

Today's Agenda

- Call to Order
- Antitrust Statement (Leiter)
- Introductions
- ILMA Sustainability Goals for Next 2 Years (Ramesh and Min)
- “Simplifying Sustainability” (Matt)
- Regulatory and Legal Updates for Sustainability (ILMA Legal)
- ILMA Future Focus on Sustainability (Tony)
- Support of ASTM E50.07 (John Howell)
- Q&A
- Adjourn

ILMA Sustainability Committee

2 Year Committee Goals

ILMA Annual Meeting 10-2024

Ramesh Navaratnam and Dr. Min Chen

ILMA Sustainability Committee

Dr. Matthew Kriech - Biosynthetic Technologies

Ramesh Navaratnam - Patech Fine Chemical

Dr. Min Chen - Advancion

Tony Springer - US Lubricants

Danielle Fish - RichardsApex

Dr. Shannon McGee - Quaker Houghton

2 Year Goals

- Recruit a Sustainability Committee comprised of Supplier and Manufacturing Members - Target 6 members
 - Meet Monthly for ~ 1 hour
 - Meet 2nd Thursday each Month at 1 PM ET
 - Only committee officers require to attend annual, engage meeting
- Organize a fact sheet of all current legislation and regulatory requirements as it relates to Sustainability and track progress for our members
 - Report out to members at Annual and Engage
- Continue to support Sustainability Education of the ILMA members
 - Speakers/Presentation at Engage and Annual Meeting
 - Video release in between Engage and Annual meetings

2 Year Goals

- Recommend simple tools to allow ILMA member to address sustainability when needed
 - EPA Spreadsheet and Education for Scope 1,2, and 3 emissions
 - Recommended 3rd parties for LCA/PCF calculations (we recommend ISO standards always be used, not industry developed standards)
- Build a PEFORMANCE program to show the benefits of carbon reduction through the use of high-performing lubricants and build a messaging campaign that shows how ILMA members are helping create a more sustainable world.
 - Collect existing case studies to share with members
 - Consider ILMA program to generate data for marketing as required
 - Reach out to member to share case study success stories

