

Attending

Fernando Miranda, Austral Group
Ivan Geller, Austral Group
Didier Saplan, Austral Group
Stuart Monteith, MBP Solutions
Simran Shergill, Nature's Way
Charles Perez, KD Pharma
Andrew Clark, KD Pharma
Auður Emilsdóttir, Lysi

Ana Morão, Corbion
Muhamad Diandra, Corbion
Lauren Tarde, EcoEngineers
Michael Royko, BASF
Nicole Kunin, MSC
Brett Glencross, IFFO
GOED: Chris Gearheart, Ellen Schutt

Recording

 [\[Watch the recording\]](#)

Passcode: E%N0?5+!

Meeting agenda

- **Committee housekeeping**
 - Introductions
 - Muhamad Diandra, Corbion
 - New Sustainability Communications Manager, emphasizing the importance of cross-industry collaboration in standardizing LCA methodologies.
 - Ana Morão, Corbion
 - Shared her extensive LCA experience, particularly in algae-based products.
 - Andrew Clark, KD Pharma
 - Joined to deepen understanding of LCA work relevant to the company's operations.

- Member sustainability kudos
 - MSC opened a second office in Shenzhen, China, linked to local ambitions to develop a robust tuna industry.
 - Chris invited members to share additional accomplishments, but no others were raised.
- **Presentations**
 - LRQA/EcoEngineers, the environmental engineers GOED hired to write new ISO-inspired guidance on conducting and writing a quality life cycle assessment (LCA), shared the basics about LCAs and explained the outcomes and procedures for this project.
 - **Overview of EcoEngineers**
 - Specialized firm supporting energy transition and carbon management with experience across fuel, agriculture, and industrial sectors.
 - **Intro to LCAs**
 - Defined LCAs as comprehensive assessments of environmental impact across a product's lifecycle, ideally following ISO 14040/14044.
 - Key phases: Goal & Scope Definition, Inventory Analysis, Impact Assessment, Interpretation.
 - Discussed boundary setting (e.g., cradle-to-gate vs cradle-to-grave) and how it affects comparability.
 - **Relevance to Omega-3 Sector**
 - Aims to provide consistent, credible LCA guidance for GOED members.
 - Project is in the research and interview stage; interview requests are underway.
 - Final output: A high-level framework with design principles, guidance, and decision support tools.
 - **Team & Process**

- Technical team led by Ghasideh Pourhashem.
 - Initial interviews being scheduled for July/August; drafting of framework to begin in November
- Didier Saplana, COO of GOED member Austral Group, who shared top-line findings from the company's recently published LCA.
 - **Company Background**
 - Peru-based fishing company focused on anchovy-derived fishmeal and fish oil; key supplier to the omega-3 industry.
 - **LCA Motivation**
 - Market-driven need to provide carbon footprint data for B2B customers (especially salmon feed manufacturers).
 - Competitiveness is increasingly tied to footprint data; one major feed customer explicitly prioritizing LCA-backed claims.
 - **LCA Execution**
 - Partnered with a local university for execution.
 - Defined boundaries from fishing through shipping to destination port (excluding distribution and human consumption).
 - Used ISO 14067 methodology and calculated footprint under multiple allocation approaches (energy, mass, economic).
 - **Key Findings**
 - Crude fish oil had a footprint of ~4,430 kg CO₂-eq/ton.
 - Fishing and processing were major contributors (especially diesel use).
 - Management of the fishery (anchovy abundance and quality) strongly affected sustainability outcomes.
 - High dependency on fossil fuels meant intensity-based reduction targets were more realistic than absolute cuts in the short term.
 - **Strategic Insights**
 - LCAs can shift strategic thinking: sourcing, processing, claims.
 - An LCA is not static, evolving with better data, regulatory needs,

and shifting customer expectations.

- Emphasized that credibility and comparability require transparency in assumptions, boundary setting, and allocation.

- **Barriers to LCA Adoption**

- Lack of regulatory mandates, few market incentives outside salmon feed sector, and perceived complexity.

- **Discussion / Q&A**

- Charles noted the value of transparency and the challenge of comparing LCAs with different scopes and requested a link to Didier's article

- [\[This is Austral's published LCA\].](#)

- General comments

- Chris emphasized that even companies not yet conducting LCAs can still contribute insights via the eco engineers survey.

- [\[Click here if your company has conducted or intends to conduct an LCA\]](#) and you'd like to improve the general sustainability posture of the entire category.]

- **Next Committee Calls**

- August 20, 2025 | [[Click for your local time](#)]
 - Topic: TBD — please contact Chris (chris@goedomega3.com) if you would like to feature an accomplishment by your team.
- September 17, 2025 | [[Click for your local time](#)]
 - Topic: TBD

GOED Sustainability Committee Call

Main Topics: GOED's New LCA
Advisory + Austral Group's
Recent LCA

July 16, 2025



Agenda

Committee housekeeping

- New committee members
 - Ana Morão and Muhamad Diandra, Corbion
 - Giovana Silva, Vermaris
 - Cheng Shang, Seawit
- Member sustainability kudos

Presentations

- LRQA/EcoEngineers, the environmental engineers GOED hired to write new ISO-inspired guidance on conducting and writing a quality life cycle assessment (LCA), will share the basics about LCAs and explain the outcomes and procedures for this project.
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Discussion / Q&A

Next Committee Calls

Member kudos

Marine Stewardship Council

GOED member [Marine Stewardship Council](#) (MSC) has opened a second office in China. The new office is located in Qianhai, Shenzhen, which has been seeking to develop a more robust tuna industry.

[Read on »](#)

JULY 7, 2025

MSC opens second office in China



Mark Godfrey published in Environment & Sustainability



Media event

National Geographic's *Ocean*

- Released in UK theaters
- Narrated by Sir David Attenborough
- Highlights threats and opportunities facing the Earth's oceans and waterways.
- Not an anti-fishing film. Arguments from Attenborough:
 - We should not avoid fish and be against fishing, but rather that fishing needs to be done sustainably.
 - One-third of the ocean should be in order for protections to work.
 - Supplements are mentioned in passing. Minor concern about the impact of krill on ecosystems expressed.
- Had a streaming release on June 8
- Meant to draw attention to the UN Ocean Conference last week.

[View in browser](#) | June 2, 2025

GOED

The GOED Current

GOED Reviews 'Ocean with David Attenborough' Documentary



It was brought to GOED's attention that a new documentary "Ocean" was being released in movie theaters in the UK and on the well-respected National Geographic channel. GOED was able to view the documentary to make sure there was no content that could generate negative media for our industry. The documentary is narrated by Sir David Attenborough, noted British broadcaster and naturalist, who stated, "After almost 100 years on the planet, I now understand the most important place on Earth is not on land, but at sea." The 99-year-old filmmaker appears in and narrates this film that explores the threats and opportunities facing the Earth's oceans and waterways.

