Summary Report

Stakeholder Meeting #1 – Summary Report

April 8, 2021 (Submittal Date)

Per our contract, the following is a summary report for the Stakeholder Meeting #1 held March 25, 2021.

A. Stakeholder Meeting #1 Summary and Recommendations

SCS Engineers (SCS) and Economic Environmental Solutions International (EESI) (collectively the SCS Project Team) coordinated and facilitated the Stakeholder Meeting #1 held March 25, 2021 from 9:00 AM – 12:00 PM (CST). This meeting was performed virtually via Zoom. The purpose of this meeting was to introduce the objectives of the Sustainable Materials Management (SMM) – Vision for Iowa Phase II (Phase II), review the results of Phase I completed in 2019, facilitate discussions with meeting participants to select material categories for further evaluation, and to introduce the next steps for continuation of Phase II.

Prior to this meeting, the SCS Project Team and the Iowa Department of Natural Resources (DNR) Land Quality Bureau staff worked to encourage meeting participation by identifying and contacting individuals that were either invited to participate in Phase I, individuals that work for companies or organizations that may be impacted by project outcomes, or individuals that may be interested in participating. The DNR published a digital article promoting the meeting and encouraging interested persons to register. SCS used this digital article to further promote the meeting using professional social media platforms.

Information for individuals that were invited to attend and participate in the meeting is located in Attachment A of this Summary Report. A total of 62 individuals registered to attend and a total of 60 individuals attended the virtual meeting. Information on individuals that registered and those that attended the meeting, as well as their polled responses from the three questions at the onset of the presentation, are located in Attachment B of this Summary Report.

Meeting materials were provided to registrants prior to the March 25th meeting. Materials provided are listed below and included in Attachment C of this Summary Report.

- Meeting Agenda
- White Paper: Iowa Waste Management Hierarchy – Intent and Limitations
- White Paper: What is Sustainable Materials Management
- Iowa Sustainable Materials Management Vision for Iowa Think-Tank Report August 2019
- Iowa Sustainable Materials Management Strategic Vision for Iowa report October 2019
- Life Cycle Analysis Information

The meeting began with an introduction of DNR staff and the SCS Project Team present in the meeting. After an introduction to project objectives for Phase II, review of Phase I project results, summary of the life cycle analysis (LCA) process, and a discussion of potential priority material categories, meeting participants were divided into three separate breakout rooms. In each breakout room, SCS Project Team staff facilitated a discussion with meeting participants concerning the prioritization of potential material categories that would then be considered for future evaluation in Phase II.

Breakout room participants were presented with nine potential material categories for prioritization consideration. These categories were as follows:

- Construction and Demolition (C&D)
- Durable Goods
- Fibers
- Glass
- Metal
- Organics
- Plastics
- Renewable Energy Equipment
- Universal Waste and Household Hazardous Materials (HHM)

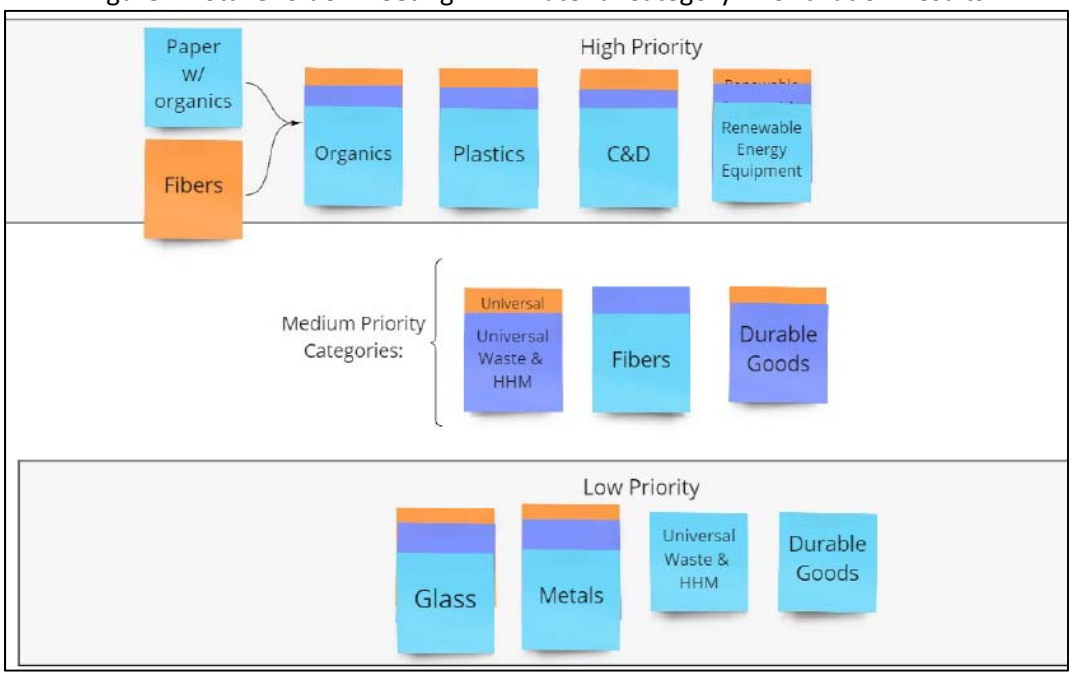
Prioritization of material categories within each group was not limited to a certain number of categories but was guided by the following general established guidelines:

