

#4 Plastics

Subcommittee Meeting #4 Summary - Plastics January 25, 2022 9AM-12PM

Subcommittee Meeting #4 of the Plastics Subcommittee (#4-Plastics) was convened virtually via Zoom on January 25, 2022 from 9 AM -12 PM, CST. Attendance for #4-Plastics is provided in Table 1 below.

Table 1. #4-Plastics Subcommittee Membership and Attendance

Name	Company	Attended 1/25/22
Harlan Buxbaum	Dee Zee, Inc.	Present
Michele Boney	West Liberty Foods	Present
Troy Willard	Can Shed LLC/ Iowa Recycling Association	Present
Merry Rankin	Iowa State University	Present
Julie Ketchum	Waste Management	Present
Mick Barry	Mid America Recycling	Present
Scott Vander Sluis	Van's Sanitation and Recycling	Present
Bryce Stalcup	Waste Commission of Scott County	Present
Jennifer Horner	That's Not Trash, LLC	Absent
Joe Bolick	Iowa Waste Reduction Center	Present
Sue Waters	Plastics Recycling of Iowa Falls, Inc.	Absent
Nicole Crain	Iowa Association of Business and Industry	Present
Halil Ceylan	Iowa State University	Present
Gabe Claypool	Des Moines Industrial	Present
Marcus Brandstad	ACC	Present
Samuel Sturtz	Iowa DOT	Present
Laurie Rasmus	DNR Internal SMM Team	Present
Amie Davidson	DNR Internal SMM Team	Absent
Tom Anderson	DNR Internal SMM Team	Present
Jennifer Wright	DNR Internal SMM Team	Present
Jennifer Reutzel Vaughn	DNR Internal SMM Team	Absent
Michelle Leonard	Consultant – SCS Engineers	Present
Christine Collier	Consultant – SCS Engineers	Present
Rosa Cruz	Consultant – SCS Engineers	Present
Ketan Shah	Consultant – SCS Engineers	Present
Karen Luken	Sub-Consultant – EESI*	Present

* Economic Environmental Solutions International

A. Subcommittee #4 - Plastics Summary

The meeting began with the project consulting team reviewing the agenda for this meeting (see Attachment A), the overall objectives of the Sustainable Materials Management (SMM) – Vision for Iowa project, the process and goals of the project process, and the goals for today's subcommittee meeting. The Stakeholder Meeting #3 schedule and Subcommittee responsibilities were also discussed. The slides presented for this Subcommittee meeting are included in Attachment B.

The project consulting team presented a series of slides from an LCA performed for single use water bottles prepared by SCS Engineers. A baseline scenario was modeled to understand the environmental impact of each impact category. Impacts included global warming potential, ozone depletion, human health, eutrophication etc.

The parameters selected for the model were:

- Percent of plastic content of bottles
- Percent of plastic resin incinerated
- Percent of rigid plastics landfilled
- Percent of water bottles reused
- Process parameter

The percentages used to create a baseline model were:

- Recycled content = 0%
- Plastic resin incinerated = 20%
- Rigid plastics landfilled = 80%
- Water bottles reused = 30%
- Process parameter = Water loss is considered

Global warming potential was analyzed from the modeled results. The results concluded that 42% of the global warming potential came from PET bottle converting and another 40% was from the poly propylene cap resulting in about 80% of the global warming potential coming from the manufacturing of single use plastic water bottles.

Following the presentation of the model the consulting team discussed what scenarios could be run to model potential legislation or programs that could be implemented in Iowa to reduce the environmental impacts of plastic water bottles. Subcommittee members expressed that they would like to see a baseline model that is more representative of Iowa and offered suggestions to improve the model.

Subcommittee suggestions and recommendations for Iowa base model:

Recycled content

- The baseline for recycled content can be increased from 0% to 7% to represent the national average to create a more realistic baseline.
- Find data that would make the baseline more specific to Iowa.
 - Ask MRFs in Iowa about end market information to get a better picture of what percent of water bottles are going back into the manufacturing of PET water bottles.

Rigid plastics landfilled

- Based from the 2017 waste characterization, plastic water bottles were not a large portion of the waste stream. Find data for percent of plastic PET water bottles that are being landfilled in Iowa.

