HOW TO COMMUNICATE LCA RESULTS EFFECTIVELY TO DRIVE BUSINESS DECISIONS
### GENERAL GUIDELINES

#### Managing Expectations
- Set expectations early
- The study will:
  - Require resources
  - Require commitment
  - Be iterative
- LCA is not:
  - A panacea
  - A risk assessment
- The results may:
  - Reveal actionable insights
  - Reveal surprising or counterintuitive results
  - Show no real differences in impacts of interest

#### Frame the Results
- Clearly convey functional unit, reference flows, system boundary, and assumptions
- LCIA:
  - Which impact categories were included, and why?
  - Which impact categories were the most impactful or relevant, and why?
  - Explain trends & trade-offs
- Use appropriate graphics:
  - Avoid implicit comparisons
  - Explain any normalization
- Convey limitations
- LCIA does not predict actual impacts
- LCIA should never be used as a sole basis for comparative assertions

#### Communicate Significance
- Communicate uncertainty along LCIA results
- Address how inherent uncertainties may influence the study results, conclusions, or recommendations
- If possible, convey how impactful the LCA study results are relative to some metric the audience can relate to

#### Tell the Story
- Know your audience
- Make your story meaningful to them
- Clearly state conclusions
- Explain rationale behind key findings
- Explain the reasons for the differences
- Provide actionable recommendations
- Convey the relative magnitude of relative results
- Consider a multi-level messaging strategy

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*Source: Environmental Life Cycle Assessment: Measuring the Environmental Performance of Products*

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[Image: EFFECTIVE COMMUNICATION OF LCA RESULTS-ACLCA WEBINAR 1/19/2016]
ORGANIZATIONAL INFLUENCERS

- Product Development Teams/Engineering
- Business Leaders
- Marketing Groups
- General Sustainability Training
- Sustainability Experts
- External Customers/Investors
PRODUCT DEVELOPMENT
TEAMS/ENGINEERING
SUMMARY

What has been successful:

- Customize the message to your audience! What types of media work best?
  - Webpage, poster, webinar, video, graphic, text/chart etc.
- Considerations (take away from each example as bullet)
  - Skilled in understanding complex topic.
  - Show the audience their opportunity
    - Solid evidence backed up by all the detail you have, let them look over the evidence in their own time
  - Expects data, not just stories. Focus on the data more than the conclusions. Story telling based on sustainable attributes
    - Capture examples and convert to detailed stories with photos etc.
  - If results don’t align with their expectations, may question validity of the study. Make limitations of the study clear without undermining credibility of the study. Show enough detail of the complexity to support conclusions.
  - Prefer something actionable as an outcome
  - Different functions are involved: sales, marketing, engineering and education
    - Leveraging content into existing channels and tools in sale department
  - Inspire, make results visual, meaningful and tangible. Emphasize the positives and awareness of trade-offs. Involve them to promote study results and support next steps.

What has NOT been successful:

- Sharing too much detail and exact numbers. LCA deals with ranges and approximations. Always share normalized data or percentages. Engineers take numbers very seriously to decimal point level.
HELP THEM APPRECIATE THE ANALYSIS

**Best Practice** – Show them the mess!

Showing a screenshot of the life cycle model can illustrate the complexity of LCA without adding confusing detail regarding the specific processes modeled.

This is what your life cycle looks like!

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HELP THEM APPRECIATE THE ANALYSIS

**Best Practice** – Put it in their terms

Showing how the results can be used can help the commissioner better understand the results of the study.

*For R&D – highlight the opportunity!*

- 3% of GWP: Extraction
- 6% of GWP: Processing
- 89% of GWP: Use
- 2% of GWP: End of Life

**The R&D innovation opportunity!**

*For Marketing – illustrate a claim!*

**ECO-SCOPES**: Now made with 25% fewer GHG emissions!

*A completely fictitious example for illustrative purposes only.*

LCA X – Portland – 4 November 2010
KEY TAKEAWAY?

