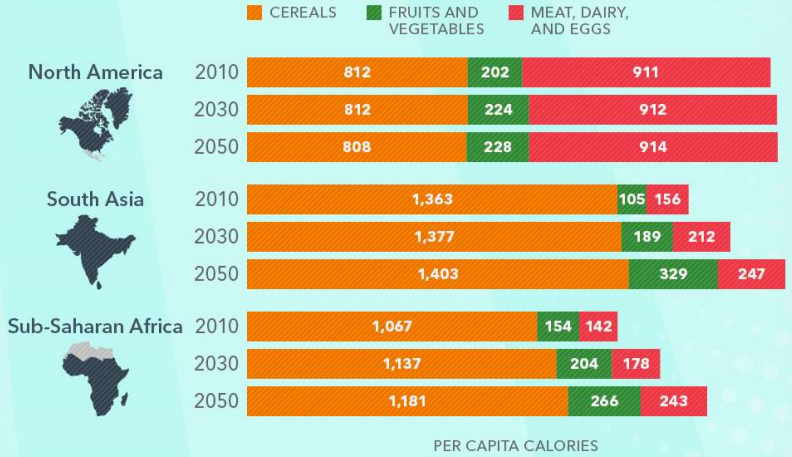


FIGURE 2

DEVELOPMENT SPURS CHANGING DIETS

The main driver in global shifts in food demand is economic development and the changing dietary preferences that come with it. While diets in high-income regions like North America will hardly change at all, **per capita demand for fruit and vegetables in South Asia is expected to more than triple by 2050 and demand for meat, dairy, and eggs in Africa south of the Sahara is expected to grow more than 70%.** Demand for cereals in all regions, however, is unlikely to change much.

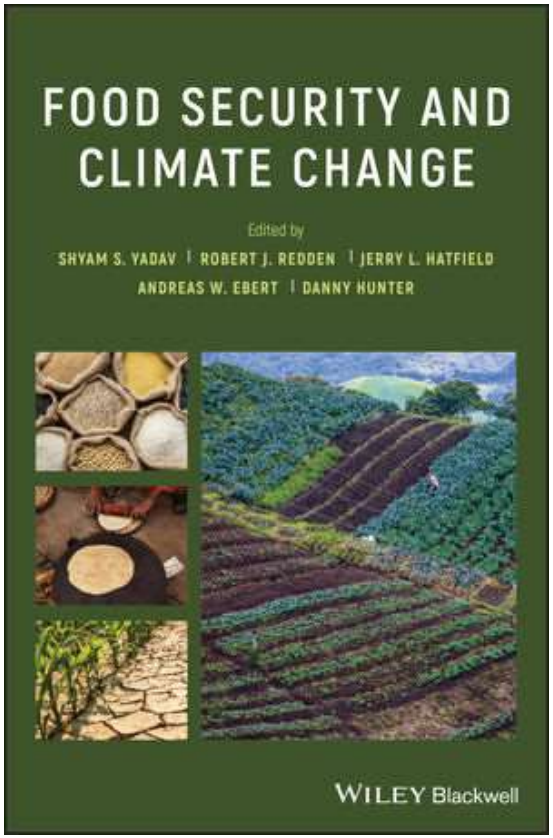


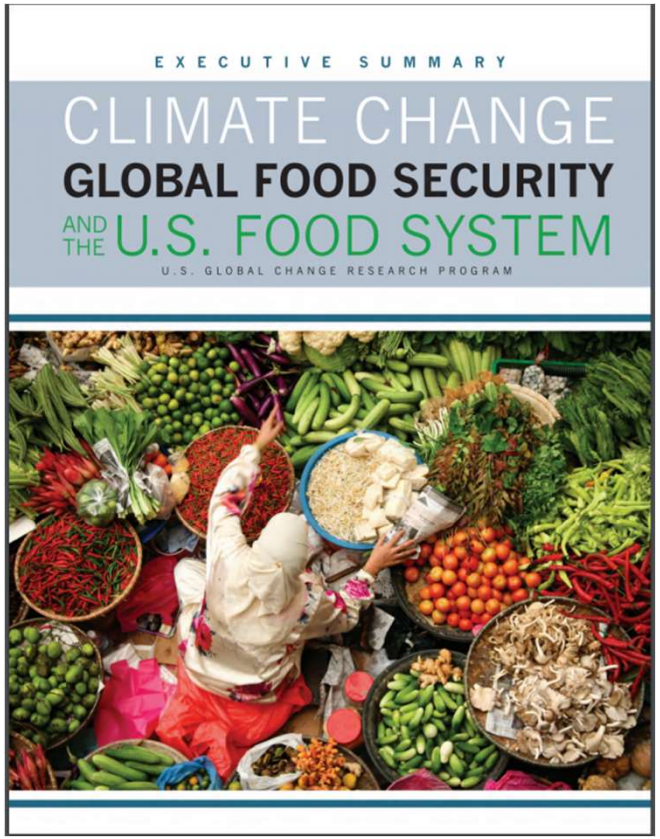
INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI

NOTES: Other food groups have been omitted. Numbers do not reflect climate change impacts, which would lower these projections. For more info please visit https://gfpr.ifpri.info/.

SOURCE: IFPRI (International Food Policy Research Institute). "International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT)." *2017 Global Food Policy Report* (2017): 110-118.

Climate Change

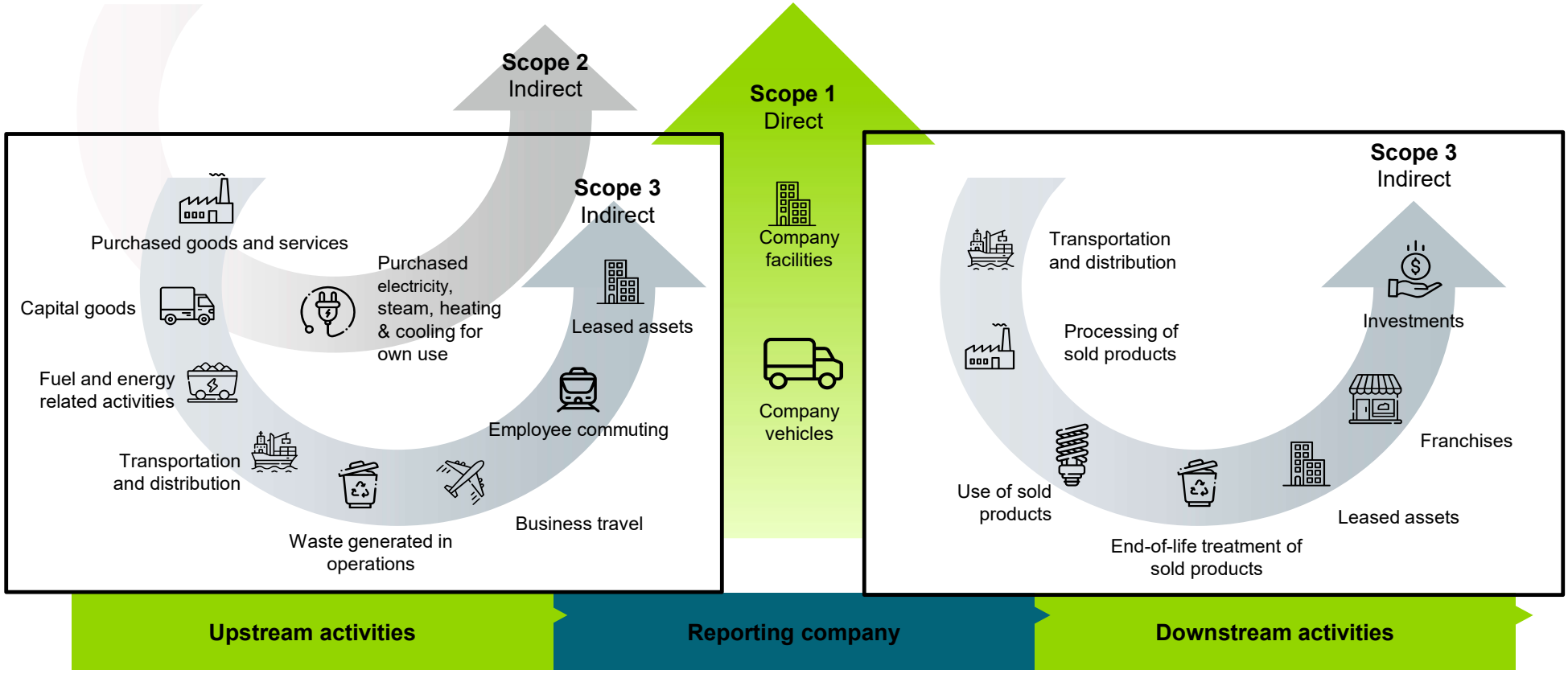




- As global temperatures & sea levels rise, so do severe weather events – in terms of both frequency & severity:
  - Heat Waves
  - Droughts
  - Floods
  - Cyclones
  - Wildfires
- All resulting in risks to agriculture
- IPCC report predicted a 2-6% decline in global crop yields every decade going forward
- Potentially millions of acres phasing out of productive use annually