Plastic Resin incinerated

- Lower the incineration percentage due to Iowa only having one incinerator

- Speak with Ames to find out what percentage of waste incinerated is plastic water bottles to get a more accurate number for an Iowa base model.

Water bottle reused

- Find data on the reuse of plastic water bottles that can give us a number for our base model instead of using an assumption.
- Can we encourage and educate on the reuse of water bottles to increase reuse as part of a scenario?

Additional subcommittee comments on modeling:

- Can electric vehicle (EV) transportation be incorporated into the model to decrease emissions?
- Model the difference between individual water bottles sold at a store vs a pack of water bottles. This will have a different process such as not being refrigerated.
- The Scott County MRF could run a small study to get data on what percent of PET is plastic water bottles that can be incorporated into getting more accurate data for the model.

Suggested Strategies for plastics:

Subcommittee Member Discussion:

- Look into new advanced recycling technologies that have the ability to recycle polystyrene and mixed plastics. How can we bring these technologies to Iowa?
 - Brightmark in Indiana has an advanced recycling facility that can recycle plastics 3, 4, 6 and 7 that are hard to find end markets. It is a commercial scale facility that when fully operational can process 100,000 tons of plastic. These plastics are pelletized, put in a chamber, gasified and turned into a liquid that resembles crude oil. These recycled plastics have been used to make cups that are 50% recycled content.
 - There is a planned polystyrene recycling facility in Indiana. This facility will have technology to bring in post-consumer polystyrene, recycle it, and create a new virgin like product to be used in new polystyrene products.

B. Research Request List

Through the discussions, various topics were identified for further research. These are provided below.

- Research regional data for recycled content in plastic water bottles.
- What is the end life of plastic water bottles when they are being recycled? Are they made into water bottles or something else?
- 924 tons of PET went through the Scott County MRF in 2021, find out what percentage of PET is water bottles.
- Find national data on reuse of plastic water bottles.

C. Other Notes

Other items of note from the #4 - Plastics meeting are as follows:

- The third Stakeholder Meeting will be held May 23, 2022. Subcommittee members in addition to other interested parties are invited and encouraged to attend. There are two planned meetings in March and April before the stakeholder meeting.

Attachments:

Attachment A: Agenda

Attachment B: PowerPoint Presentation

Attachment A
Agenda

Subcommittee Meeting #4 - Plastics

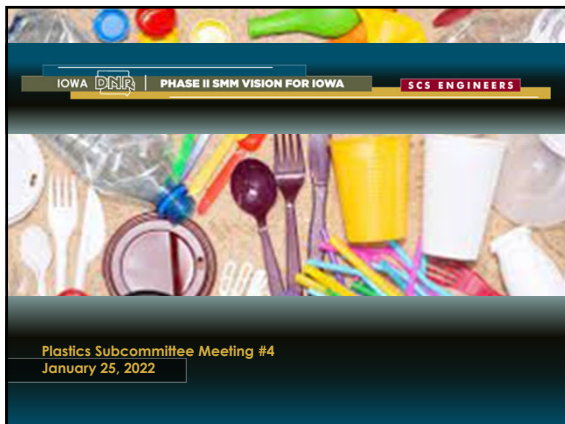
January 25, 2022

9:00AM – 12:00PM (CST)

Virtual Meeting

1. Lifecycle Analysis of Single Use Water Bottles
 - a. Study process
 - b. Study parameters
 - c. Baseline results
 - d. Baseline input discussion
2. Discussion/Selection of Modified Scenarios
3. Plastic Bags and Polystyrene Next Steps