Average Carbon Footprint of Carpet
Cradle to Gate vs. Full Life Cycle

- Impact of renewable energy use
  - Raw Materials: 6.50 kg CO₂e/m²
  - Mfg Energy: 0.20 kg CO₂e/m²
  - Support: 0.15 kg CO₂e/m²
  - Transport & Install: 0.35 kg CO₂e/m²
  - Use: 3.12 kg CO₂e/m²
  - Disposal: 0.27 kg CO₂e/m²

- Cradle to Gate: 6.7 kg / 14.8 lb
- Full Life Cycle: 10.6 kg / 23.3 lb
  (Cool Carpet value per GHG Protocol)

Support - includes carbon emissions from energy used at leased facilities (showrooms, offices, etc.)
Use - includes carbon emissions from energy used for customer maintenance (7 years average life)
EXAMPLE product option is favorable across all impact categories. We will use GHG emissions as a representative impact...

100% = Product with the highest impact in that category.
EXAMPLE - SYSTEM BOUNDARY IN TERMS OF LCA PHASES
Understand data gaps and where uncertainty exists

Vehicle Life Cycle & Fuel Economy Regulations

PRODUCTION PHASE
- Primary production of material
- Secondary production of material
- Material finishing
- Vehicle assembly
- Production of battery, fuel cell, tires and fluids

USE PHASE
- Vehicle use
- Fuel production

EOL PHASE
- Battery recycling
- Vehicle end-of-life
- End-of-life scrap
- Scrap input

Scrap inputs to & outputs from vehicle life cycle

Covered by EPA/NHTSA regulations
Explanation of chart and material options here

Impact intensity of example material is ~290X higher than example material choice.

Explanation of chart and material options here
Single attributes such as “bio-based” doesn’t always mean it’s more sustainable. We can’t just rely on marketing info.

Specific explanation here
Perception vs. Reality (bio-based vs. fossil)

Eco-efficiency supports sound decision making

Bio-based materials may not be “Green”.

Analysis beats Greenwashing!

Analysis supports informed decision making!

Eco-efficiency portfolio comparing a wide range of applications utilizing bio-based materials
Sustainability Communications - Avoid the Sins of Greenwashing

- Sin of the Hidden Trade-Off
- Sin of Vagueness
- Sin of No Proof
- Sin of Worshiping False Labels
- Sin of Lesser of Two Evils
- Sin of Fibbing
- Sin of Irrelevance
What has been successful:

- Customize the message to your audience! What types of media work best?
  - Webpage, poster, webinar, video, graphic, text/chart etc.
  - Be Concise. What does it tell them. Why is it relevant. How can they use it.

What has NOT been successful:

- Sharing every LCA results from the report
- Highly technical discussions

Examples on following slides:
Did you know?
Using SOKALAN may prevent, per year, the emission of...

12 kg Carbon to the atmosphere
1 trip Sao Paulo to Santos Roundtrip, family car

Water volume saved
1100 l
Equivalent to the daily consumption of
5 people

180 Flushes the toilet
down
100 Dishwasher cycles
Effect of SOKALAN HP 56, in a house with 4 people

-20% Environmental Impact

Reduces the amount of water used
Reduces the amount of wastewater treated

Most Relevant Environmental Impact Categories

- Climate Change
- Water Depletion
- Freshwater Eutrophication
- Acid Rain

Impact through the value chain

10% Manufacturing of detergent and softener
46% Use Phase Water and Electricity
44% Wastewater treatment

80% of the total environmental impact
Communication of LCA results to organizational influencers
Marketing Groups

- What has been successful:
  - Customize the message to your audience! What types of media work best?
  - Sharing information that can help tell a compelling story
    - Webpage, poster, webinar, video, graphic, text/chart etc.
    - Be Concise. What does it tell them. Why is it relevant. How can they use it.