Let’s Talk Climate

Greenhouse Gas Accounting



What you need for Scope 1 & 2 Baseline

- **Scope 1**: Document all GHG emissions sources at a site or facility level
  - Fuel used on site: type & quantify of natural gas or other fuels burned on site
  - Fleet: # and type of company owned vehicles & average annual miles drive
  - Refrigerants: type and quantity used
  - Direct process emissions from equipment, including VOCs
- **Scope 2**: Document all purchased energy at a site or facility level
  - Determine location or market-based emission factors for each type & quantity used

You need to determine and apply EMISSIONS FACTORS (EFs) to each of these sources to calculate your GHG baseline

What you need for Scope 3 Baseline

Estimate the priority for each category:

- ++ Critical – largest source of emissions (usually PG&S)
- + Important >5 of emissions
- - Marginal <5% of emissions
- X Not relevant to your company

Determine level of data quality available:

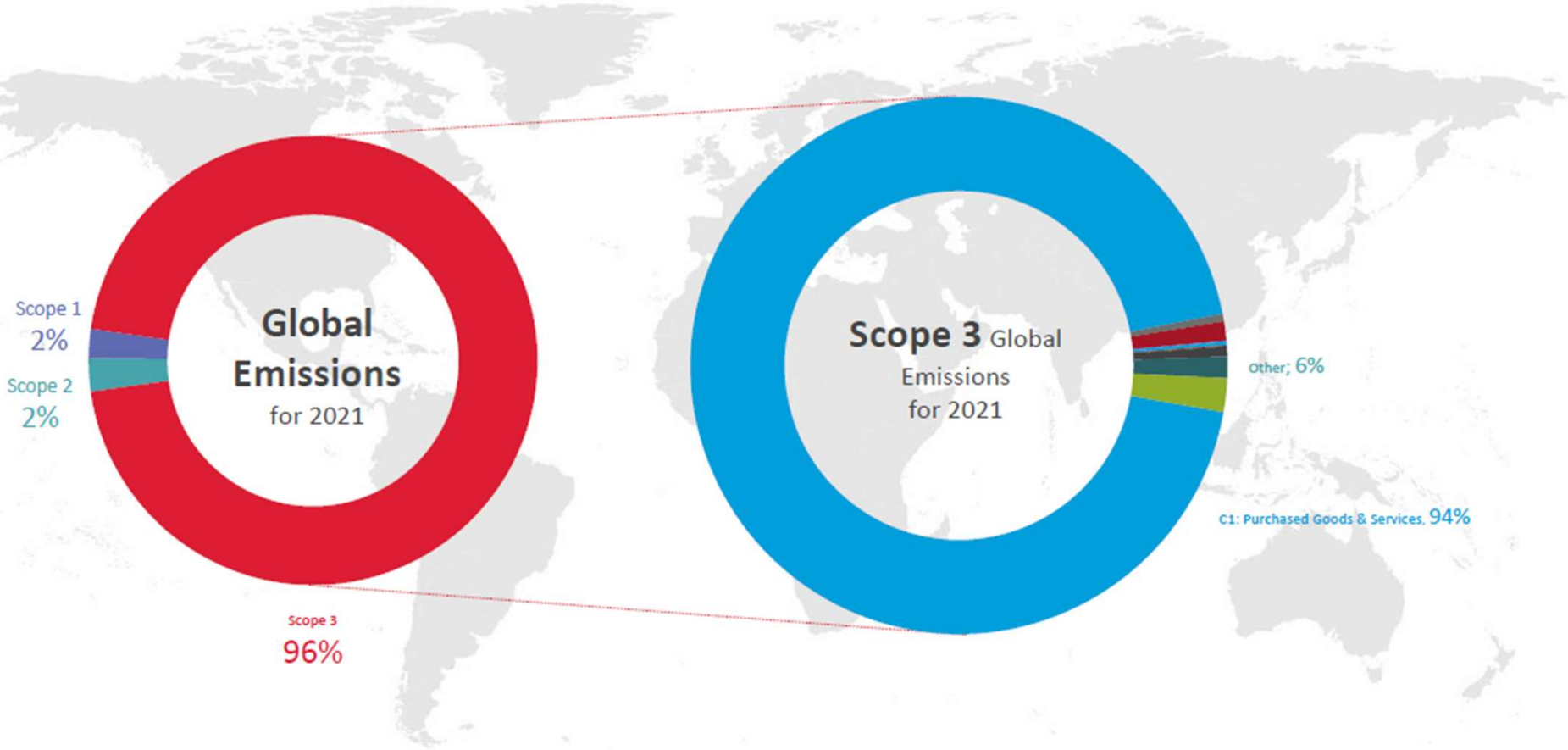
- BEST: Supplier-specific => primary data (best, but rare!)
- BETTER: Hybrid = some supplier data + average method to fill in gaps (emerging)
- GOOD: Average method = weight / distance or other measure-based data x industry average emission factors (most common)
- MINIMUM: Spend-based method = $ spent x industry average emission factors (low confidence in these metrics)

1 purchased goods and services
2 capital goods
3 fuel- and energy-related activities
4 upstream transportation & distribution
5 waste generated in operations
6 business travel
7 employee commuting
8 upstream leased assets
9 downstream transportation & distribution
10 processing of sold products
11 use of sold products
12 end-of-life treatment of sold products
13 downstream leased assets
14 franchises
15 investments

Resources - Biggest Challenge = EMISSIONS FACTORS

- US Environmental Protection Agency
- Greenhouse Gas Protocol
- Science Based Targets Initiative (SBTi)
- Consultants
- Academia
- Peers
- Trade Associations / Roundtables
- NGOs

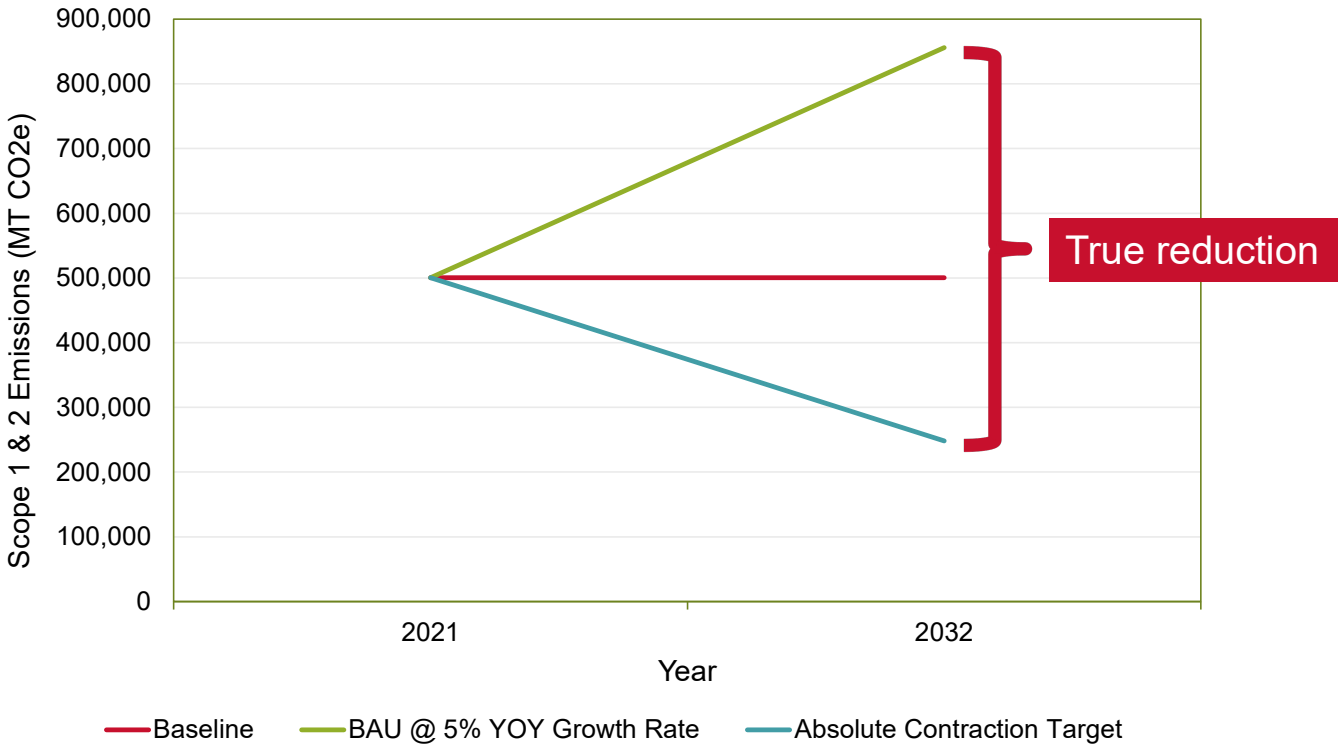
OSI Global Emissions – 2021 Base Year




Scopes 1 & 2
OSI Group commits to reduce absolute scope 1 and 2 GHG emissions
Reduce by
50.4%
by 2032 from a 2021 base year
SCIENCE BASED TARGETS
SBTi Commitment
Scope 3
Reduce emissions for Category 1- Purchased Goods & Services
Reduce by
30.0%
by 2032 from a 2021 base year