Questions / Feedback



ILMA Sustainability Committee

Simplifying Sustainability

ILMA Annual Meeting 10-2024

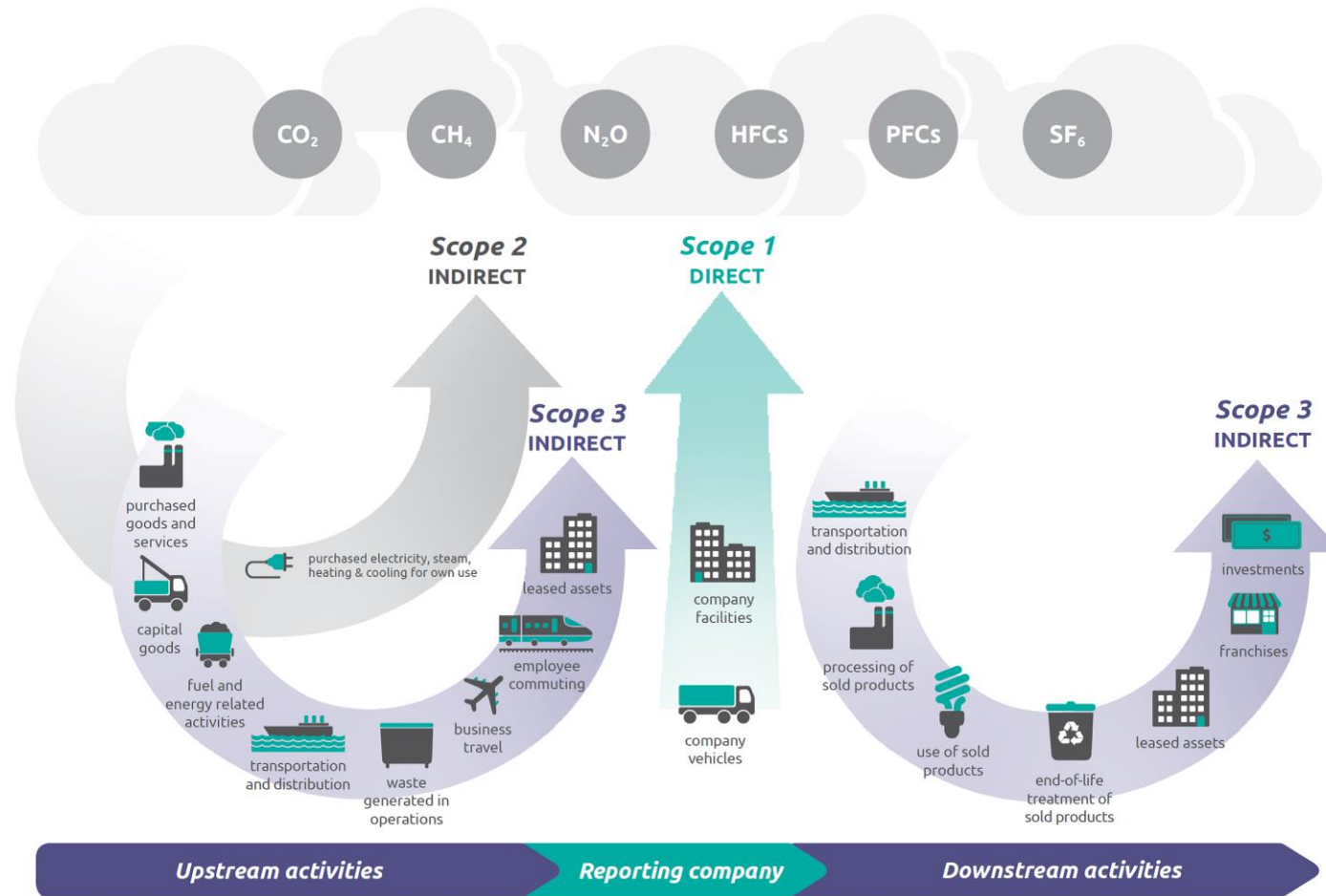
Dr. Matthew Kriech

Simplifying Sustainability

Realistically if you have been approached by a customer on Sustainability 1 of 3 scenarios are requested:

- 1 (Easy) - Do you have a Sustainability Program - YES and DONE
- 2 (Moderate) - Have you calculated your Scope 1&2 Emissions
- 3 (Hard) - Do you have a LCA or PCF for your product

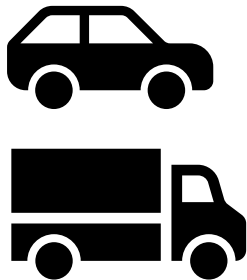
Scope 1-2-3 Emissions



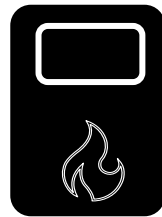
Scope 1 Emissions

Direct Emissions for Your Organization

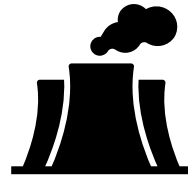
Fleet



Stationary
(Natural Gas
or Fuel Oil)



Process

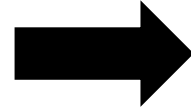
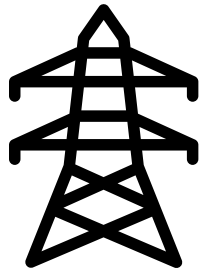
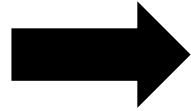
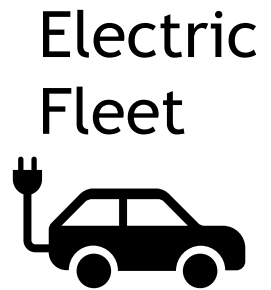