- What has NOT been successful:
  - Sharing too much detail needed for decision making
  - Examples on following slides:
# Radio Flyer

**Additional Sustainability Info**

<table>
<thead>
<tr>
<th>LEED PLATINUM HQ</th>
<th>GREAT PLACE TO WORK</th>
<th>BUILDING PLAYGROUNDS</th>
<th>PLANTING TREES</th>
</tr>
</thead>
<tbody>
<tr>
<td>We were awarded the title in 2014 for features like geo-thermal heating.</td>
<td>We are constantly recognized for our great culture and benefits</td>
<td>We have built 8 Playgrounds in partnership with Kaboom!</td>
<td>We work with the Arbor Day Foundation to plant a tree for each radioflyer.com purchase.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DONATIONS</th>
<th>BIG FLYER SPORT</th>
<th>BUILT TO LAST</th>
<th>SAFE MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over the past 10 years we have donated over 40,000 toys to children in need.</td>
<td>A new trike is PVC-free, made with low-impact materials and made in the USA!</td>
<td>From 2015-16 we shipped over 123,000 replacement parts to extend the life of our toys.</td>
<td>Our Sustainable Chemistry program restricts hazardous substances from our products.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOCIAL COMPLIANCE</th>
<th>LANDFILL FREE HQ</th>
<th>VMV</th>
<th>PRODUCT SCORECARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 99% of overseas products ship from factories with ICP Seals of Compliance.</td>
<td>We are striving to be a zero-landfill HQ; today 99% of waste at HQ is recycled.</td>
<td>Our Vision, Mission and Values guide everything we do at Radio Flyer.</td>
<td>A tool to help reach our Sustainability Criteria goal.</td>
</tr>
</tbody>
</table>
Pluracol® Balance (PM) – polyols for flexible foams

Renewable feedstock vs. fossil based feedstock

Effective results communication using environmental equivalencies
SUSTAINABILITY TRAINING
SUMMARY

What has been successful:
- Customize the message to your audience! What types of media work best?
  - Webpage, poster, webinar, lunch & learn, video, graphic, text/chart etc.
  - Show examples of EPDs and try to include how that specific EPD helped your company
- Define LCA, EPD, and PCR and expand on... How they are linked? What is their value?
- What is the expected timeline to complete?
  - Life Cycle Assessment: the process/methodology
  - Environmental Product Declaration: output or outcome of LCA
  - Product Category Rule: starting point, framework & rules (typically developed by industry)
- Briefly reviews the various types of impacts that can be studied

What has NOT been successful:
- Technical jargon & acronyms

Examples on following slides:
Guidelines for Providing Product Sustainability Information – Link to PDF

Global guidance on making effective environmental, social and economic claims, to empower and enable consumer choice.
Sustainability Communications
Guidelines for Providing Product Sustainability Information

FUNDAMENTAL PRINCIPLES

RELIABILITY
Build your claims on a reliable basis
- Accurate and scientifically true
- Robust and consistent
- Substantiated data and assumptions

CLARITY
Make the information useful for the consumer
- Exclusive and direct link between claim and product
- Explicit and easy to understand
- Limits of claim clearly stated

RELEVANCE
Talk about major improvements, in areas that matter
- Significant aspects ‘hotspots’ covered
- Not masking poor product performance, no burden shifting
- Genuine benefit which goes beyond legal compliance

UN environment

BASF
We create chemistry
FUNDAMENTAL PRINCIPLES

TRANSPARENCY
Satisfy the consumer’s appetite for information, and do not hide

- Developer of the claim and provider of evidence published
- Traceability and generation of claim (methods, sources, etc.) published
- Confidential information open to competent bodies

ACCESSIBILITY
Let the information get to the consumer, not the other way around

- Clearly visible: claim easily found
- Readily accessible: claim close to the product, and at required time and location
LCA OVERVIEW

Inputs
- Raw materials
- Energy
- Water

Outputs
- Products
- Emissions
- Waste
<MAIN TAKEAWAY/PRO-TIP>

The world produces more than 400 million tons of plastics every year. The largest industrial sector is plastic packaging. Single-use material designed for immediate disposal.