Attenborough and his team used stunning cinematography and sound to bring ocean ecosystems to life. While the destruction of some ecosystems due to overfishing and ocean floor trawlers cast a dark pall in the beginning of the

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Presentations

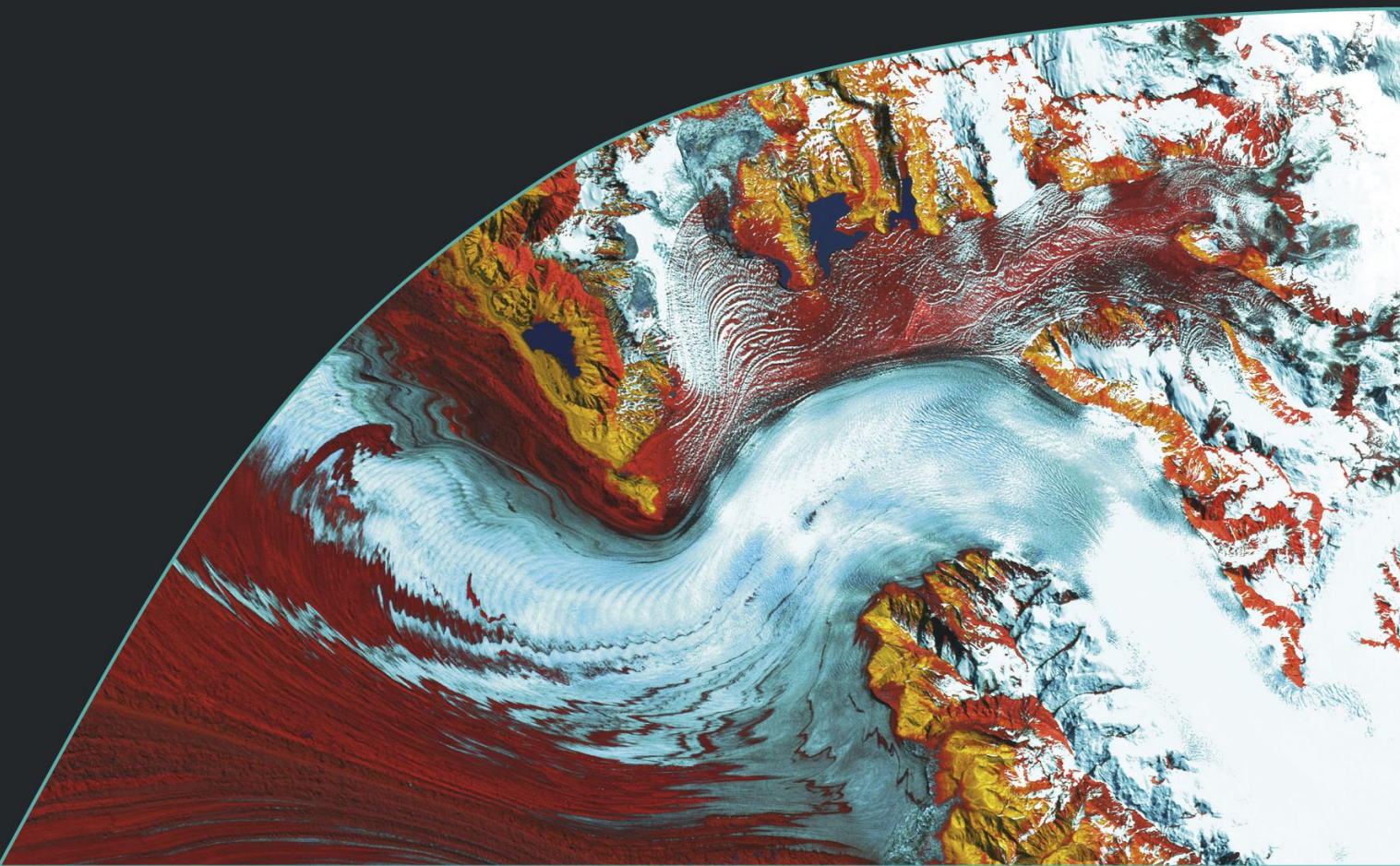
- LRQA/EcoEngineers, the environmental engineers GOED hired to write new ISO-inspired guidance on conducting and writing a quality life cycle assessment (LCA), will share the basics about LCAs and explain the outcomes and procedures for this project.
- Didier Saplana, COO of GOED member Austral Group, who will share top-line findings from the company's recently published LCA.

Discussion / Q&A

Next Committee Calls

Building a Clean Energy Economy

GOED



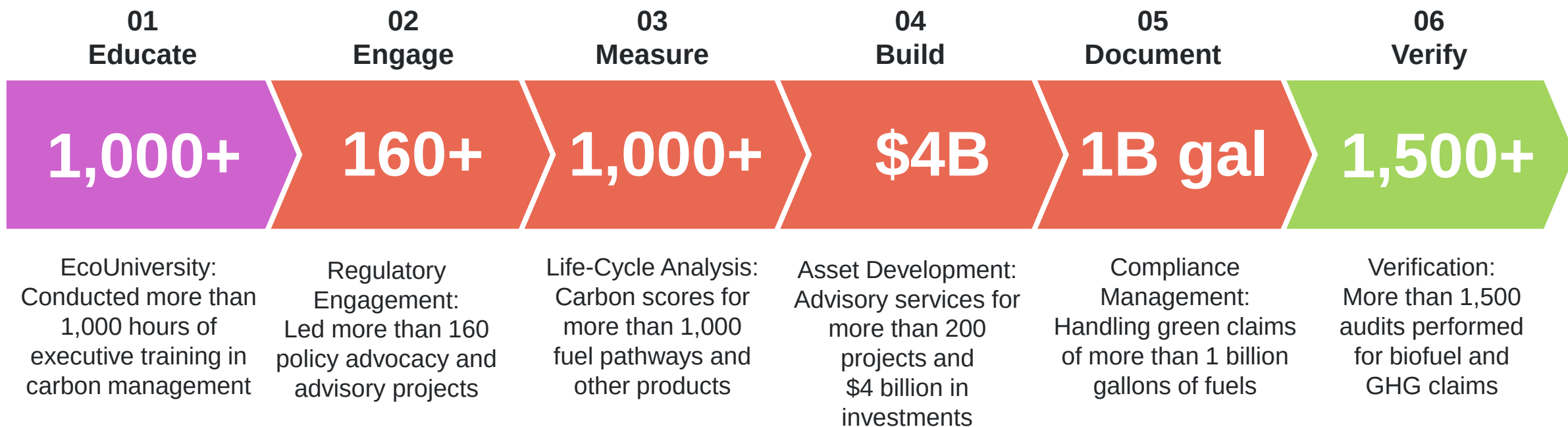
07.16.2025

We Are:

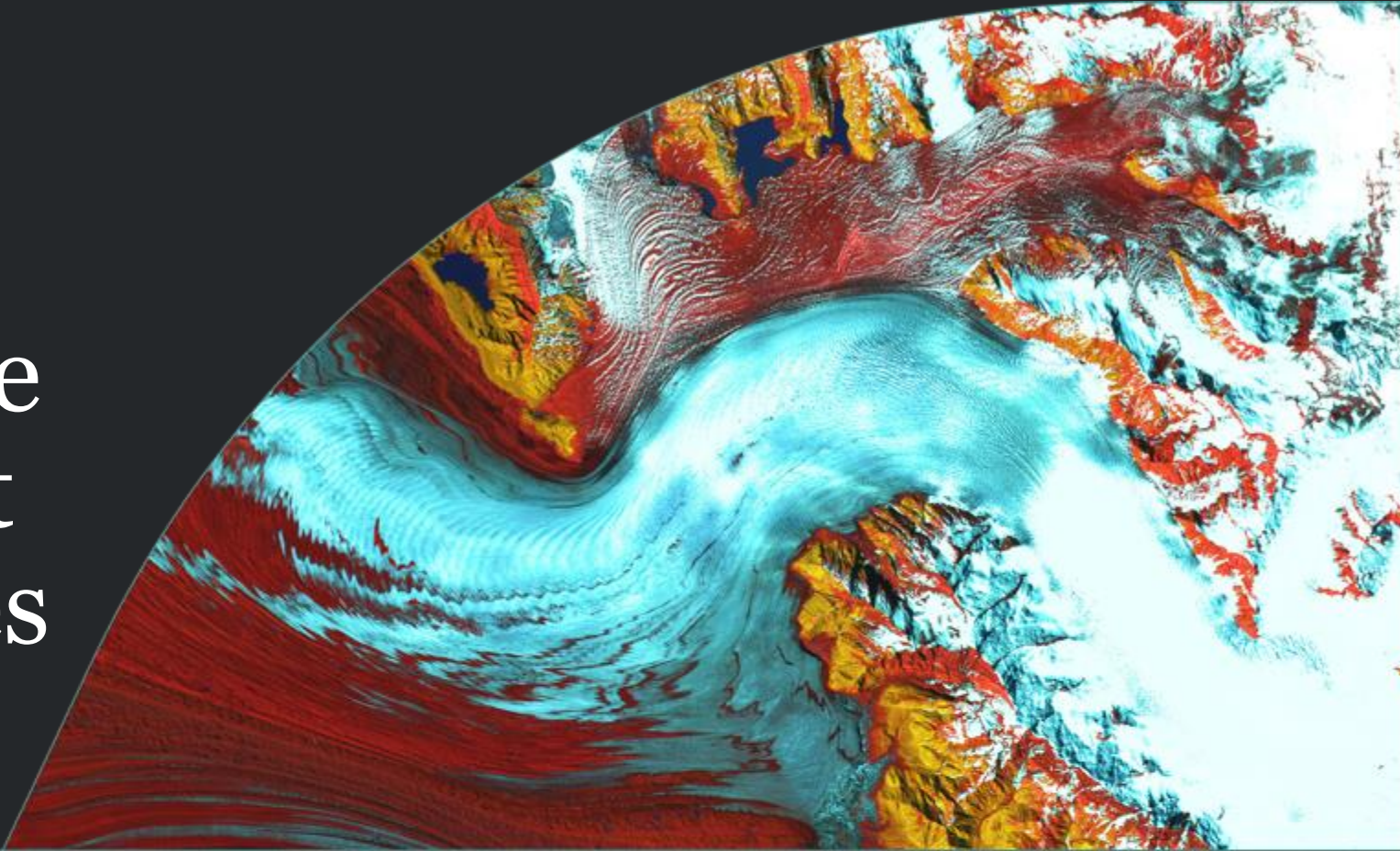
- An advisory firm with an exclusive focus on the energy transition.
- A team of engineers, scientists, auditors, consultants, and researchers passionate about their work.
- Living and working at the intersection of climate policy, innovative technologies, and the carbon marketplace.
- Helping clients navigate the disruption caused by carbon emissions and climate change.



Why EcoEngineers?



EcoEngineers Life Cycle Assessment (LCA) Capabilities



Take action

Asset Development:

Helping you navigate project development – from concept to commissioning.

Life Cycle Assessment:

Carbon accounting methodologies, carbon modeling tools, product carbon declarations, and more.

Compliance:

Comprehensive compliance support, compliance management, and training programs to ensure strong data control and quality.

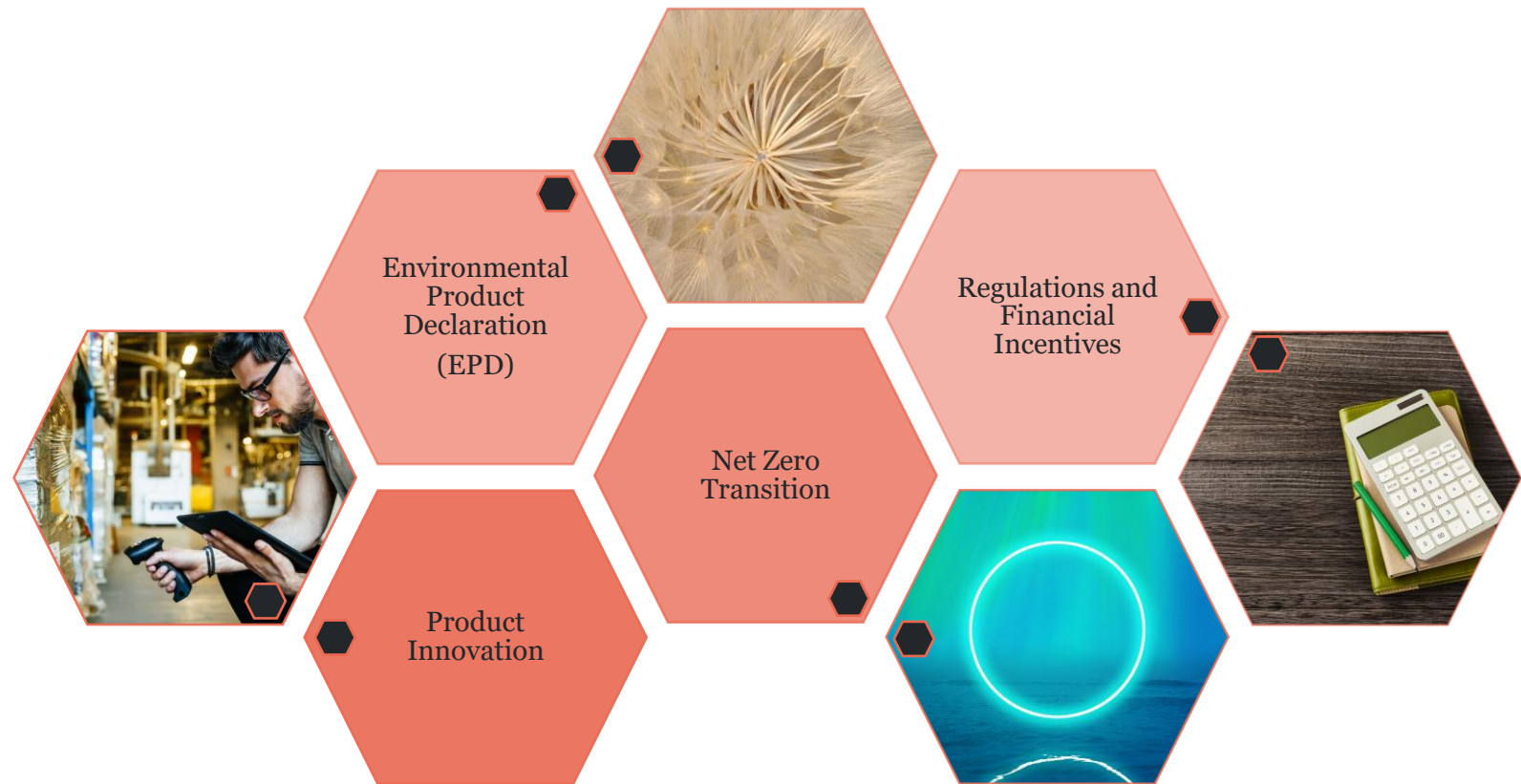
Regulatory Engagement:

Regulatory strategy development and execution, regulatory interpretations, advocacy.