- Materials within the Material Category were recommended in Phase I;
- Environmental benefits;
- Percent of Material Category in the existing waste stream (based on the 2017 Statewide Waste Characterization Study); and
- Feasibility for implementation.

Each breakout room selected their own material category priorities independent of the other breakout rooms.

Once the breakout rooms were complete, meeting participants were presented with a summary of the prioritized material category results. This larger group then discussed and selected which material categories should be considered as high, medium, or low priorities. The results of this discussion are presented in Figure 1 on the next page.

Figure 1 - Stakeholder Meeting #1 – Material Category Prioritization Results



The material category prioritization results from each breakout room are located in Attachment D of this Summary Report.

Meeting facilitators then discussed the next steps for Phase II, which includes establishing subcommittees. These subcommittees will perform further research for each of the prioritized material categories with the intent to select specific materials within that category for further evaluation. Based on the results of their findings, the subcommittees will then work to identify and recommend strategies that promote a sense of collective responsibility to prevent environmental degradation through waste reduction, reuse, and recycling for the selected material.

The presentation slides used for this meeting are included as Attachment E of this Summary Report. The recording of Stakeholder Meeting #1 (including all breakout rooms) will be made available on DVD and is considered Attachment F of this Summary Report.

B. Stakeholder Meeting #1 Materials & Data

- Attachment A – Contacts Invited to Attend Stakeholder Meeting #1
- Attachment B – Registration Information and Meeting Attendee Information
- Attachment C – Meeting Materials
- Attachment D – Material Category Prioritization Discussion Boards and Results
- Attachment E – Stakeholder Meeting #1 Presentation Slides
- Attachment F – Recoded Files of Meeting and Breakout Rooms