Scope 1 & 2 Target for OSI Global – 50.4% Reduction

- Based on limiting climate change to 1.5 deg C
- Must be ABSOLUTE – cannot be intensity based



Levers to Achieve Scope 1 & 2 Targets

Scope 1: Reduce Direct Emissions:

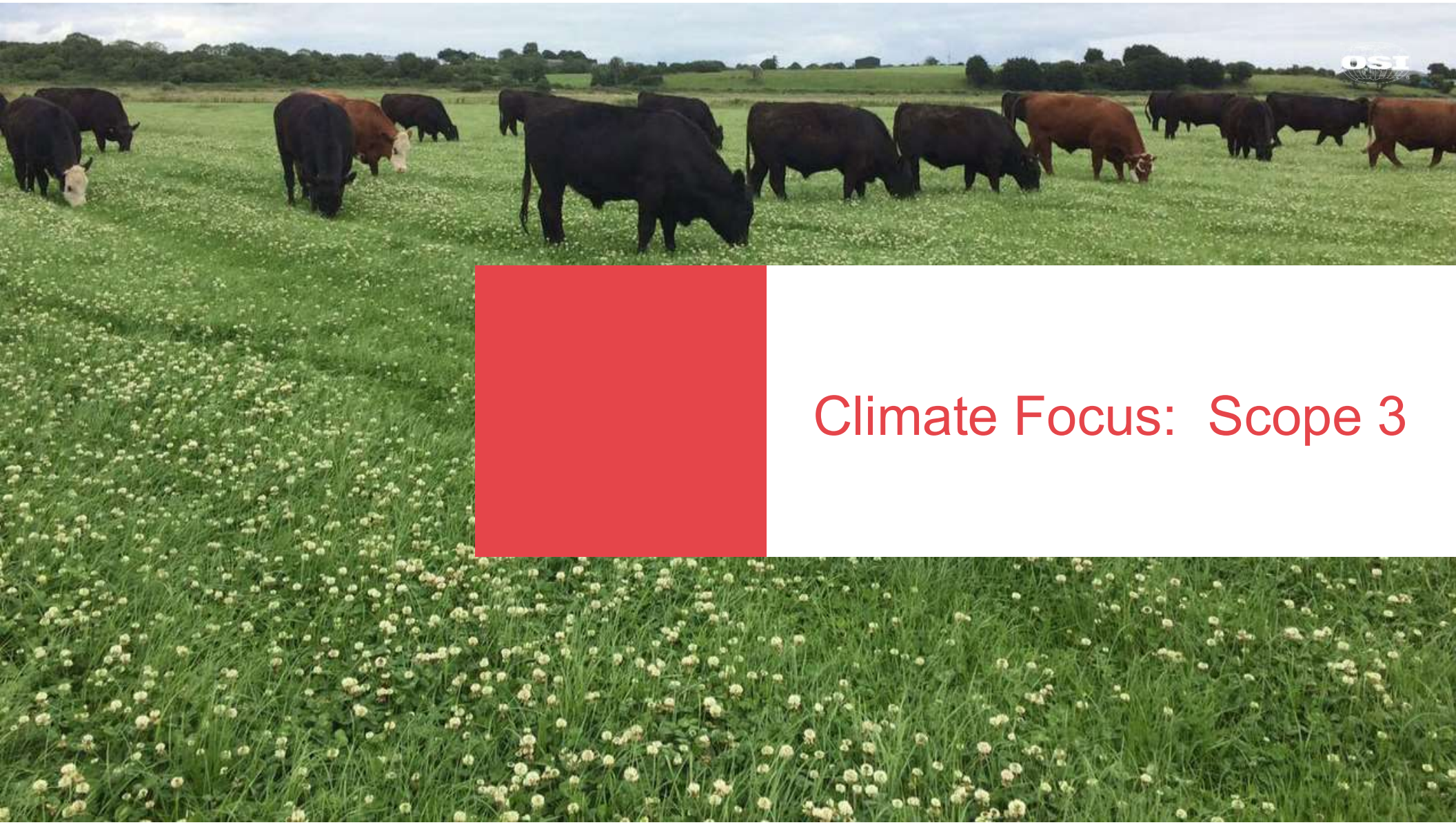
- “Electrification” of operations to reduce burning fossil fuels (e.g. EVs, HVAC systems, etc)
- Reduce / eliminate leaks
- Reduce / change refrigerant use

Scope 2: Energy Conservation:

- Energy efficient equipment (replacements when planned, minimum standards for new)
- Implement metering / monitoring of unit ops to all for management and mitigation of deviations
- Technology upgrades – on demand motors, automated shut-offs, motion sensors, etc
- Behavioral / cultural – employee awareness & training on energy conservation practices

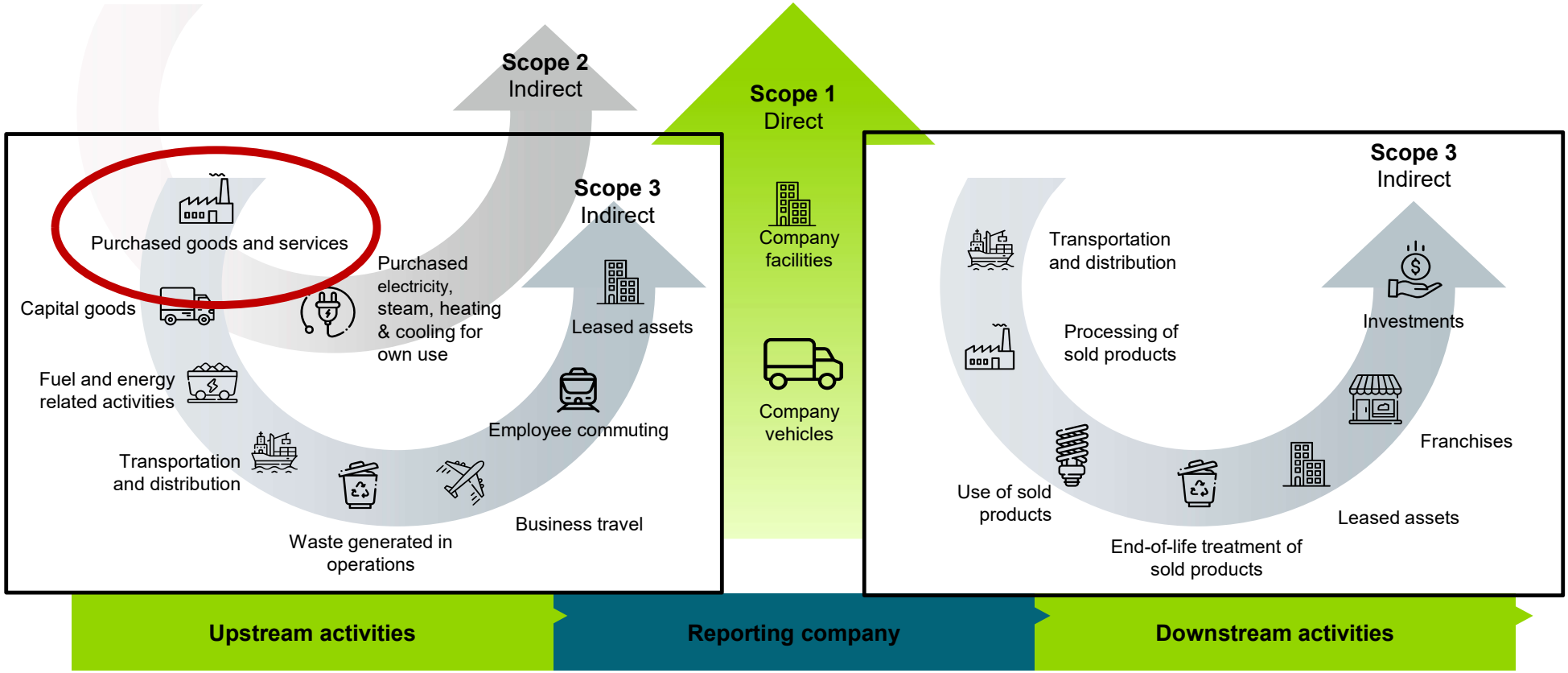
Scope 1 & 2: Renewable Energy Investment:

- Direct – such as on site – solar, wind, anaerobic digester, etc.
- Indirect – Power Purchase Agreements (can be virtual or offtake)



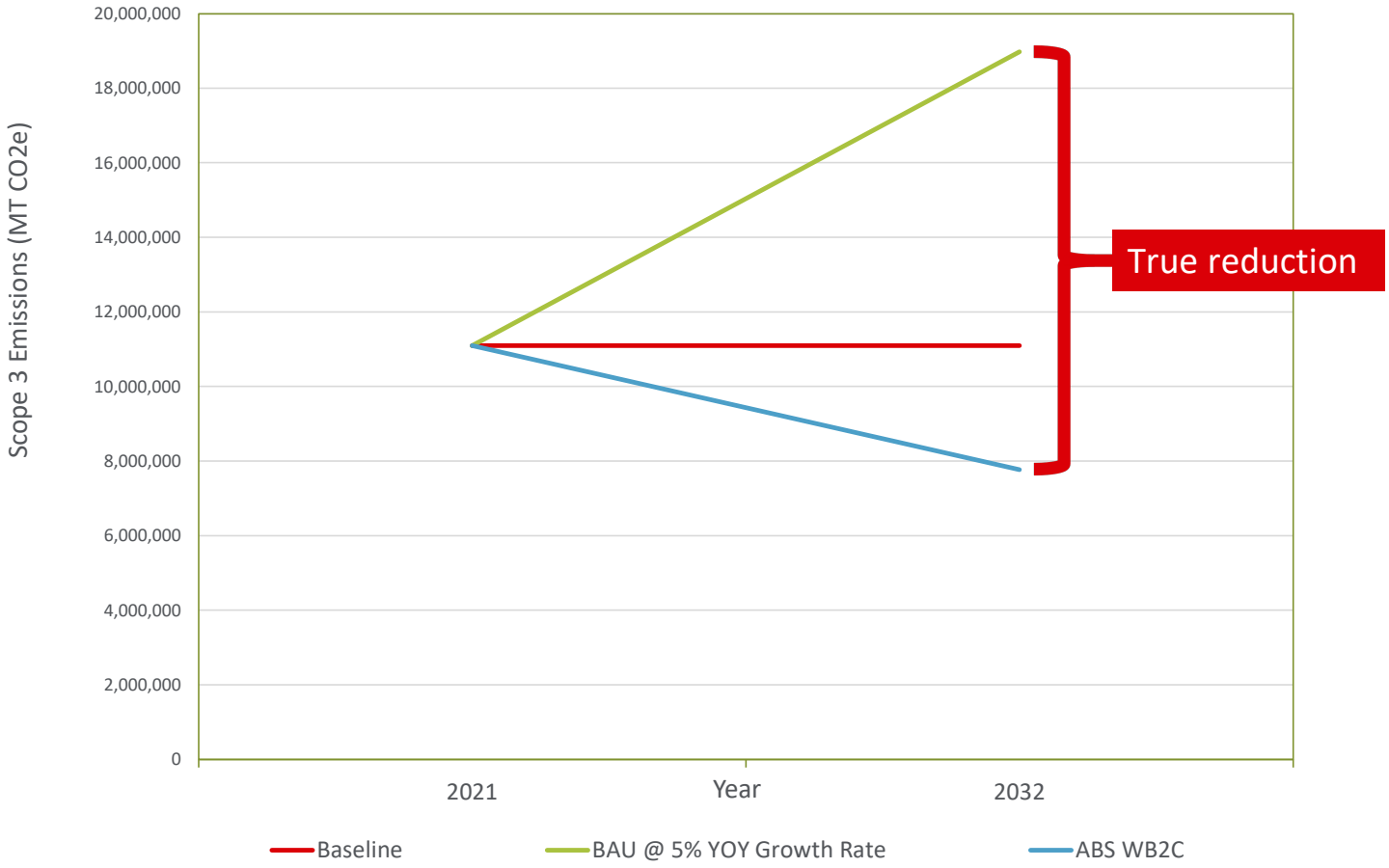
Climate Focus: Scope 3

Focus Scope 3 Efforts Where it Matters Most



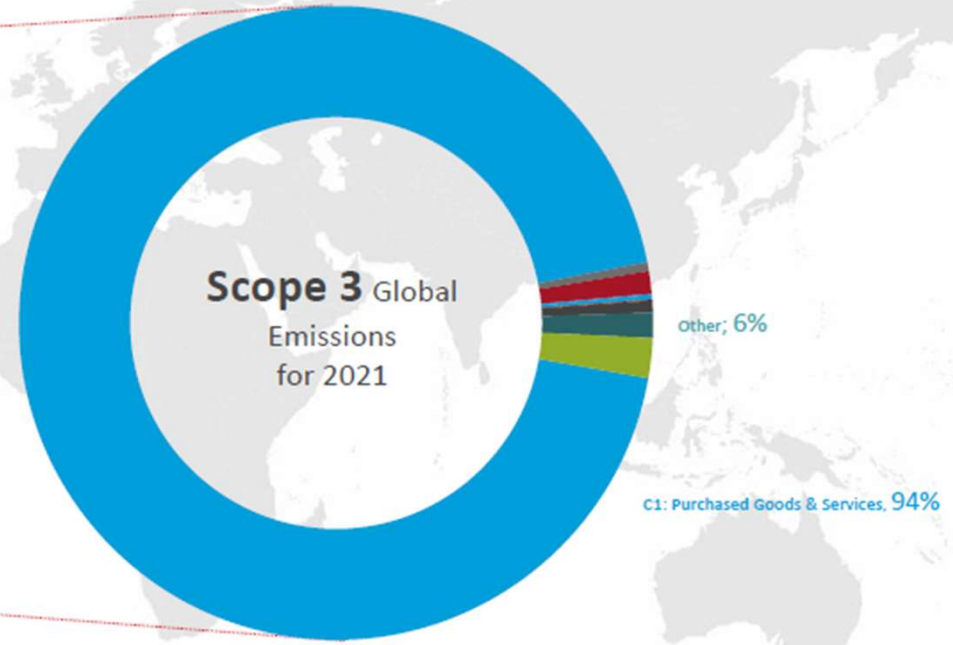
Scope 3 Target for OSI Global – 30.0% Reduction

- Based on limiting climate change to "well below 2 deg C"
- Can be absolute or intensity based – we chose absolute
- Does not include sector-specific FLAG target at this time



PG&S = 94% of our Scope 3 Emissions

The “other” 6% - Excluded from Target	
Category 2	Capital Goods
Category 3	Fuel and Energy Related Activities
Category 4	Upstream Transportation & Distribution
Category 5	Waste Generated In Operations
Category 6	Business Travel
Category 7	Employee Commuting
Category 9	Downstream Trans & Distribution
Category 12	End-of-Life Treatment of Sold Products
Category 15	Investments



Focus on PG&S => Focus on Supply Chain

Improve Baseline Data

- Develop accurate, current data sets representative of actual practices
- Establish bespoke emissions factors
- Better understanding of farm systems in our network

Supply Chain Projects*

- Fewer “transactional” and more strategic supplier relationships
- Projects to accelerate adoption of known interventions that improve on farm performance AND reduce emissions
- Better data!

Sustainable Sourcing Policy

- Suppliers expected to set science-based climate targets
- Reward those that provide primary emissions data
- Reward those that partner to drive adoption of reduction practices

* Direct supply chain projects result in lower emissions factors, indirect or supply “shed” projects result in “inset credits” that keep the value of the project in the food system – vs. offset credits that are used by other industries to “offset” their emissions.

Beef Opportunity Areas: Strategies to Reduce Emissions & Sequester Carbon

Climate & Deforestation

Soil Health & Nutrient Management

Regen ag practices, like: cover crops, low/no till, grazing management plans, fertilizer, and other soil management levers

Grassland

Pasture-land management, multi-species swards, grazing management plans

Genetics

Reduced age at slaughter, improved feed efficiency, methane production, & reproductive efficiency

Feed

Improve grazing forage, methane reducing feed additives, reduce protein surplus in diets

Chicken & Pork Opportunity Areas: Focused on Feed & Farm Management

Climate & Deforestation

Preservation of High Conservation Value Land

Supply chain traceability for feed inputs to assess and mitigate risk of land conversion and deforestation.