**Packaging** 36%

**Textiles** 14%

**Consumer and institutional products** 10%

**Building and construction** 16%

**Transportation** 7%

**Industrial machinery** 1%

**Others** 12%

Source: Adapted from Geyer, Jambeck, and Law, 2017

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**7 SINGLE-USE SWAPS AND THE TRASH YOU CAN SAVE IN ONE YEAR**

1 bamboo toothbrush = 4 plastic toothbrushes
1 glass floss container = 7 plastic floss containers
1 reusable water bottle = 167 plastic water bottles
1 reusable bag = 170 plastic bags
1 reusable cup = 500 coffee cups
1 metal straw = 540 plastic straws
1 cloth towel = 7,300 paper towels

"The people who make the biggest difference are the ones who do the little things consistently."
WHAT IS NEEDED FOR AN EPD?

PCR
Product Category Rules

LCA
Life Cycle Assessment

EPD
Environmental Product Declaration
**IS LCA VALUABLE, HOW CAN IT HELP MY BUSINESS?**

**Why Invest in LCA?**

- **To respond to our customers demands**
  - Construction projects under building schemes (LEED, BREEAM, Green Globes...)
- **To market SG Products**
  - Support company sustainability philosophy
- **Push transparency**
  - Assess producer responsibility
- **To assess and reduce our environmental impacts**
  - Including unfamiliar impacts we don’t normally see or consider
- **Set impacts in context**
  - Relative to each other and relative to each life cycle state
- **Be the “pioneer” on the market**
- **Compare with industry or competitors**
  - Strict rules apply for external comparisons

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**Questions that can be answered by LCA?**

- **Does this product have less impact than others?**
- **Eco-design**
- **Marketing**
  - Which product has the least impact?
- **Purchasing**
  - Year-to-year tracking
- **Benchmarking**
  - (across a sector or internal)
- **Can my product accomplish the same goals with lower environmental impact?**
- **Eco-innovation**
  - Can we fundamentally / radically alter our product and its impact?

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**Building environmental labels**

<table>
<thead>
<tr>
<th>Building environmental labels</th>
<th>LCA requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Globes</td>
<td>Performance approach evaluation</td>
</tr>
<tr>
<td>LEED</td>
<td>As a bonus in LEED 3.05 criteria “Innovation and Design” and as a criteria in LEED v4 version.</td>
</tr>
<tr>
<td>BREEAM</td>
<td>In criteria B1, B2, B4 and B4 of “Materials”</td>
</tr>
</tbody>
</table>
SUSTAINABILITY EXPERTS
SUMMARY

What has been successful:

- Provide high-level overview of LCA, if not familiar, emphasizing the following:
  - LCA is not a new method (first LCA conducted in the late ‘60s!)
  - It is governed by ISO standards that address data quality requirements, critical review, etc.
  - It allows for holistic assessment of impacts and evaluation of trade-offs/burden shifting between life cycle stages
- Discuss results in clear and concise manner
  - Use charts/graphs when possible
  - Provide simple description of LCI A impact categories
- Explain important sensitivity and scenario analyses
- Address inherent limitations of LCA and any significant study limitations or data gaps

What has NOT been successful:

- Overstate the precision or accuracy of the results
- Provide more detail than necessary, even though the audience may be familiar with technical sustainability topics
- Tout LCA as the only method for sustainability assessments, but instead note that it compliments other approaches sustainability experts may already be familiar with
EXTERNAL CUSTOMERS/INVESTORS
What has been successful:
- Customize the message to your audience! What types of media work best?
  - Webpage, poster, webinar, video, graphic, text/chart etc.
- Keep it simple. Apply to a real world situation. Leave with an easy takeaway
- Comparative LCA results are the strongest
- Relate to customers point of view
- Consider what the customer values beyond sustainability?