LCA as a critical tool to inform and enable product sustainability

LCA provides companies with invaluable insights for decision making:



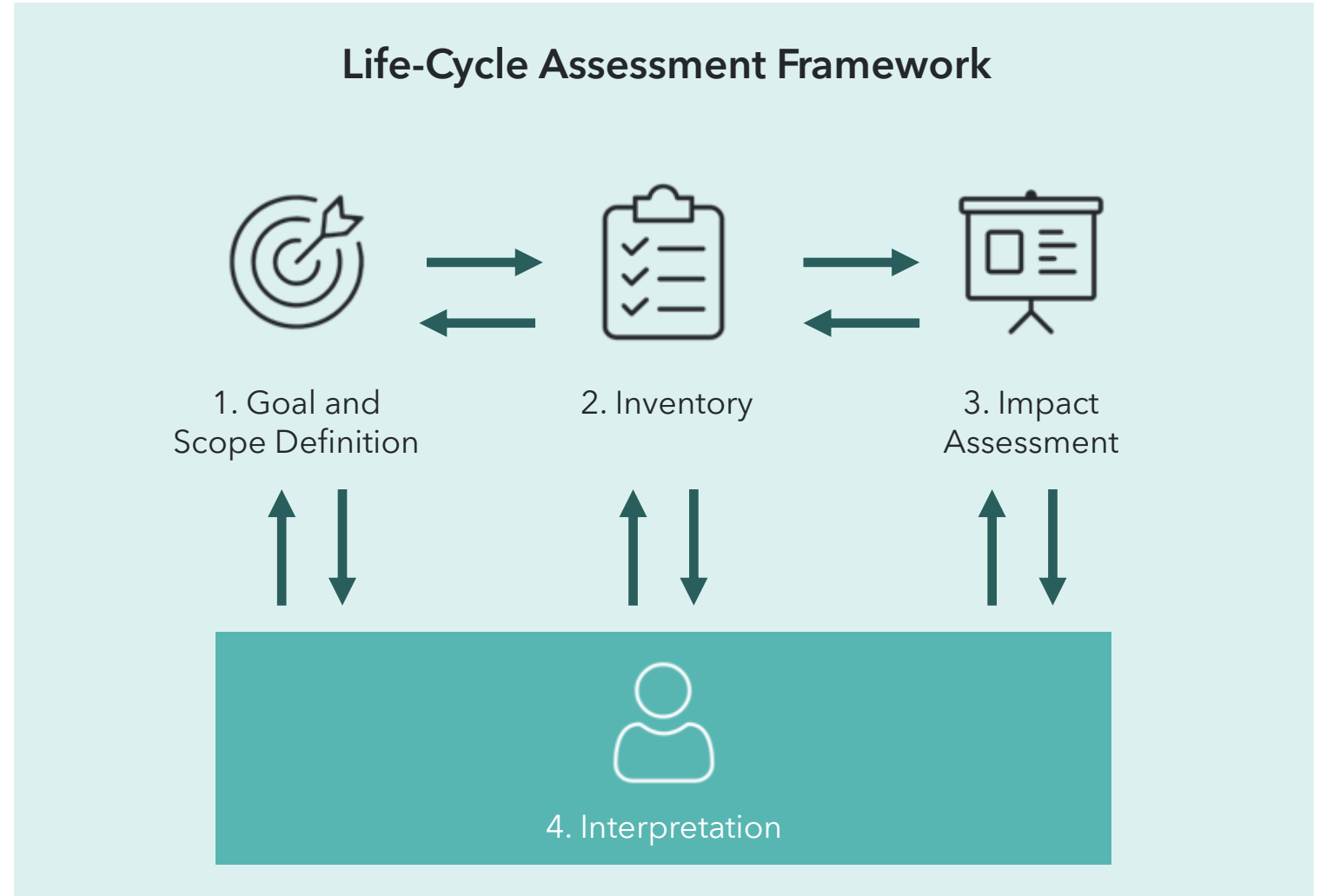
LCA helps you measure the environmental impact of omega-3 production—from raw material sourcing (like fish oil, algae or seed oil) to final product delivery—so you can improve sustainability, meet regulatory and consumer demands, and differentiate your brand in a competitive market.

What is LCA?

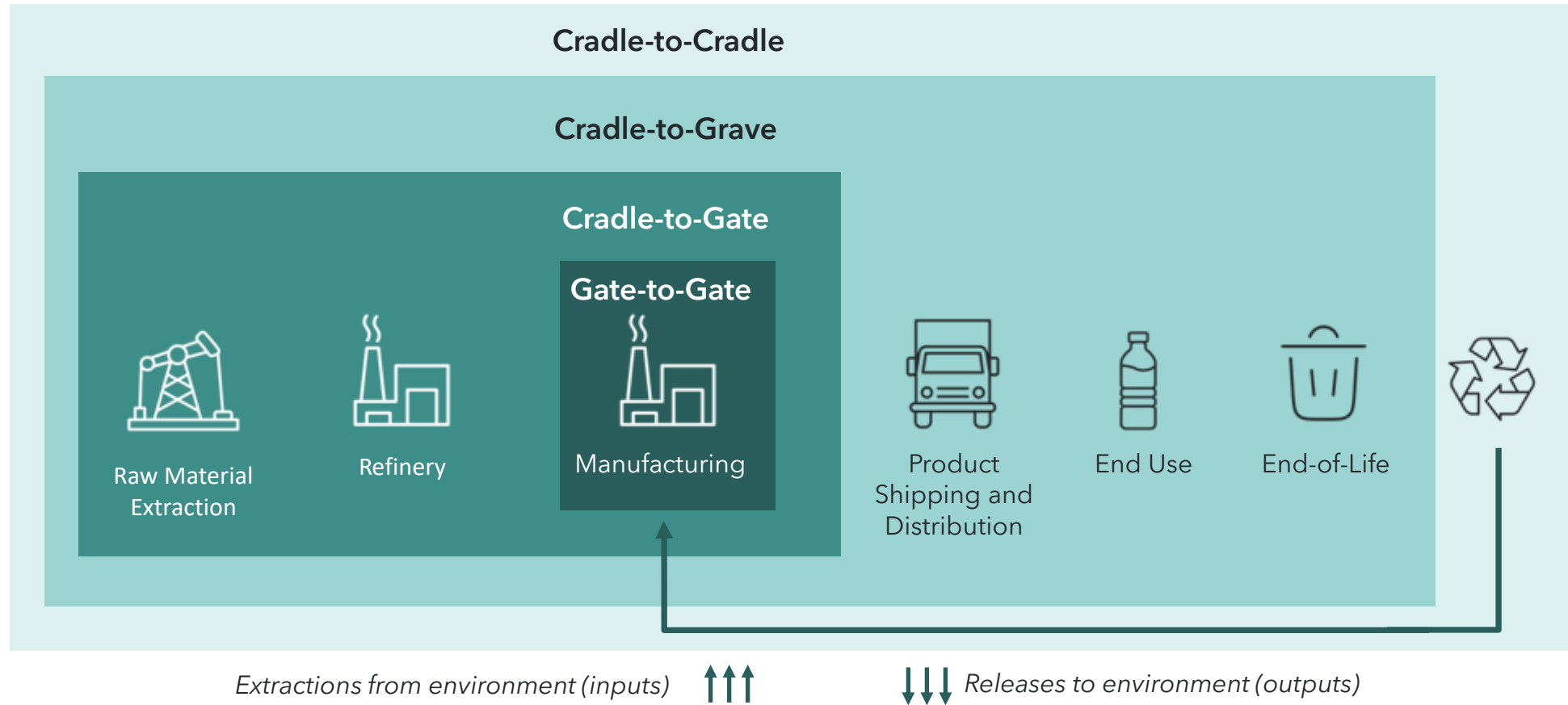
- **Life-cycle assessment (or LCA) is the systematic and fact-based analysis of the potential environmental impacts associated with products or services during their entire life cycle**
- **Follows ISO 14040 & 14044; a part of ISO 14000 Environmental Management family**
- **Uses of an LCA:**
 - Compare existing products with alternatives
 - Improve product design
 - Inform and educate external stakeholders, including legislators
 - Support product claims
 - Comply with regulations



Phases of an LCA: A Dynamic and Iterative Process



What the boundaries of an LCA look like?