Live Ops Efficiency

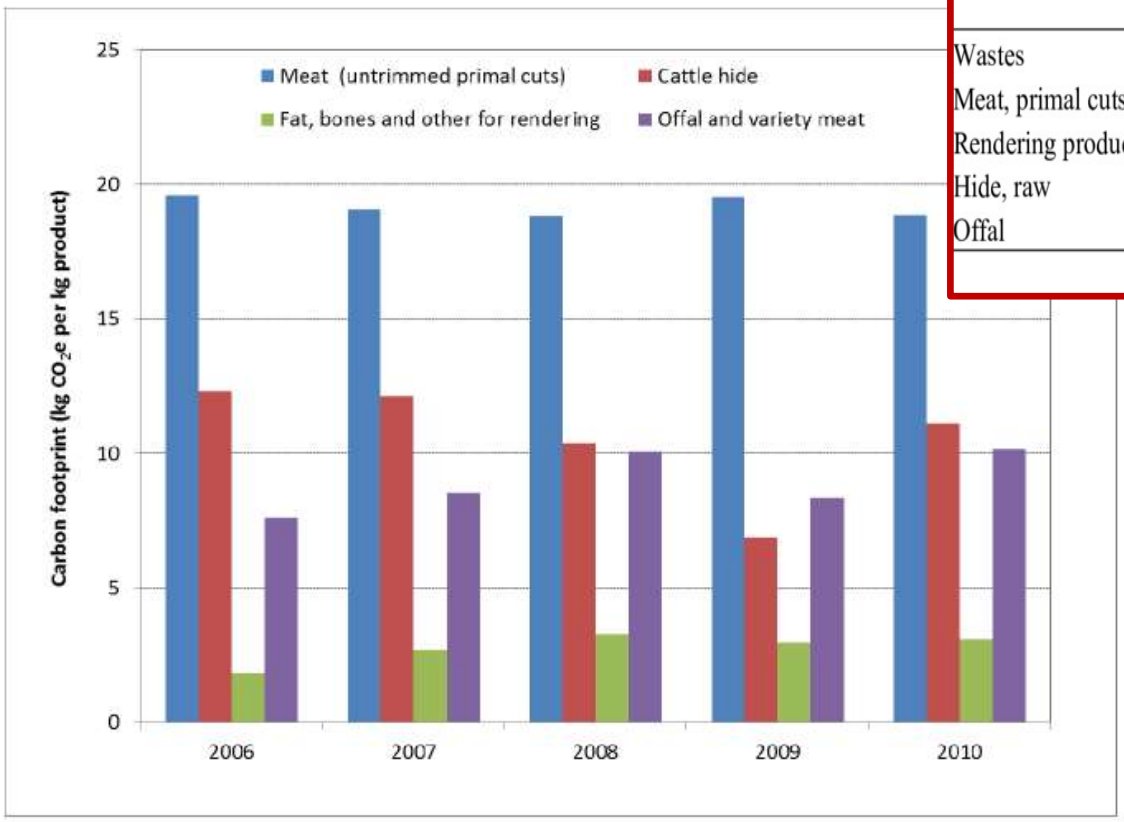
Testing automation techniques for improved inputs management, better animal welfare outcomes and better data capture

Animal Welfare

Engagement with suppliers to build relationships with farmers and trusted advisors to develop custom projects.

Allocation of Emissions Matters

Figure 2. Estimated carbon footprint of beef products in Canada using an economic allocation, 2006–2010.



	Mass balance	Co-products allocation factors	
	% SLW	Mass	Economic
Wastes	21.3%	-	-
Meat, primal cuts	37.8%	48.0%	83.6%
Rendering product	32.8%	41.7%	6.8%
Hide, raw	4.9%	6.2%	6.8%
Offal	3.2%	4.1%	2.7%
	100%	100%	100%

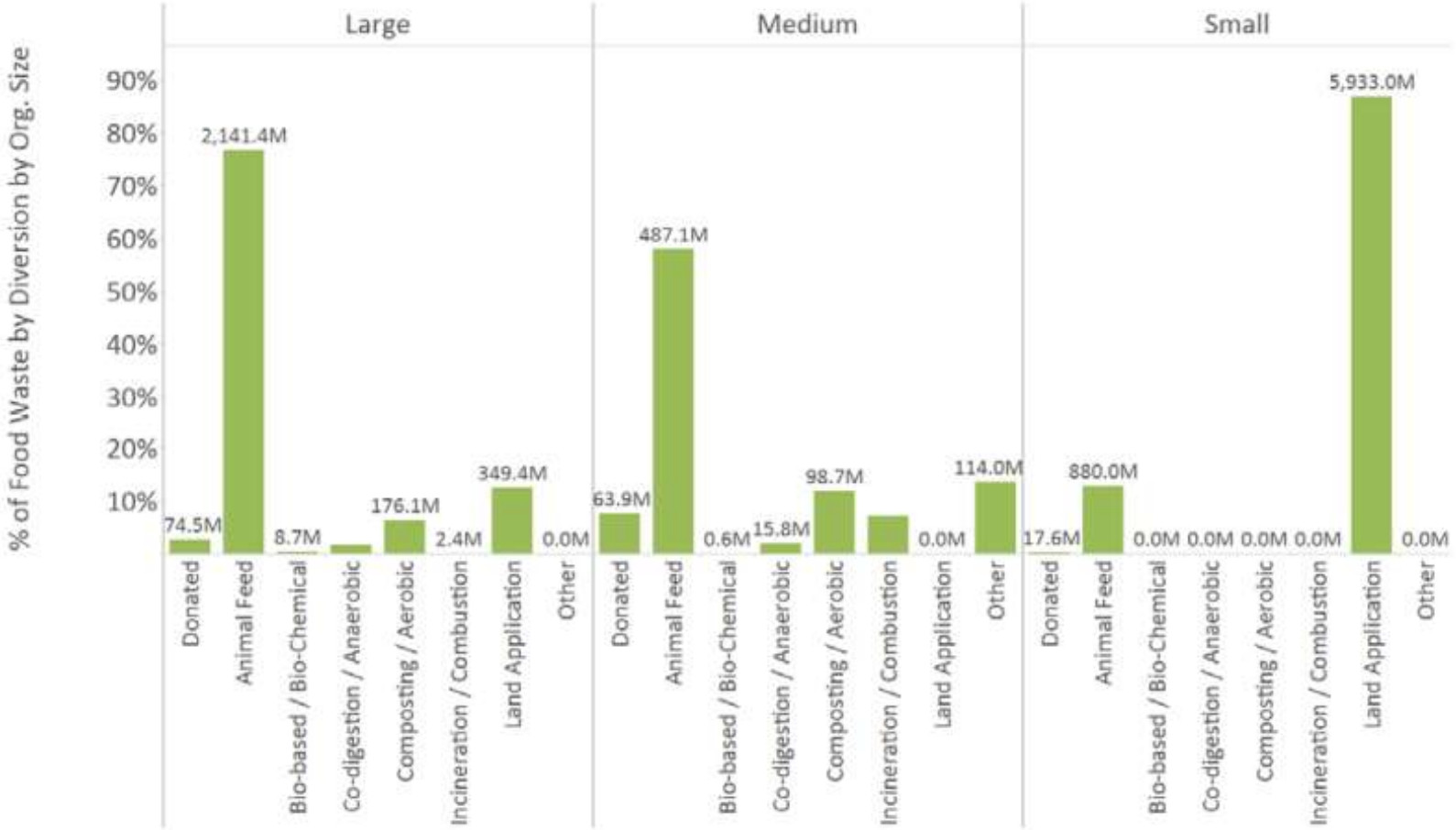
Desjardins, Raymond & Worth, Devon & Vergé, X. & Maxime, Dominique & Dyer, Jim & Cerkowniak, Darrel. (2012). Carbon Footprint of Beef Cattle. Sustainability. 4. 3279-3301. 10.3390/su4123279.