Fugitive



Scope 1 Emissions

Direct Emissions for Your Organization

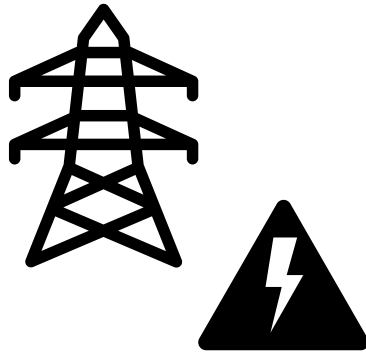


Scope 2

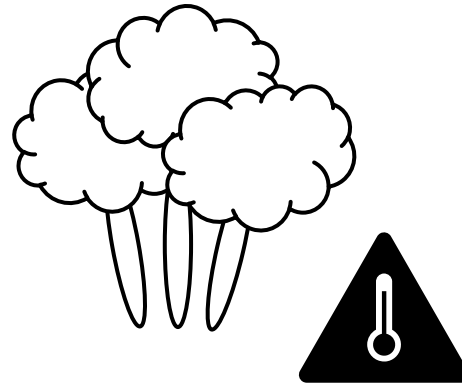
Scope 2 Emissions

Indirect Emissions Upstream from Your Organization

Purchased
Electricity



Purchased
Steam



Scope 3 Emissions

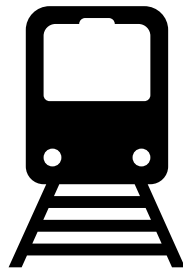
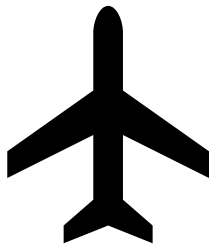
Indirect Emissions Upstream and Downstream from
Your Organization (Emissions of Your Value Chain)



Scope 3 Emissions

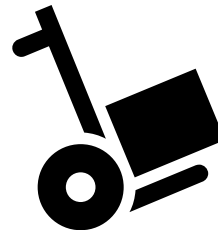
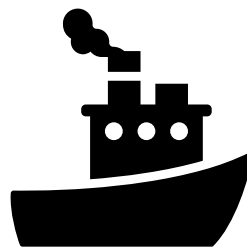
Indirect Emissions Upstream and Downstream from Your Organization (Emissions of Your Value Chain)