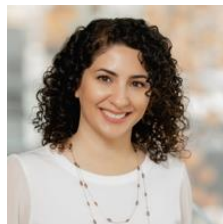
What inputs and outputs, and unit processes are relevant to the analysis?



Meet EcoEngineers' LCA Team



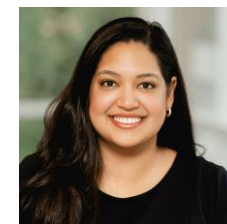
Life-Cycle Analysis Director
Zhichao Wang, Ph.D.



Manager
Ghasideh Pourhashem, Ph.D.
Chemicals & Polymers



Manager
Logan Leduc
Clean Fuels



Team Lead
Juliana Johnson
Product LCA & Corporate
Sustainability



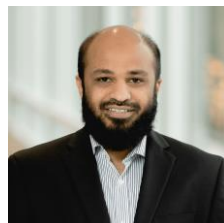
Team Lead
Ranjan Parajuli, Ph.D.
Agricultural Systems



Team Lead
Chris Rogers
Low Carbon Fuels



Senior Carbon Consultant
Chirjiv Anand, Ph.D.
Construction Materials



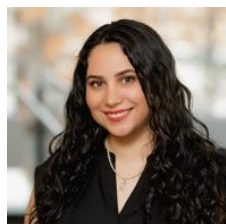
Carbon Consultant
Mosleh Uddin, Ph.D.
Low Carbon Fuels



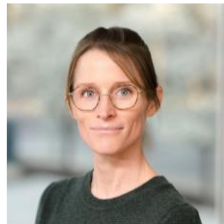
Carbon Consultant
Omid Karami, Ph.D.
Land Use Change



Senior Carbon Consultant
Gabriel Miranda, M.Sc.
Low Carbon Fuels



Senior Carbon Consultant
Aryan Azari, Ph.D.
Direct Air Capture



Carbon Consultant
Melissa Rickman, Ph.D.
Water and Wastewater



Carbon Consultant
Thierry Larue
Canadian Clean Fuels



Carbon Consultant
Margarita Valldejuly, M.Sc.
Carbon Reporting and Disclosure

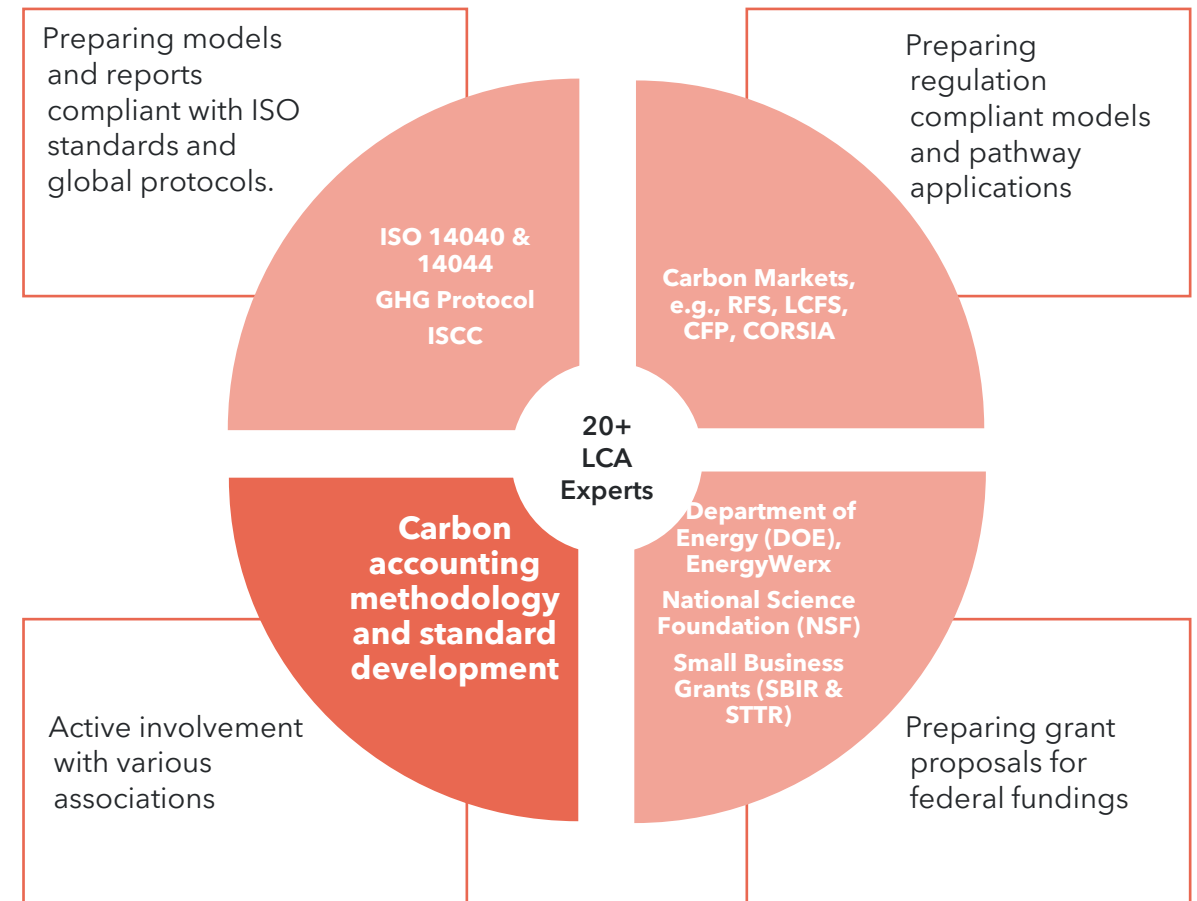
What Life Cycle Assessment Means at EcoEngineers

Evolving clean energy regulations and product and corporate voluntary carbon disclosure guidelines require an accurate measurement of carbon usage and greenhouse gas emissions from “cradle to grave” and across Scope 1, 2, and 3 emissions.

We have helped clients prepare or improve their processes, lower their carbon footprint, and submit winning pathway petitions.

We will support you with your big-picture business strategies and decision-making to reach your carbon management goals and measure your emissions reductions accurately.