The Role of By-Products

The "other" 6%	
Category 2	Capital Goods
Category 3	Fuel and Energy Related Activities
Category 4	Upstream Transportation & Distribution
Category 5	**Waste Generated In Operations***
Category 6	Business Travel
Category 7	Employee Commuting
Category 9	Downstream Trans & Distribution
Category 12	End-of-Life Treatment of Sold Products
Category 15	Investments

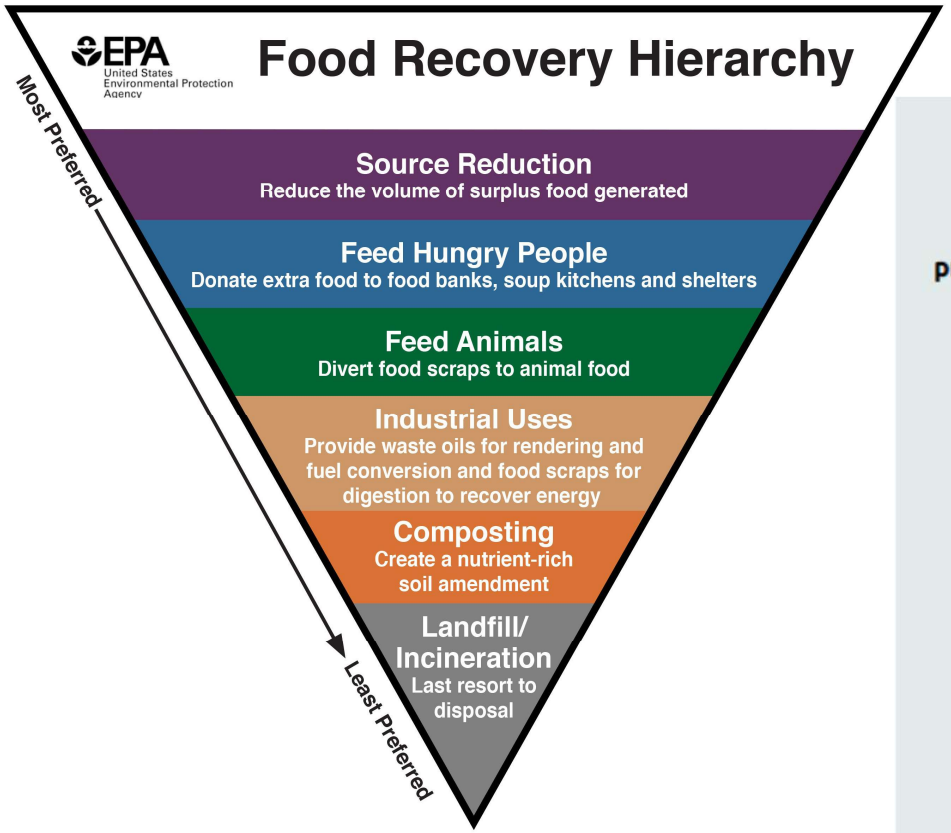
* In human food production systems this number is generally VERY low thanks to long standing practices of diverting by-products to farm and companion animal feed!

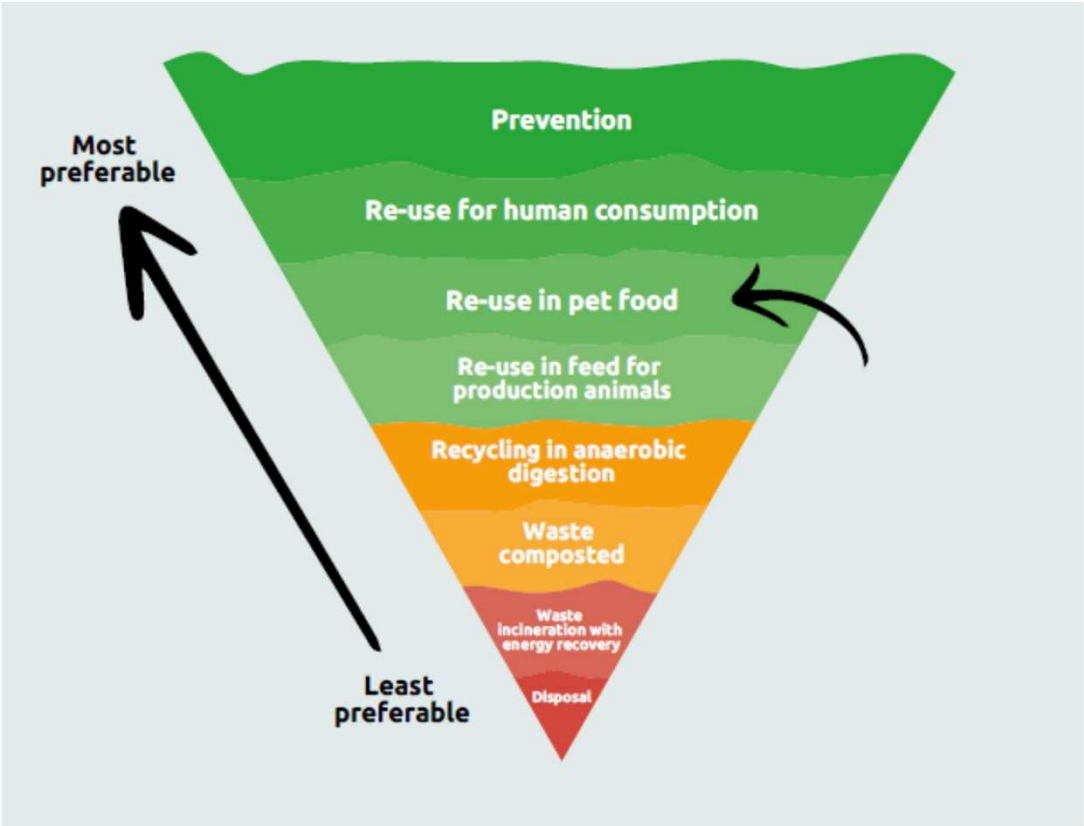
FIGURE 5. DIVERTED FOOD WASTE (IN POUNDS) BY COMPANY SIZE, MANUFACTURING RESPONDENTS, 2016



Source: Food Waste Reduction Alliance 2016 Publication

Priority Uses for By-Products of Human Food Production

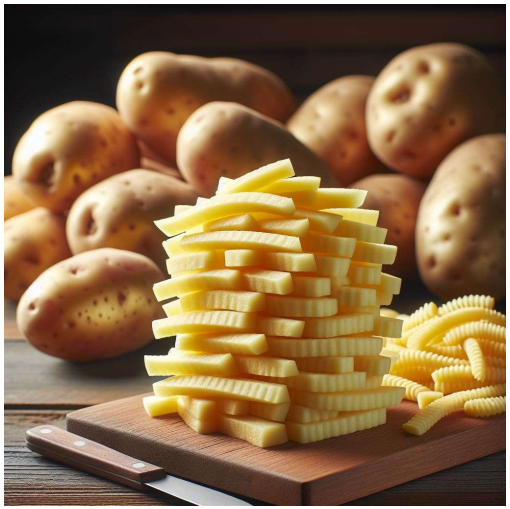




“Moving up the Hierarchy” with By-Products: OSI-> IQI

Potato trimmings from our Vista Plant in India

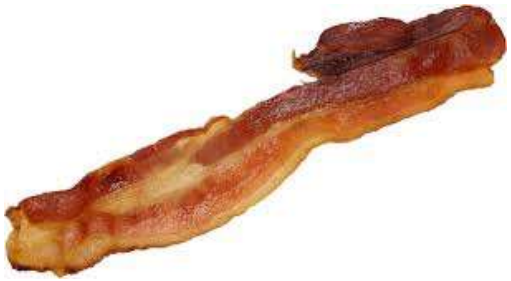
Contains carbohydrates for energy, protein and vitamins B, C & potassium



Tomato Pomace (skins & seeds) from our Vista Plant in India

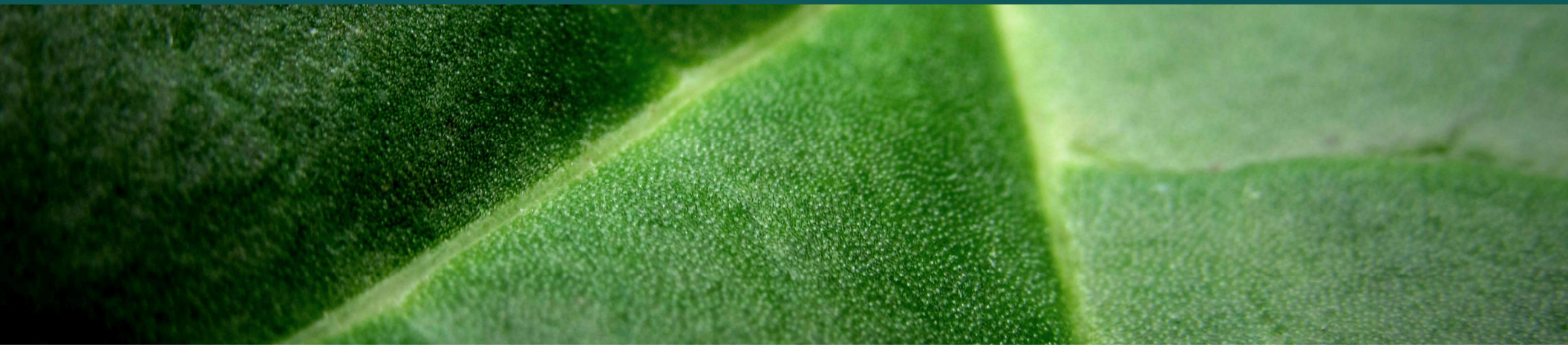
High in fiber and contains lycopene, beneficial amino acids and vitamins C, K1 & potassium

Bacon Fat from multiple plants in the US and the Netherlands for improved palatability and a great label claim



LCA Results

Lamb meal



Results: Lamb (at farm)

Results insight and analysis: farm & feed

RIVM secondary dataset used for the production of New Zealand lamb.