Upstream



Employee Commute

Downstream

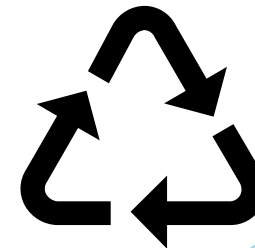


Distribution

Logistics Post Delivery

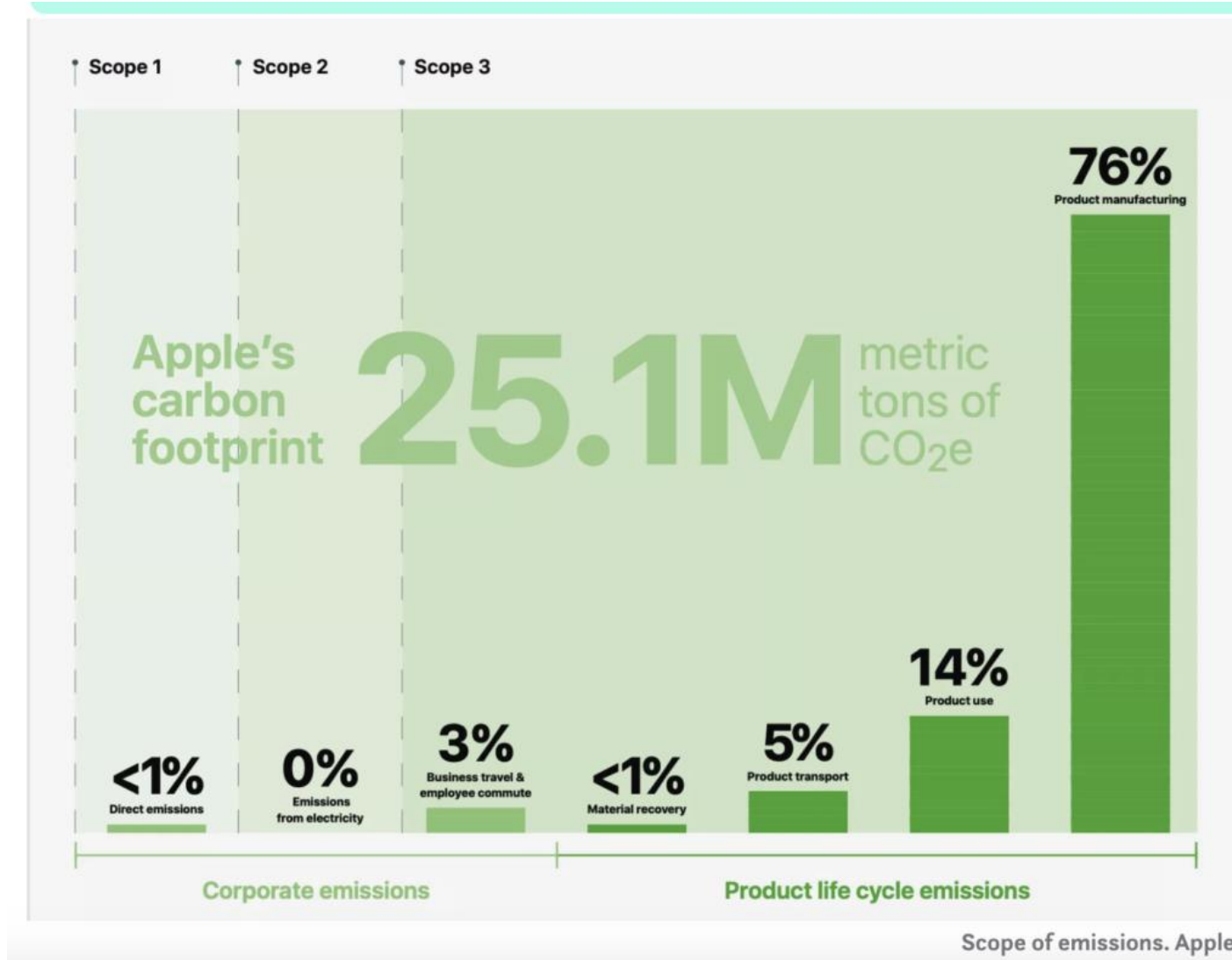
Waste Handling

Recycling



Scope 1-2-3 Apple

Credit: Apple



Our Recommendation - Scope 1 and 2

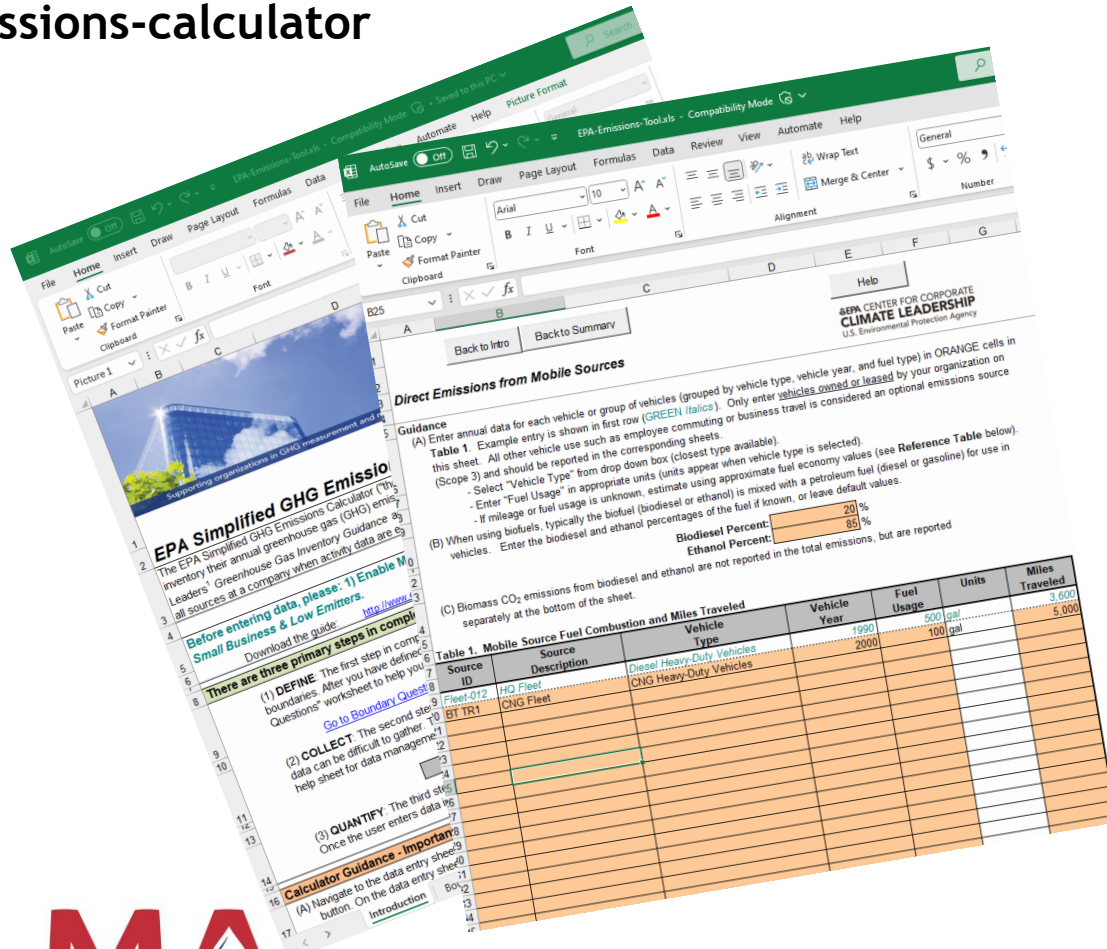
<https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator>