Our Core LCA Competencies



Software and Tool Proficiencies: SimaPro , CA-GREET & GREET, Sphera LCA (fka GaBi), OpenLCA, GHGenious

General Overview of LCA Methodology Development

Map Value Chain

- Understand and outline typical processes, inputs and outputs

Identify Key Processes

- Identify the most environmentally significant stages and types of impact across the supply chains

Set Reference Flow

- Standardize unit processes and flows for consistency across supply chains



For GOED

Helping GOED create guidance and best practices for
LCAs in the Omega-3 industry



GOED LCA Methodology Project Team



Ghasideh Pourhashem
Carbon Consultant Manager, LCA



Ranjan Parajuli
Senior Carbon Consultant, LCA



Lauren Tarde
Project Manager

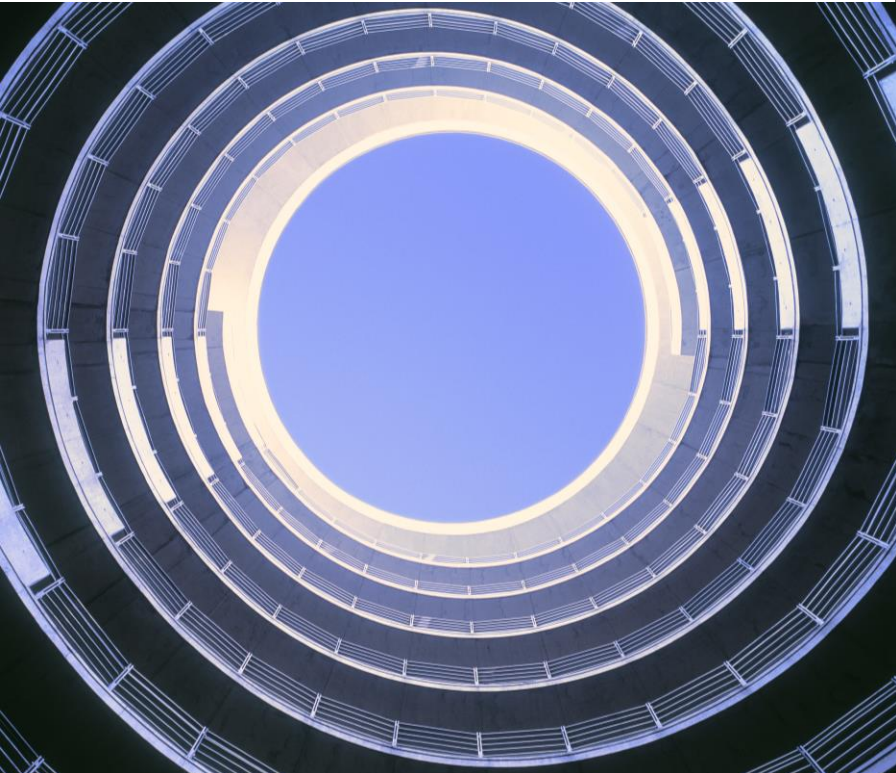


Juliana Johnson
Carbon Consultant Team Lead, LCA



Melissa Rickman
Carbon Consultant, LCA

What you can expect from this project



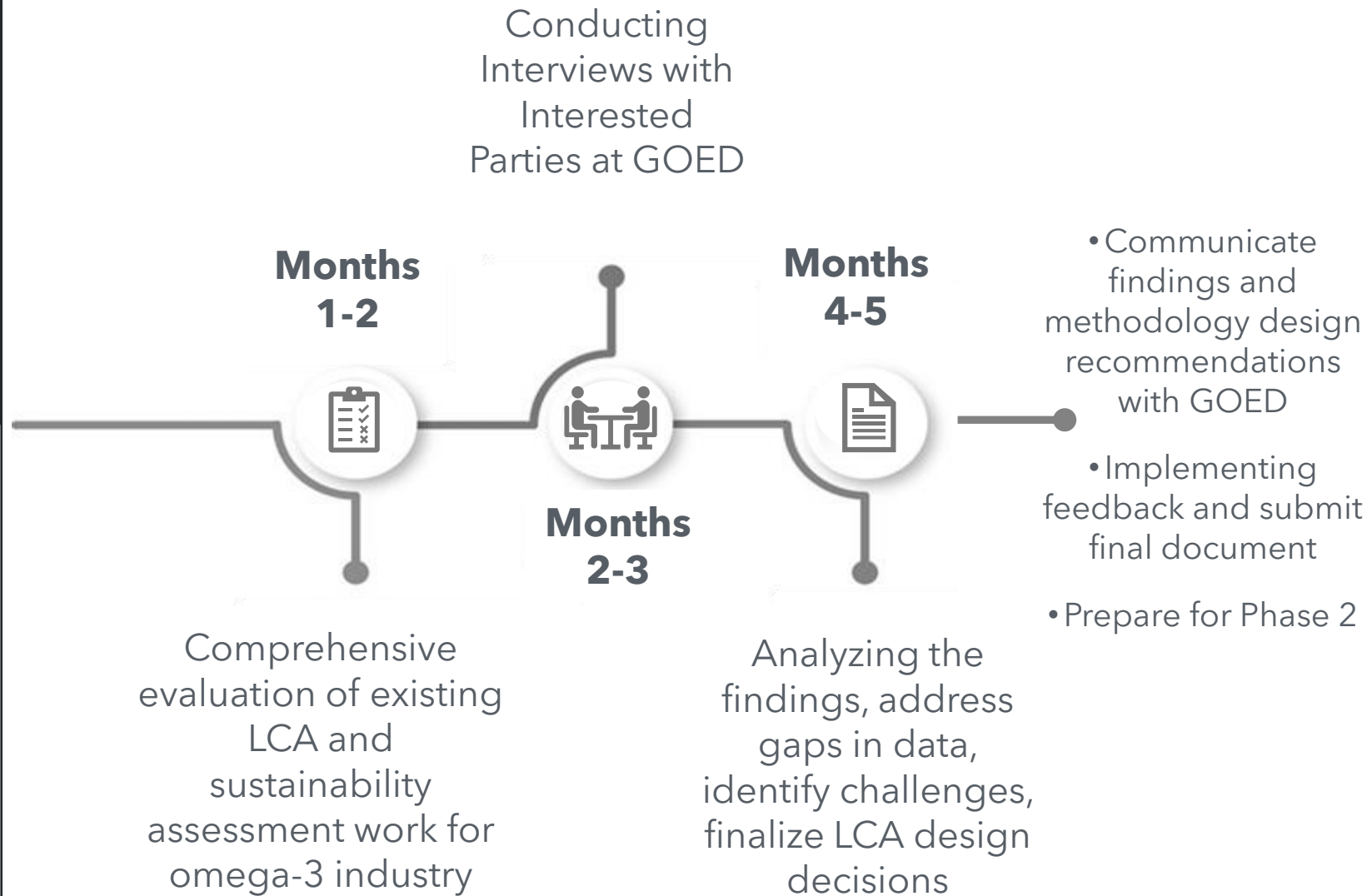
Task 1: Understand the Landscape & Align on Direction

- **Deliverable** | Summary Report covering:
 - Industry baseline
 - Key challenges
 - Design decision inputs for LCA methodology

Task 2: Develop a High-Level LCA Framework

- **Deliverable** | Draft LCA framework summarizing design principles and guidance for future development and alignment

Implementation Roadmap for Task 1



Step 1:

Align objectives and evaluate LCA practices in Omega-3 industry

- **Objective:** Define the guidance document's purpose, align sustainability goals, and evaluate current Omega-3 LCA practices

- **Activities**

1. **Kickoff and align on objectives:** Define the purpose of the guidance document, emphasizing sustainable practices in the Omega-3 industry, and identify the target audience, including GOED's members, producers, suppliers, and stakeholders
2. **Review current state:** Assess LCA processes relevant to the Omega-3 industry, summarizing existing practices, standards, challenges, and opportunities through interviews with select GOED members

Deliverable: Document that highlights best practices for LCA and findings and insights from LCAs already conducted by GOED members