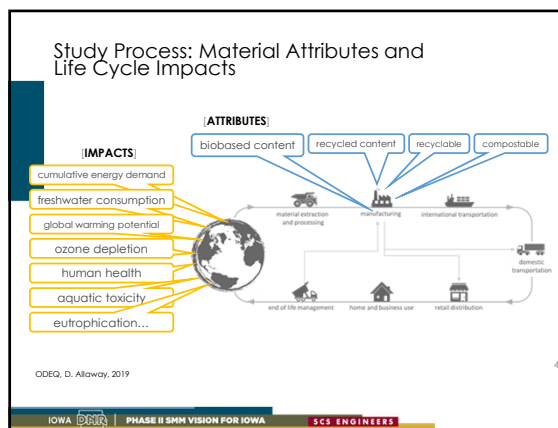
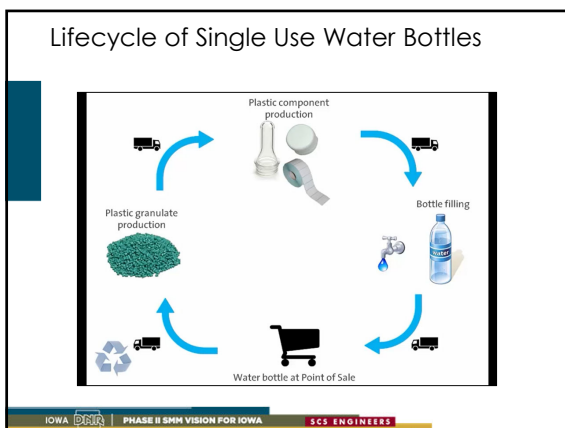
Attachment B
PowerPoint Presentation



Agenda

- Lifecycle Analysis of Single Use Water Bottles
 - Study process
 - Study parameters
 - Baseline results
 - Baseline input parameters discussion
- Discussion/Selection of Modified Scenarios
- Plastic Bags and Polystyrene Next Steps

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Study Process

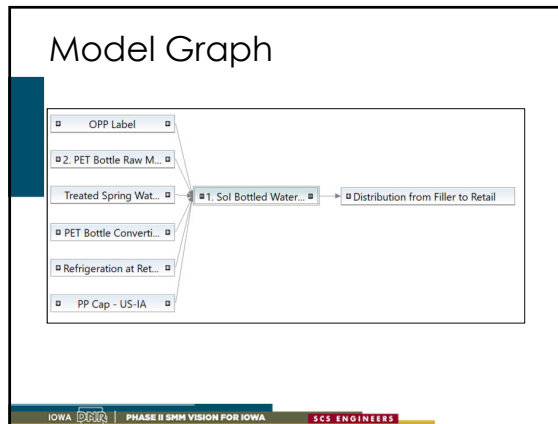
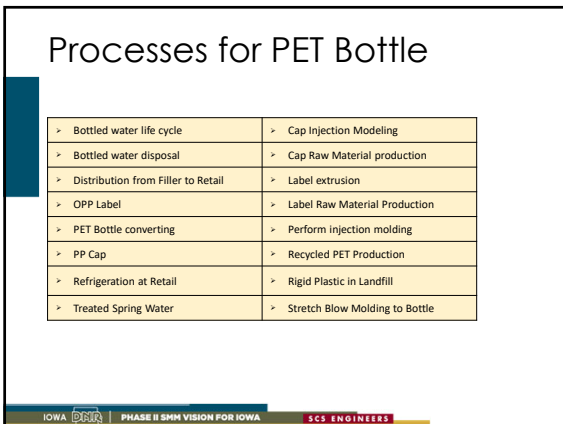
- Sourcing of upstream data: US Life cycle inventory (USLCI), hosted by the U.S. Federal LCA Commons
- Database selected: National Renewable Energy Laboratory/USLCI repository as JSON-LD
- Open LCA Location selected: State of Iowa for mapping.
- Created new processes and link to the existing product flows
- Established parameters
- Impact Assessment Method: TRACI v2.1
- Generated impact assessment results.

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Parameters selected

- Recycled content = 0% to 50% (selected 0%)
- Plastic resin incinerated = 0% to 20% (selected 20%)
- Rigid plastics in landfill = 80%
- Water bottle reused = 30%
- Process parameter = water loss is considered

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Baseline Results

Impact analysis: TRACI 2.1 (NETL mod)

Subgroup by processes Don't show < 1 %

Name	Impact result	Unit
Global warming	13.73666	kg CO2 eq
Estropication	0.00373	kg N eq
Human health - particulate matter	0.00195	PM 2.5 eq
Smog formation	15.87940	kg O3 eq
Human health - cancer	2.03468E-8	CTUcancer
Acidification	0.05083	kg SO2 eq
Freshwater ecotoxicity	1.10111	CTUeco
Human health - non-cancer	1.68894E-7	CTUoncancer
Ozone depletion	5.85371E-8	kg CFC-11 eq