Use the FREE Excel Tool From the EPA

Relatively straight forward to use, just need your data organized (fleet info, electricity data, natural gas usage etc.)

Great project for an Engineer Intern over the summer!

We will be doing a demo video of the tool for ILMA Membership in the next couple months!



LCA and PCF

LCA = Life Cycle Assessment

PCF = Product Carbon Footprint (Really a subset of LCA)

LCA - Our Scope Selections

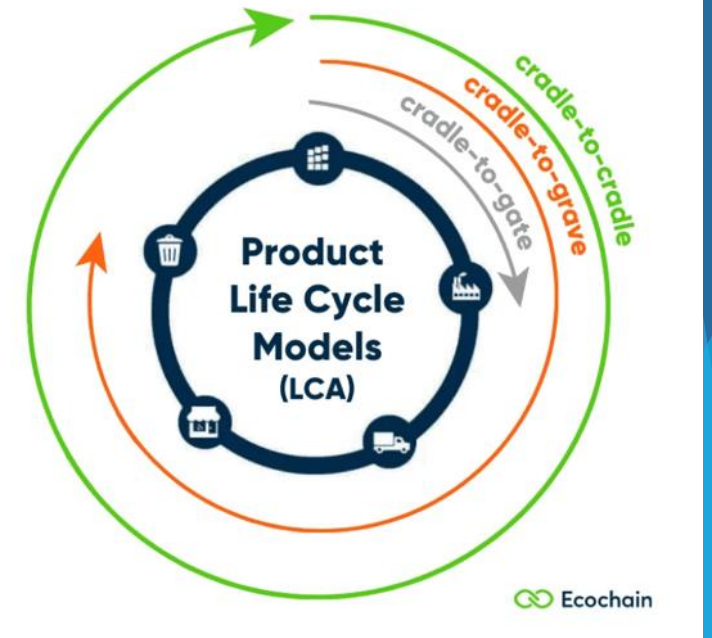
- LCA was developed to be an internationally standardized methodology to assess the environmental impact of product systems (ISO 14040 & ISO 14044). ISO 14067 is a subset of these standards, focused on carbon footprints.
- ISO standards require **3rd party critical review of LCA**, if data is intended to be used to support marketing claims or make comparative assertions. LCA completed by **Environmental Resource Management** and **Audited by Dr. Matthias Finkbeiner** from **Technical University Berlin, Germany**
- While the general methodological framework is defined by the standards, there are still lots of choices to make when finalizing the goal/scope of the project

Impact Categories

- **Climate Change**
- Ozone Depletion
- Acidification
- Eutrophication
- Ecotoxicity
- Human Toxicity
- Water Use
- Land Use
- Particulate Matter Emissions
- Many others...