The LCA experience of Austral Group

For the Sustainability Committee - GOED
Didier Saplana – COO



Austral Group S.A.A.
Austevoll Seafood Company



Our Business

- FISHING COMPANY LOCATED IN PERU
- MAIN OWNER: AUSTEVOLL SEAFOOD (NORWAY)
- AFFILIATED CO.: EPAX (NORWAY)
- 1 RAW MATERIAL: ANCHOVY
- 2 CO-PRODUCTS: FISHMEAL (80-90% VOLUME) & CRUDE FISHOIL (10-20%)
- ANNUAL CRUDE FISHOIL PRODUCTION: 9,360 TONS (2020-2024 AV.)
- 70-80% FISHOIL SALES TO OMEGA3 REFINERIES

Peruvian Anchovy
Engraulis Ringens



Our environmental journey

MITIGATION PLANS & ENVIRONMENTAL PERFORMANCE DRIVEN BY REGULATORY COMPLIANCE



2009



2018



2022 –
2024

MITIGATION PLANS DRIVEN BY INCENTIVES (REPUTATIONAL/MARKET/FINANCIAL DRIVEN)

- MAXIMUM LIMITS ON EFFLUENTS AND AIR EMISSIONS
- RESIDUES DISPOSAL
- MANDATORY USE OF NATURAL GAS FOR BOILERS WHENEVER AVAILABLE
- QUOTA SYSTEM FOR THE ANCHOVY FISHERY
- LOCAL AND DIRECT IMPACTS, REDUCED SCOPE
- AUTHORITIES, FISHERMEN AND LOCAL COMMUNITIES AS MAIN STAKEHOLDERS

- CORPORATE FOOTPRINT SINCE 2018
- RECYCLING PROGRAMS SINCE 2020 & 2021
- ENERGY EFFICIENCY COMMITTEE SINCE 2022
- LOCAL AND GLOBAL IMPACTS, LARGER SCOPE
- LARGER SET OF STAKEHOLDERS

LCA
(published
30/04/2024)

Highlights



- Life cycle environmental impacts of Peruvian fishmeal and fish oil were analyzed.
- On average, 320 and 4,430 kg CO₂eq are emitted from the production of 1 t of fishmeal and 1 t of fish oil, respectively.
- Diesel combustion during fishing and fuel used in transformation processes were dominant in most impact categories.
- Transport is one of the main drivers of environmental impacts for fishmeal, but not for fish oil.
- Peruvian fishmeal and fish oil showed the best performance in most impact categories when compared to worldwide studies.



Aquaculture

Volume 600, 30 April 2025, 742239



Identifying current trends in the environmental impacts linked to fishmeal and fish oil production in Peru

Alejandro Deville ^a  , Ian Vázquez-Rowe ^a, Angel Avadí ^{b c}, Fernando Miranda ^d,
Ramzy Kahhat ^a

<https://doi.org/10.1016/j.aquaculture.2025.742239>

[Link to the article](https://doi.org/10.1016/j.aquaculture.2025.742239)

Why an LCA ?

IT WAS MARKET DRIVEN

STARTING POINT: COMPETITIVENESS OF FM/FO IN THE SALMON FEED FORMULATION & ITS POTENTIAL REPLACEMENT AS AN INGREDIENT

B2B, COMPETING VS. ALTERNATIVES BASED ON CRITERIA

- AVAILABILITY, SPECS, COST, TRACEABILITY, GOOD PRACTICES (TRAD. CRITERIA)
- SUSTAINABILITY RECORD (INCL. FISHERY STATUS, ENV. IMPACTS, ESPECIALLY CARBON FP) (RECENT)

"To guide these decisions (replacing feed ingredients), Life Cycle Assessment (LCA) data is essential."

"We expect our suppliers to provide high-quality, primary LCA data. We're prioritizing suppliers with lower environmental footprints—not just between different ingredient types, but also between suppliers of the same ingredient. This allows us to make more informed decisions about sourcing and formulation," ... "We'll continue working to reduce our Scope 3 emissions..."

Skretting's CEO Bastiaan van Tilburg,
Aquafeed.com, June 20th

Why an LCA ?

ONLY 1 SIMILAR REQUEST FROM FISHOIL CUSTOMERSWITH SAME LOGIC

EXPECTED DELIVERABLES FROM THE LCA

WHAT IS THE CARBON FP OF OUR PRODUCTS ? VS.
COMPETING INGREDIENTS ? (INITIAL)

WHERE DO WE STAND WITH OTHERS
ENVIRONMENTAL IMPACTS ? ANY OPPORTUNITY ?

DO WE NEED TO RE-FORMULATE OUR PLAN
TO MITIGATE IMPACTS ?

HOW DO WE CALIBRATE OUR STRATEGY AND
COMMUNICATION ACCORDINGLY ? (DISCLOSURES & CLAIMS)



Lessons learnt from the process ?

- ✓ Red Peruana Ciclo de Vida y Ecología Industrial (PELCAN), Departamento de Ingeniería, Pontificia Universidad Católica del Perú (PUCP), Lima, Perú
- ✓ Research team:
 - Alejandro Deville del Águila, MSc, contract researcher and PhD candidate
 - Ángel Avadí, PhD, senior researcher at CIRAD (France)
 - Ian Vázquez Rowe, PhD, senior professor PUCP
 - Ramzy Kahhat, PhD, senior professor PUCP
- ✓ Project Management at PELCAN-PUCP
 - Ian Vázquez Rowe, PhD, senior professor PUCP

NEED A SPONSOR FROM TOP
MANAGEMENT

FIND RIGHT
PARTNER, WITH
EXPERTISE BOTH LCA
AND (PERUVIAN)
FISHING SECTOR

DEVELOP YOUR OWN EXPERTISE,
WITH IN-HOUSE SPECIALIST
(FERNANDO MIRANDA)



Lessons learnt from the process ?

LCA IS BASED ON ASSUMPTIONS

SELECT BOUNDARIES (FISHING, PROCESSING, SHIPMENT TO PORT OF DESTINATION) - MATCH WITH SCOPE 3 OF OUR CUSTOMERS. NOT INCLUDING DISTRIBUTION , MATERIAL RECYCLING, HQ, HC BUSINESS

GET PRIMARY DATA AVAILABLE (>97%)

ALLOCATION METHOD ? DIFFERENT CONCEPTS. CALCULATE 3 AND SELECT 1 (ENERGY CONTENT-BASED)

THINK INDUSTRY AND CATEGORY MORE THAN INDIVIDUAL COMPANY

SELECT ADECUATE TOOLS: ISO 14067 STANDARD, SIMAPRO 9.4.0.2 SOFTWARE, ECOINVENT 3.8/ReCiPe 2016/IPCC 2021 DATABASES

SELECT YEAR(S) OF REFERENCE (2019 & 2021)



Lessons learnt from the process ?

INCREASED NUMBER OF ENV. IMPACTS VS.
TRADITIONAL REFERENCES (AIR
EMISSIONS/EFFLUENTS/RESIDUES)

LEARNT MORE ABOUT OTHERS IMPACTS
QUESTIONED MATERIALITY.