ATTACHMENT A

CONTACTS INVITED TO ATTEND STAKEHOLDER MEETING #1

Stakeholder Meeting #1 - Invite List with Active E-Mails

Industry Name	DNR Industry Type	Stakeholder Waste-System Categories	First	Last	Title	Email
1000 Friends of Iowa	Association	Non-Profit	Kari	Carney	Executive Director	kfoi@1000friendsofiowa.org
3M	Industry	Generator	Cory	Carr	Senior Environmental Engineer	ccarr@mmm.com
Adam Hammes	Solid Waste Consultant	Generator	Adam	Hammes	Kum and Go Manager of Social Responsibility	adamhammes@gmail.com
Additional Attendee	Additional Attendee	Additional Attendee	Additional Attendee	Additional Attendee		jphillips0177@outlook.com
Agribusiness of Association of Iowa	Private	Non-Profit	Joel	Brinkmeyer	Chief Executive Officer	jbrinkmeyer@agribiz.org
Agri-Industrial Plastics Company	Industry	Generator	Lori	Schaefer-Weaton	President	sales@aipcompany.com
AgriReNew (Sievers Family Farms)	Organics Processing	Processor	Bryan	Sievers	Manager	bryan.sievers@gmail.com
A-line Eds, Inc.	Industry	Processor	Benjamin	Stroh	President	ben@alineeds.com
Alliant	Industry	Utility	Jeffery	Hanson	Director of Sustainability	jeffreyhanson@alliantenergy.com
Alliant Energy	Utility	Utility	Jeff	Maxted		jeffreymaxted@aliantenergy.com
American Packaging Corporation	Manufacturing	Manufacturing	Jim	Withers		JWithers@AmericanPackaging.com
AMERIPEN	Association	Non-Profit	Susan	Robinson	Secretary for Ameripen Excecutive Committee	srobinson@wm.com
AMERIPEN	Association	Non-Profit	Susan	Robinson	Secretary for Ameripen Excecutive Committee	srobinson@wm.com
Area Education Agency	Primary and Secondary Schools	Non-Profit	Jon	Sheldahl	Chief Administrator	jsheldahl@heartlandaea.org
Arnold O. Chantland Resource Recovery System	Government	Final Management - Waste Conversion	Bill	Schmitt	Superintendent	rrp@city.ames.ia.us
At Large	Legislators/ Lobbyists	Consultant	Pat	Boddy		patriciaboddy@gmail.com
Big Ox Energy	Organics Processing	Final Management - Waste Conversion	Mike	Major	Director of Regulatory Compliance	mmajor@nlcenergy.com
Blackhawk County Landfill	Government	Final Management - Landfill	John	Foster		jfoster@wastetrac.org
Blank Park Zoo		Generator	X	X	X	info@blankparkzoo.com
Bridgestone	Industry	Generator	John	Poage	Energy Manager	poagejohn@firestoneag.com
Brown, Winick, Graves, Gross and Baskerville, P.L.C.	Legislators/ Lobbyists	Consultant	RG	Schwarm		rg.schwarm@brownwinick.com
Buena Vista Solid Waste Agency Transfer Station	Industry	Industry	Lori	Dicks		bvrecyclecenter@gmail.com
Cambrex	Industry	Industry	Jeff	Ross	EHS Director	jeff.ross@cambrex.com
Carroll County Landfill and Recycling Center	Solid Waste Agency	Processor	Mary	Wittry	Director	mwittry@carrollcountylandfill.com
Cedar Rapids - Linn County Solid Waste Agency	Solid Waste Agency	Final Management - Landfill	Karmin	McShane		kmcshane@solidwasteagency.org
Chamness Technology	Organics Processing	Processor	Gary	Chamness	Owner	gary@chamnesstechnology.com
City of Ames	Government	Government	Mark	Peebler		mark.peebler@cityofames.org
City of Cedar Rapids	Government	Government	Doyle	Smith		doyle.smith@cedarfalls.com
City of Des Moines Sustainability Coordinator	Government	Government	Jeremy	Caron	Program Manager	Sustainability@dmgov.org
City of Iowa City Landfill & Recycling Center	Government	Non-Profit	Jennifer	Jordan	Resource Management Superintendent	jennifer-jordan@iowa-city.org
City of Iowa City Landfill & Recycling Center	Government	Non-Profit	Jane	Wilch	Recycling Coordinator	jane-wilch@iowa-city.org
City of Sioux City	Government	Government	Mark	Simms	Public Works Director	msimms@sioux-city.org
CNH Industrial	Industry	Generator	Steven	Van Zant	Plant Manager	List on site but they are outside US
DMACC	Universities/Colleges	Generator	Melanie	Sadeghpour	Chair for the Environmental Sciences	mhsadeghpour@dmacc.edu
DSM Metro Waste Water Reclamation Authority	Government Related Agencies	Non-Profit	Paul	Ebert	Pre-Treatment Coordinator	pcebert@dmgov.org
Eat Greater Des Moines	Organics Recovery and Reduction	Non-Profit	Aubrey	Alvarez	Executive Director	aalvarez@eatgreaterdesmoines.org
Eco Innovation	Solid Waste Consultant	Consultant	Dave	Klockau		dklockau@msn.com
Economic Environmental Solutions International	Consultant	Consultant	Karen	Luken		KLuken@ecosolutions.co
EPA	Government	Government	Andrew	Wayne		wynne.andrew@epa.gov
Evora Group	Solid Waste Consultants	Consultant	Chris	O'Brien	COO	cobrien@evora-group.com
Food Rescue Partnership	Organics Recovery and Reduction	Non-Profit	Pete	Vogel	Chair	pete.vogel@foodrescueqc.org
Foth	Consultant	Consultant	Lea	Hensel		lea.hensel@foth.com