What has NOT been successful:
- Highly technical results that aren’t in placed in a customer context.
- Displaying every LCA result from the LCA report

Examples on following slides:
Cloth vs. Paper Napkins
Study by Georgia Pacific
How do Full Service Restaurant napkins impact the environment? The results may surprise you.

Dixie Ultra® Linen Replacement Napkins have certain environmental advantages over Polyester Reusable restaurant napkins, according to a recent study. The ISO 14040/14044 compliant study completed by GP PRO considered disposable and reusable napkins over the entire useful life of the napkins. The study findings were critiqued and validated by the Athena Institute, a global expert in sustainability.

The environmental impact of these napkins is annually equivalent¹ to:

<table>
<thead>
<tr>
<th>Environmental Impact</th>
<th>Dixie Ultra® Linen Replacement Napkin</th>
<th>Polyester Reusable Napkin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide emissions from...</td>
<td>3,200 miles driven by average passenger car</td>
<td>5,300 miles driven by average passenger car</td>
</tr>
<tr>
<td>Energy of brewing...</td>
<td>4,000 Cups of coffee</td>
<td>8,600 Cups of coffee</td>
</tr>
</tbody>
</table>

Environmental impacts categories assessed:
- Global Warming Potential
- Ozone Depletion Potential
- Photochemical Ozone Creation Potential
- Eutrophication Potential
- Acidification Potential
- Primary Energy Demand
- Net Freshwater Consumption

Full study findings available upon request. To learn more about GP PRO’s full line of napkins, visit www.gppro.com/products/napkins. And for more information on GP PRO’s commitment to sustainability, visit www.gppro.com/sustainability.

gpcom
1-866-HELLO GP (435-5647)

¹ Assuming US meal occasions per day and open 70 days per year for average restaurant. Based on information from https://www.epa.gov/energy/how-much-energy-do-i-consume-an-average-american.

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Dos & Don’ts

Table 4: Example for explicit and easy to understand information

<table>
<thead>
<tr>
<th>Product: Box of Chocolates</th>
<th>Do (company A)</th>
<th>Don’t (company B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claim</td>
<td>Concise visual information, complemented by simple text, helps the consumer to understand not only if the product packaging is recyclable but also whether it can be recycled based on the availability of recycling infrastructure. Guidance is further provided for individual packaging components, in this case also different types of plastics used for the inner tray and film. It is also clear to the consumer what his/her role is, i.e. to recycle. Further information on the label <a href="http://www.OPRL.org.uk">www.OPRL.org.uk</a></td>
<td>While the Mobius loop is an internationally recognised symbol for recycling, its use without text assumes that all consumers understand its meaning; and/or that all of the product's material can be recycled. It also only shows that the packaging is recyclable but not that this recycling is actually available via local infrastructure. If wanting to comply with the international standard ISO 14021 (ISO 2016a) a qualified claim must adequately convey the limited availability of collection facilities.</td>
</tr>
</tbody>
</table>

Discussion

Table 1: Example of accuracy and robustness

<table>
<thead>
<tr>
<th>Product: T-Shirt</th>
<th>Do (company A)</th>
<th>Don’t (company B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claim and applied method</td>
<td>“Our T-Shirts are organic”</td>
<td>“Our T-Shirts are organic”</td>
</tr>
<tr>
<td>Method: GOTS Version 5.0</td>
<td>Method: [Hypothetical] RTS Standard</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

Company A has participated in the GOTS certification scheme. The GOTS standard is an accepted methodology to guarantee a minimum content of organic fibre (+95%), the exclusion of hazardous substances in garments sold as organic, plus social requirements. Compliance is based on annual independent inspections at production sites.