Baseline Results Contribution Tree


Impact category: Global warming

Contribution	Process	Amount	Unit
100.00%	1. Sol Bottled Water Project - US-IA	13.73666	kg CO2 eq
> 42.85%	P PET Bottle Converting - US-IA	5.88567	kg CO2 eq
> 40.76%	PP Cap - US-IA	5.59838	kg CO2 eq
> 14.70%	P OPP Label	2.01912	kg CO2 eq
> 01.37%	P Refrigeration at Retail	0.18755	kg CO2 eq
> 00.33%	P 2. PET Bottle Raw Material Production	0.04594	kg CO2 eq


- ### Baseline Input Parameters Discussion...
- Recycled content = 0% to 50% (selected 0%)
 - Plastic resin incinerated = 0% to 20% (selected 20%)
 - Rigid plastics in landfill = 80%
 - Water bottle reused = 30%
 - Process parameter = water loss is considered

Discussion/Selection of Modified Scenarios

- Comparative LCA of scenarios, different permutations for single use water bottle parameter analysis.
- Plastic resin; major contributor to the carbon footprint.
 - Recycling; estimated 30 to 70 percent decrease in GHG emissions
- Other environmentally friendly alternatives includes:
 - Using less plastic for bottles.
 - Making a lighter bottle.
 - Reducing transportation distances, and
 - Other energy-intensive processes.



virgin PET



20-50% Recycled PET

Single Use Plastic Water Bottles (SUPWB)

Discussion...Next Steps:

Plastic Bags

Polystyrene

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Suggested Strategies & Timelines 0-3 Years

Legend:
 Upstream Measures (Pink)
 Consumer Actions (Blue)
 End of Life (Yellow)

- Upstream Measures:**
 - Design for recycling or composting
 - Data collection on post-consumer recycled content purchasing for government agencies
 - State define recyclable, compostable, biodegradable
- Consumer Actions:**
 - Develop reuse and refill pilots and funding
 - Encourage reuseables for dine-in
 - Education and awareness campaigns for refill, reuse, and repurpose
 - Data on volumes of bottle bill vs MRF for collection
 - Data on statewide (lowa) standards on labeling and recycling materials accepted - terminology consistent
 - Education and awareness campaign to reduce contamination in recycling programs
 - Research H&S codes on reusable containers
 - Encourage reuse/refill for take-out and delivery
 - Reuse of take-out containers for food distribution
 - Support research on plastics transformation into new product, fuel, etc.
 - Education and awareness on littering
 - Collection data on final destinations of materials / recycling facilities
- End of Life:**
 - Education and awareness campaign to reduce contamination in recycling programs
 - Collection data on final destinations of materials / recycling facilities

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Suggested Strategies & Timelines 4-10 Years

Legend:
 Upstream Measures (Pink)
 Consumer Actions (Blue)
 End of Life (Yellow)

- Upstream Measures:**
 - Eliminate problematic and unnecessary packaging
 - Reconsider Ban on Bans
 - Require post-consumer recycled content purchasing for government agencies
- Consumer Actions:**
 - Implement to-go container and cup charges
 - Standards for customer opt-in for food service packaging and accessories
 - Implement plastic bag fee
- End of Life:**
 - Add all non-carbonated containers to the Bottle Bill*
 - Add SUPB (water) to Bottle Bill*

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Suggested Strategies & Timelines 11+ Years

Legend:
 Upstream Measures (Pink)
 Consumer Actions (Blue)
 End of Life (Yellow)

- Upstream Measures:**
 - Local or statewide ban plastic bags
 - Local or statewide ban polystyrene containers
 - Require post-consumer recycled content for packaging
- Consumer Actions:**
 - Establish producer registry and reporting for packaging
 - Monitor EPR policy framework for packaging in other states
 - Consider/Adopt EPR policy framework for packaging
- End of Life:**
 - Evaluation of recycling methods throughout state
 - Support development and adoption of reusable packaging systems

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What's Next?

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