Lamb, at farm carbon footprint: 9.72 kgCO2eq./kg lamb

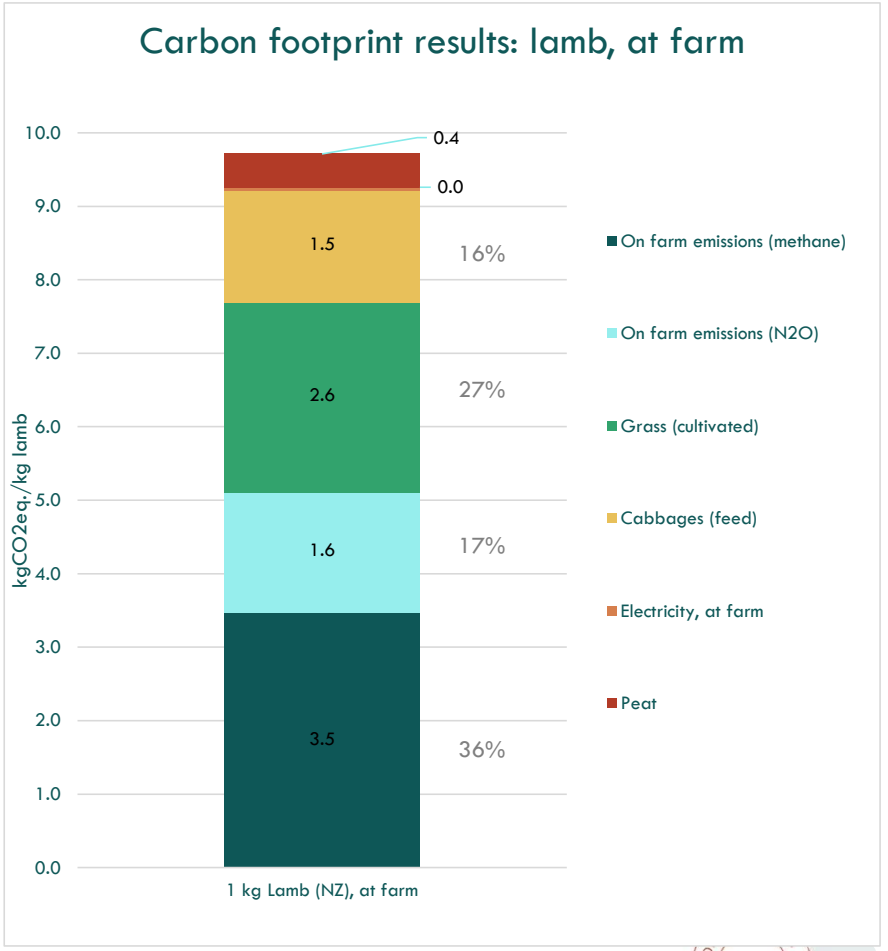
**Note, the original reference data is from 2010, and the model was updated with biophysical allocation using PEF default data.*

- 36% of the impact from methane emissions (enteric fermentation);
- 17% of the impact from N2O emission (manure);
- 27% of the impact from grass;
- 16% of the impact from cabbages (feed).

<u>Insight into the results:</u>

***On farm emissions**: red meat has a high footprint due to the associated emission of GHGs such as methane and dinitrogen oxide. The GWP of each gas is 29.8 and 273 respectively (CO2 is 1).*

***Grass:** highly fertilized (resulting in more GHGs such as N20), the true NZ system may use a more extensive system.*



Results: Lamb meal

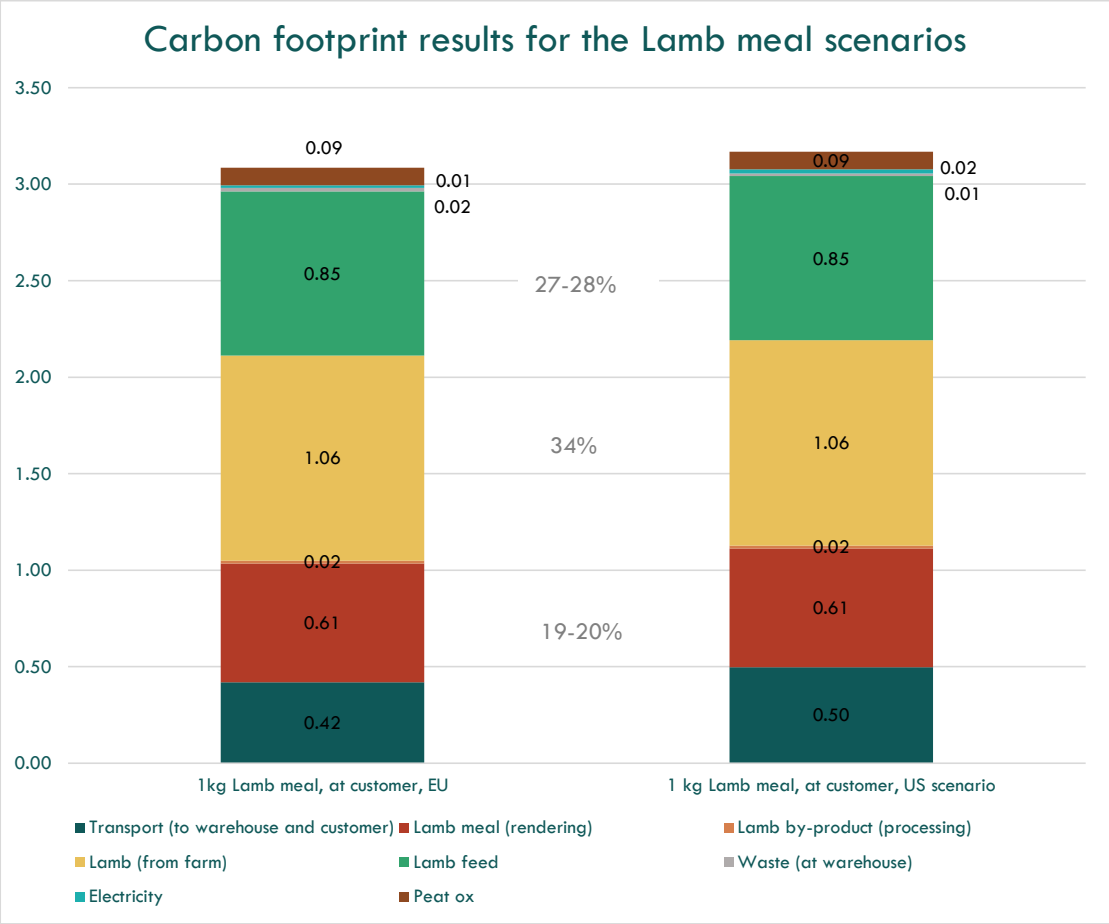
The footprint of lamb meal was 3.09 kgCO2eq./kg meal and 3.17 kgCO2eq./kg meal for the EU and US customer markets respectively.