Scope Types

- Cradle-to-grave
 - Raw materials
 - Manufacturing
 - Distribution
 - Use
 - Disposal
- **Cradle-to-gate**
 - Raw materials
 - **Manufacturing**



Project Definition

System Boundary: *Cradle-to-gate*

- Includes raw material extraction/harvesting, inbound raw material transport, packaging for inbound/outbound materials, manufacturing activities, waste management, associated energy use/water/steam

Included	Excluded
<ul style="list-style-type: none">■ Raw material extraction/ harvesting	<ul style="list-style-type: none">■ Capital goods and infrastructure
<ul style="list-style-type: none">■ Inbound raw material transport	<ul style="list-style-type: none">■ Employee commute
<ul style="list-style-type: none">■ Packaging for inbound and outbound materials	<ul style="list-style-type: none">■ Outbound distribution (i.e., after materials leave the factory gate in India)
<ul style="list-style-type: none">■ Manufacturing activities	<ul style="list-style-type: none">■ End of life
<ul style="list-style-type: none">■ Waste Management	<ul style="list-style-type: none">■ Consumer use
<ul style="list-style-type: none">■ Associated energy use, water, steam	
<ul style="list-style-type: none">■ Packaging and Transportation of co-products to deliver them to beneficial reuse site	

Project Definition

Impact Category: *Climate Change (Global Warming Potential)*

- Four greenhouse gas (GHG) sources/sinks were considered, in units “kg CO₂e” (GWP100):
 1. **Fossil Emissions** = emissions from fossil-derived carbon sources (e.g. coal, oil, natural gas, etc.)
 2. **Biogenic Emissions** = emissions from bio-derived carbon sources (e.g. trees, crops, plants, grasses, algae, etc.)
 3. **CO₂ Uptake** = emissions captured by biomass sources (“carbon sinks;” negative emissions associated with any biomass used in the process, which includes castor oil, biomass fuel, etc.)
 4. **Land Transformation** = emissions associated with land use, land use change, and land occupation impacts (transformation of organic carbon content in the soil)