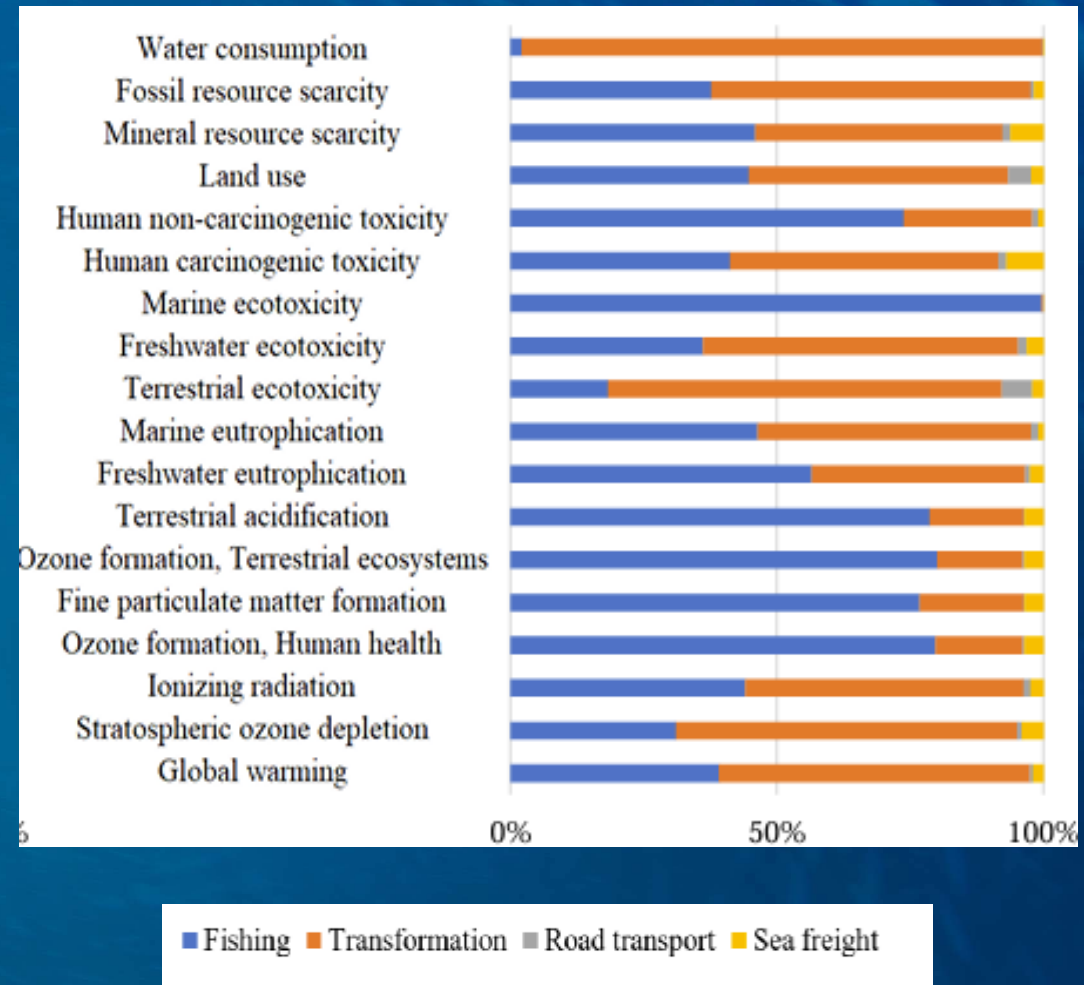


Figure 5. Weighted average relative midpoint environmental impacts of the production and transport considering an energy allocation per FU. Left: Fishmeal. Right: Fish oil

Lessons learnt from the results ?

2 HOTSPOTS FOR THE FISHING INDUSTRY,
AND REQUIRED BY OUR CUSTOMERS

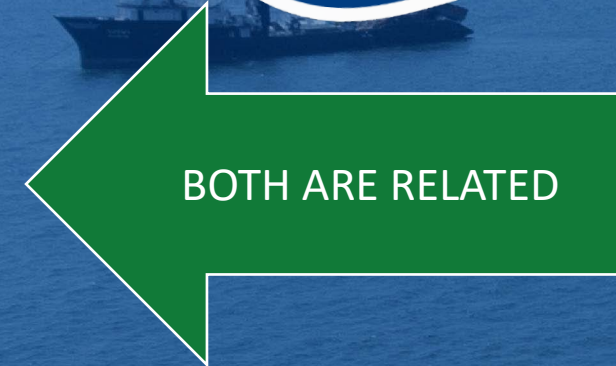
GLOBAL WARMING THROUGH CARBON FOOTPRINT
OF OUR PRODUCTS

ADAPTATION TO CLIMATE CHANGE THROUGH
RESPONSIBLE MANAGEMENT OF THE FISHERY
(RESPONSIBLE SOURCING)

NEW HOTSPOTS FOR CUSTOMERS AND
REGULATORS: WATER CONSUMPTION,
LAND USE, PLASTICS,

ENERGY EFFICIENCIES IN FLEET
AND PLANT ARE RELATED TO
FISH QUALITY & AVAILABILITY.

BOTH ARE RELATED



Lessons learnt from the results ?

THE HIGH VARIABILITY IS A FEATURE OF OUR MARITIME ECO SYSTEM (EL NIÑO SOUTHERN OSCILLATION)



THE OIL YIELD OF ANCHOVY HAS A SIGNIFICANT IMPACT ON RESULTS

MULTI YEARS DATA INCLUDING NIÑO YEARS

FUEL CONSUMPTION AS MAJOR SOURCE OF IMPACTS



TECHNOLOGICAL & EFFICIENCY IMPROVEMENTS IN PERU

INTENSITY TARGETS, AND NOT ABSOLUTE REDUCTION TARGET (IN THE SHORT/MID TERM)

Lessons learnt from the results ?

OUR FISH OIL CARBON FP INCLUDES FEED OIL AND IS NOT RELATED TO THE CONTENT OF OMEGA 3. METHODOLOGY FOR AN OMEGA 3 OIL FP ?

NEW IMPACT CATEGORIES AND UPDATED MATERIALITY

LCA WILL EVOLVE OVER TIME

BioSustain LCA v.7

Biomar's website

PERUVIAN FISHOIL INDUSTRY REGISTERS GOOD SCORES ON MANY ENV. IMPACTS COMPARED TO ALTERNATIVES

UPDATED LCA ARE RELEVANT FOR:
INDUSTRY COMPETITIVENESS
REPUTATION
NEW REGULATIONS

DISCOVERED LOT OF UNFOUNDED CLAIMS
DAMAGING REPUTATION

Obstacles in Peru

- ☐ LCA METHODOLOGY NOT YET A REGULATORY REQUIREMENT IN PERU.
- ☐ LIMITED MARKET INCENTIVE WHEN MOST SALES ORIENTED TO CHINA. OMEGA3 REQUIREMENTS ?
- ☐ CORPORATE CARBON FOOTPRINT MORE IMPORTANT IN PERU AT THIS POINT, NOT SUSTAINED BY AN LCA, INCENTIVATED BY MINISTRY OF ENVIRONMENT (HUELLA CARBONO PERU), BUT MANDATORY FOR LISTED COMPANY OR INTEGRATED REPORTING FROM EUROPEAN SHAREHOLDER.
- ☐ LIMITED UNDERSTANDING OF IMPORTANCE. CONSIDERED AS A TECHNICAL TOOL MORE THAN MANAGEMENT TOOL.

Main take aways

- ☐ WORTHWHILE
- ☐ ONGOING JOURNEY, V1 WILL PREPARE V2
- ☐ NEED A GOOD INCENTIVE TO START
- ☐ NEED A GOOD SUPPORT TO EXECUTE



Agenda

Next Committee Calls

- August 20, 2025 | [[Click for your local time](#)]
 - Topic: TBD
- September 17, 2025 | [[Click for your local time](#)]
 - Topic: TBD

Thanks for joining us.