Hotspots:

- Lamb production at farm contributes 34%;
- Lamb feed contributed 27-28%;
- Lamb meal rendering contributed 19-20%

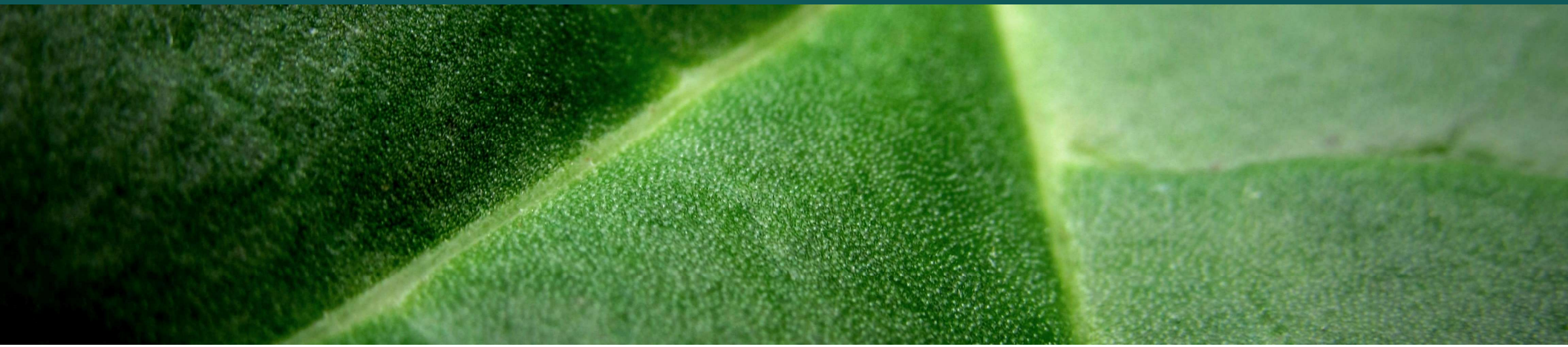
- Transport contributes 14% and 16% in the EU and US scenarios respectively;

- Land use change (LUC) is *not* a hotspot in either lamb scenario. It contributed only 0.02% to the total footprint.



LCA Results

Salmon meal



Results: Salmon, at farm

Results insight and analysis: farm & feed

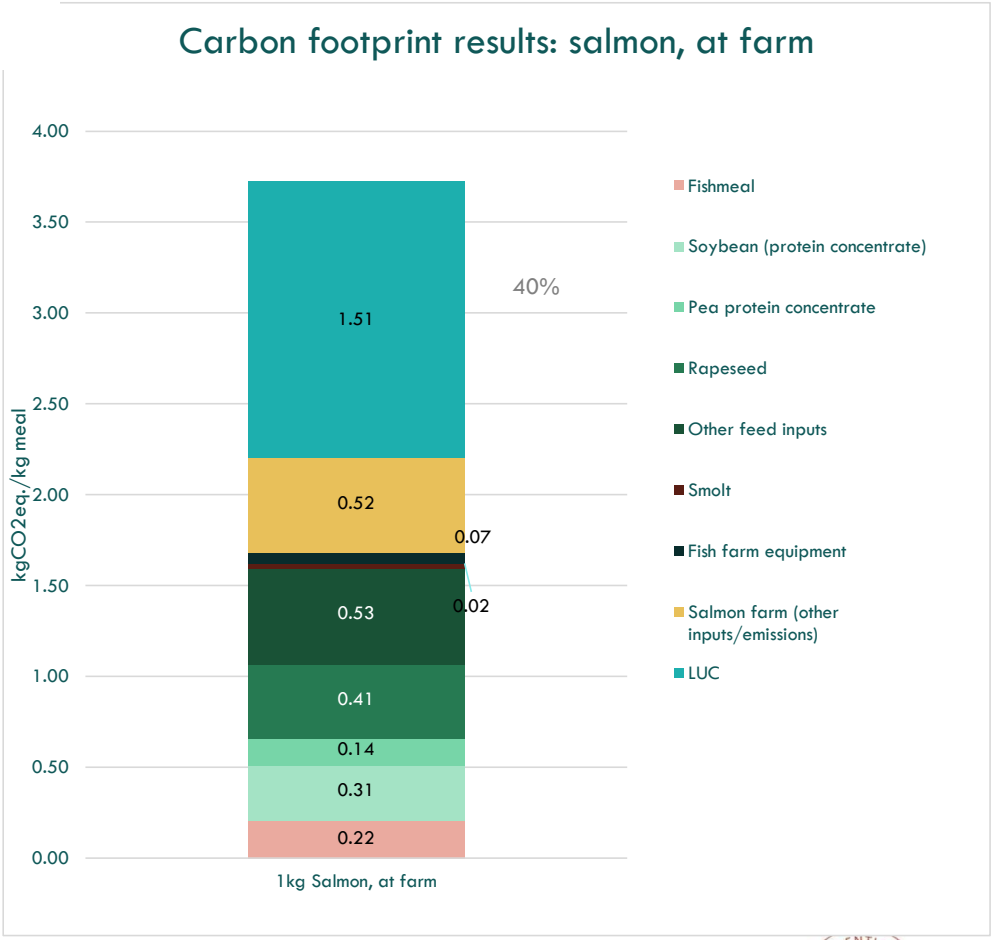
Blonk's Chilean salmon reference system was used:

- The footprint of farmed salmon was 3.7kgCOeq./kg
- 40% of the impact came from land use change.

<u>Insight into the results:</u>

Farming: influential data points for salmon farming include the FCR and the compound feed fed (e.g. ingredients and their origin). The footprint of salmon in the literature is variable e.g. 2.9-6.1 kgCO2e.q.

Land use change: 98% of this impact was contributed by feed ingredients, with 50% from soybeans sourced from Argentina alone.



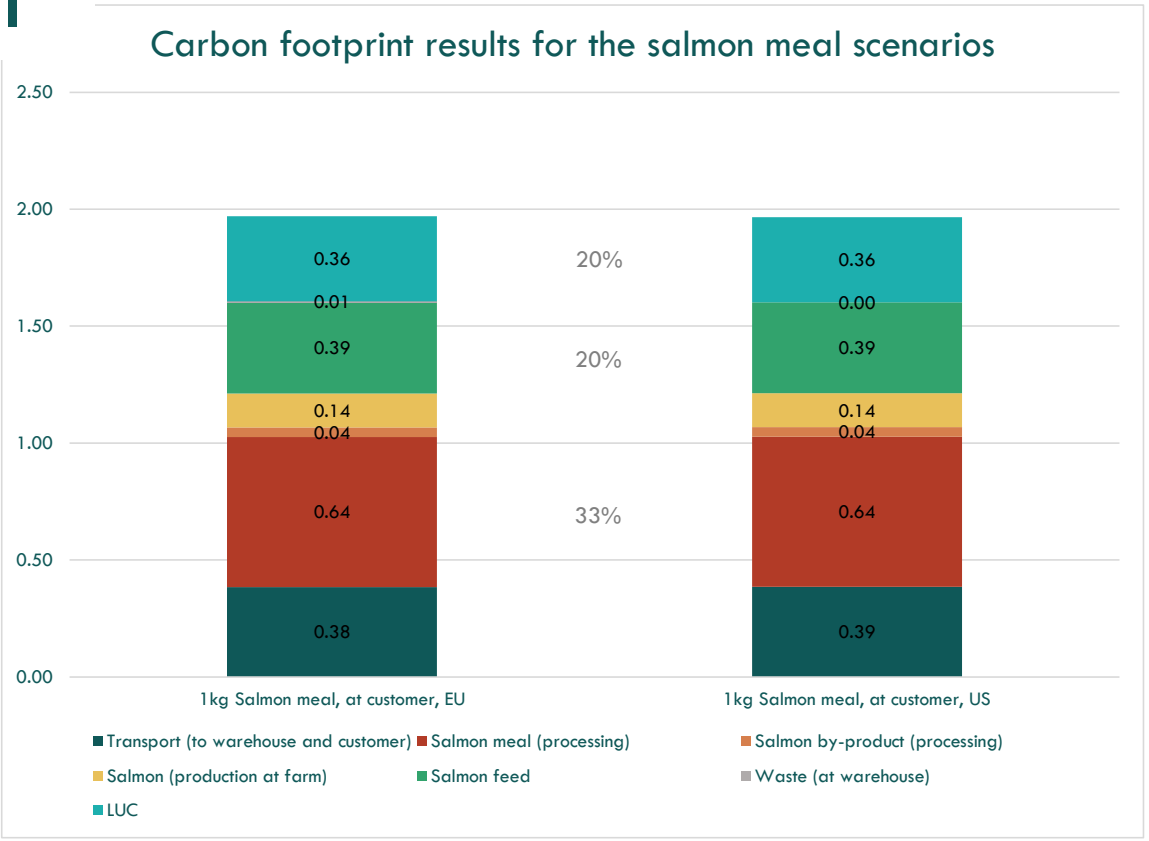
Results: Salmon meal

The footprint of salmon meal in both scenarios is 1.97 kgCO2eq./kg meal

Hotspots:

- Salmon meal (rendering): 33%;
- Salmon feed: 20%;
- Land use change (LUC): 18%.

- Transport contributes 19% and 20% in the EU and US scenarios respectively;



QUESTIONS?
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THANK YOU