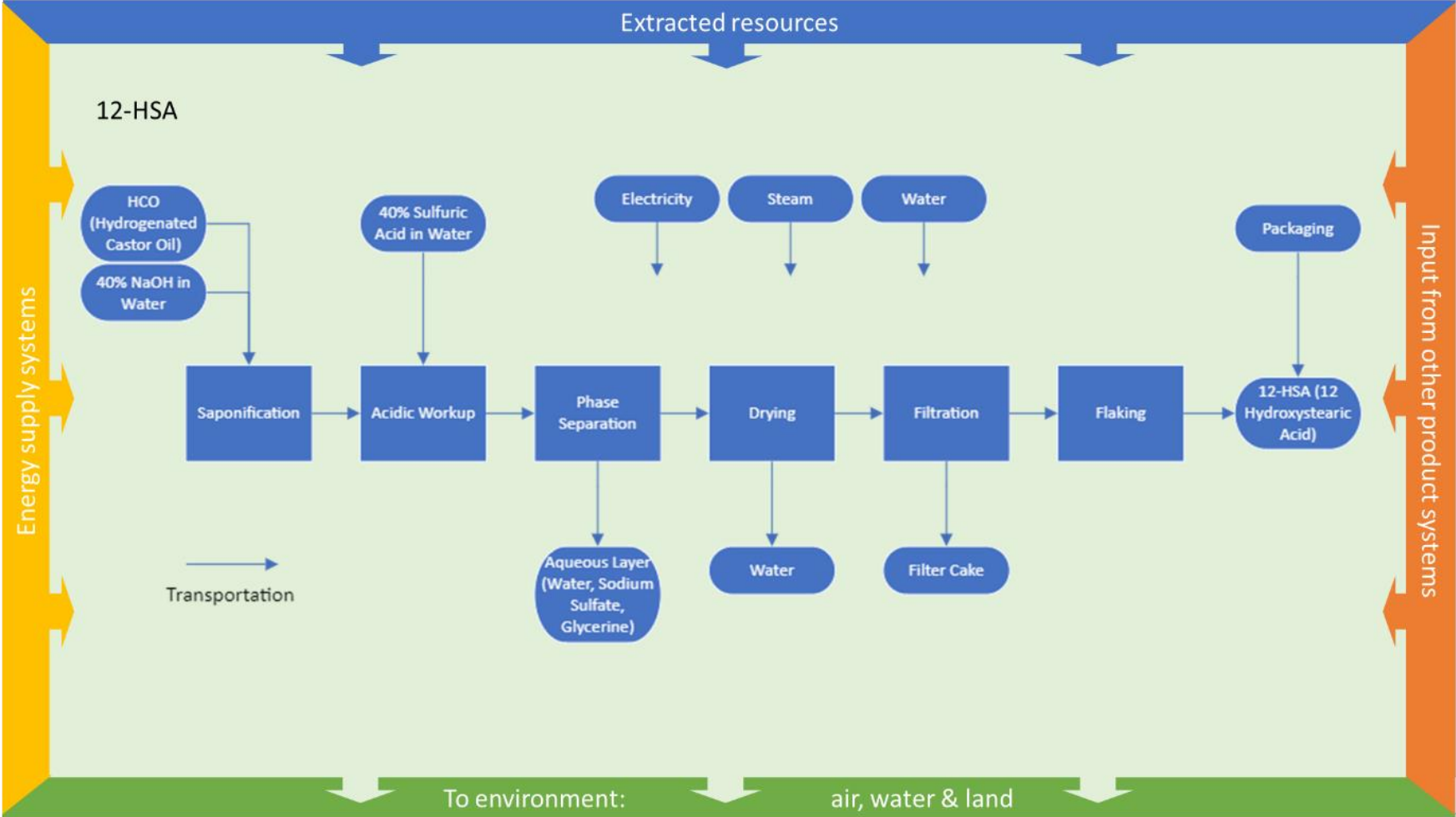
Products Evaluated

- Hydrogenated castor oil, 12-hydroxystearic acid, saturated estolides (low, mid, high viscosities), ricinoleic acid, polyricinoleic acid, and unsaturated estolides (mid viscosity only)

Databases & Software

- SimaPro v9.4.0.2 LCA simulation software was used to build the model
- Primary data was collected for all internally-controlled processes - Production Data from August 2021 to September 2022
- Ecoinvent 3.8 database was used as main secondary source of data (e.g. regional energy grids, non-castor materials)
- GaBi 2020 database was used for castor oil (more complete dataset than was in Ecoinvent)

Process Flow Diagrams



Summary of Emissions

	Castor Oil	Hydrogenated Castor Oil	12-Hydroxy- stearic Acid	Low Vis	Mid Vis	High Vis	Ricinoleic Acid	Polyricinoleic Acid	Mid Vis
Fossil Emissions	1592	1835	1797	2627	2507	2469	1563	1952	2443
Biogenic Emissions	33	360	636	924	1130	1156	267	643	977
CO2 Uptake	-2659	-2725	-2201	-1980	-2164	-2231	-2134	-2204	-2129
Land Transformation	386	385	301	383	329	318	303	304	331
Net Emissions	-648	-145	533	1954	1802	1712	-1	695	1622

Our Recommendations

- ▶ Hire a Reputable Firm that does LCA/PCF professionally (ask for examples)
- ▶ Ensure the use the ISO standards are followed:
 - ▶ ISO14040
 - ▶ ISO14044
 - ▶ ISO14067
- ▶ If being used for marketing claims ENSURE a 3rd Party Review!
- ▶ DON'T be in a hurry, done right this process can take from 3-4 months to over a year!
- ▶ Embrace the results