Revision processes of the standard are based on a collaborative approach and include participation of relevant stakeholders (e.g. Ecological and Toxicological Association of Dyes and Organic Pigments, Social Accountability International, International or Clean Clothes Campaign). GOTS criteria cover the entire supply chain from fibre to end product.

Company B bases its claim on its own (hypothetical) labelling standard. It would need independent assurance or endorsement by a scientific institution or government that the methodology is robust, e.g. to ensure that the T-Shirt is made from organic cotton and that there is sufficient evidence to back up this claim. Without sufficient transparency/documentation on the supply chain and production processes the claim cannot prove to be accurate.
Save up to 20% of water and energy when doing the laundry!
The Life Cycle of a Plastic Bag [Infographic]

1. **Birth**
   - Plastic bags begin their lives as crude oil. The crude oil is heated until it produces ethylene gas, and then converted to polyethylene that is forced through holes to make plastic. The string is cut, stretched and dyed, becoming a plastic bag. The bag is then imprinted with a company’s logo and off it goes to your favorite store.

2. **Life Span**
   - Whether used to carry groceries or office supplies, most plastic bags are used only once for an average of 12 minutes before being recycled or thrown away.

3. **Intermission**
   - Plastic bags that aren’t recycled end up in landfills or the oceans. Scientists estimate it can take up to 1,000 years for a plastic bag to disintegrate completely, releasing toxins and damaging the environment as they decay. In addition, each year more than a million sea birds and 100,000 marine mammals including whales, dolphins and seals are killed because of plastic bags.

4. **The Next 1,000 Years**
   - Because consumers receive so many plastic bags and recycling it takes 6 times more energy than creating it, more than 98% of plastic bags are discarded instead of recycled.

**Main Takeaway/Pro-Tip**

- Americans throw away about 100 billion plastic bags a year, that is equivalent to dumping nearly 12 million barrels of oil.
Although you may only use a plastic bag for about 20 minutes, its lifespan is much longer than that. In fact, it could sit in a landfill for 1,000 years – that is, if, by then, it hasn’t been picked up by animals, potentially eaten and posing a more significant threat to their health.
BASF – Concrete EPD
Infographic video
Communication of LCA results to organizational influencers

External Customers/Investors - EXAMPLE

Take the 3M™ Petrifilm™ Plate Sustainability Challenge

Are you still using agar dishes for microbial indicator testing? If so, you’re missing a big opportunity to not only boost your lab’s productivity and accuracy, but also help meet your company’s sustainability goals. 3M™ Petrifilm™ Plates can reduce your environmental impact over using agar plates in four key areas:

- **Water** savings: 79%
- **Waste** reduction: 66%
- **GHG emissions** decrease: 75%
- **Energy** conservation: 76%

**Saving** 54,600.0 liters of water

Reducing solid waste by **1,560.0 kg**

Eliminating the CO₂ emissions from one typical passenger vehicle driving **42,120.0 kilometers**

Conserving enough energy to power **807,040.0 60W light bulbs for one hour**
CircuitBac Green
Carpet backing based on bio-plastics

A more sustainable alternative
CircuitBac Green is a high-performing backing with increased biobased and recycled content, which decreases the carbon footprint of the finished carpet tile.

A mix of natural materials
Natural oils and resins are used as a carbon-negative alternative to current backing materials.

Mineral filler
Recycled limestone is used as an inert filler.
Workgroup #1 – Communication of LCA results to organizational influencers

- Participants
  - Jana Fogarty- Kohler (co-leader)
  - Keith Lindemulder –Nucor (co-leader)
  - Carrie Pearson- 3M
  - Brandie Sebastian- AISI
  - Nagapooja Seeba - Whirlpool
  - Beth Ann Cano- Saint-Gobain
  - Mandy Montazeri- Kohler
  - Connie Hensler- Interface
  - Russ Balzer- Phoenix Group
  - Alison Conroy- Georgia-Pacific
  - Bruce Uhlman - BASF