Foth	Solid Waste Consultants	Consultant	Kate	Bartlet		kate.bartelt@foth.com
Friends of Iowa			Kari	Carney		kari@1000friendsofiowa.org
Frontier Co-Op	Commercial / Retail	Generator	Alicia	Simmons	Sustainabilty Manager	Alicia.Simmons@frontiercoop.com
Golden Grain Energy	Industry	End User (Feedstock/Manufacturing)	Heidi	Marquardt	Environmental Manager	hmarquardt@ggecom.com
Green RU	Organics Recovery and Reduction	Transporter	Scott	Amendt	Territory Sales Executive	samendt@greenru.com
Grow: Johnson County	Organics Recovery and Reduction	Non-Profit	Scott	Koepke	Education Leader	gardenshealpeople@gmail.com
Habitat for Humanity of Iowa	Non-Profit (non-food related)	Non-Profit	Lisa	Houser	Executive Director	lhouser@iowahabitat.org
Hormel Corporation	Organics Retailers/Distributors/ Manufacturing	Generator	Tom	Raymond	Director of Environmental Sustainability	teraymond@hormel.com
Hy-Vee	Organics Retailers/Distributors/ Manufacturing	Generator	Mike	Smith	VP Real Estate and Sustainability	msmith@hy-vee.com
INRCOG	Government Related Agencies	Non-Profit	Kevin	Blanshin	Executive Director	kblanshan@inrcog.org
International Paper	Industry	Processor	Julie	Alsup	Manager, Government Relations Transportation, Postal, Paper, Recycling & Workforce	julie.alsup@ipaper.com
Iowa Assoc. of Business and Industry	Association	Non-Profit	Mike	Ralston	President	mralston@iowaabi.org
Iowa Compost Council	Association	Non-Profit	Jennifer	Trent	Director	jennifer.trent@uni.edu
Iowa Department of Natural Resources	Government	Government	Tom	Anderson		tom.anderson@dnr.iowa.gov
Iowa Department of Natural Resources	Government	Government	Reid	Bermel		reid.bermel@dnr.iowa.gov
Iowa Department of Natural Resources	Government	Government	Amie	Davidson		amie.davidson@dnr.iowa.gov
Iowa Department of Natural Resources	Government	Government	Jeff	Fiagle		jeff.fiagle@dnr.iowa.gov
Iowa Department of Natural Resources	Government	Government	Laurie	Rasmus		laurie.rasmus@dnr.iowa.gov
Iowa Department of Natural Resources	Government	Government	Jennifer	Reutzel		jennifer.reutzel@dnr.iowa.gov
Iowa Department of Natural Resources	Government	Government	Theresa	Stiner		theresa.stiner@dnr.iowa.gov
Iowa Department of Natural Resources	Government	Government	Michael	Sullivan		michael.sullivan@dnr.iowa.gov
Iowa Department of Natural Resources	Government	Government	Amy	Wilken		amy.wilken@dnr.iowa.gov
Iowa Department of Natural Resources	Government	Government	Jennifer	Wright		jennifer.wright@dnr.iowa.gov
Iowa Economic Development Authority (IEDA)	Government Related Agencies	Non-Profit	Jeff	Geerts	Special Projects Manager	jeff.geerts@iowaeda.com
Iowa Economic Development Authority (IEDA)	Government Related Agencies	Non-Profit	Jeff	Geerts	Special Projects Manager	jeff.geerts@iowaeda.com
Iowa Economic Development Authority (IEDA)	Government Related Agencies	Non-Profit	Shelly	Peterson		shelly.peterson@iowaeda.com
Iowa Environmental Council	Non-Profit (non-food related)	Non-Profit	Sarah	Lohmeier	President	iecmail@iaenvironment.org
Iowa Farm Bureau	Association	Non-Profit	Chris	Gruenhagen	Government Relations Counsel	cgruenhagen@ifbf
Iowa Grocery Industry Association	Association	Non-Profit	Michelle	Hurd	President	mhurd@iowagrocers.com
Iowa Hospital Association	Association	Non-Profit	Kirk	Norris	President & CEO	norrisk@ihaonline.org
Iowa House Environmental Protection Committee	Legislators/ Lobbyists	Regulator	Dean	Fisher	Chair	dean.fisher@legis.iowa.gov
Iowa League of Cities	Association	Non-Profit	Alan	Kemp	Executive Director	mailbox@iowaleague.org
Iowa League of Cities	Association	Non-Profit	Robert	Palmer		robertpalmer@iowaleague.org
Iowa Recycling Association (IRA)	Association	Non-Profit	Alan	Schumacher	President	Aschumacher@quincyrecycle.com
Iowa Renewable Energy Association	Association	Non-Profit	Tamera	Rae	Point of Contact	info@irenew.org
Iowa Restaurant Association	Association	Non-Profit	Jessica	Dunker	President	jdunker@restaurantiowa.com
Iowa Society of Solid Waste Operations (ISOSWO)	Association	Non-Profit	Bill	Rowland	President	bill@landfillnorthiowa.org
Iowa State Association of Counties	Association	Non-Profit	Carla	Becker	President	treasurer@dbqco.org
Iowa State Fair		Generator	Scott	Worth	X	scottworth@iowastatefair.org
Iowa State University	Universities/Colleges	Generator	Ayodeji	Oluwalana	Recycling Coordinator	aoluwala@iastate.edu
Iowa State University	Universities/Colleges	Generator	Merry	Rankin	Sustainability Director	mrankin@iastate.edu
Iowa Sustainable Business Forum West Liberty Foods	Association	Non-Profit	Michelle	Boney	President	michele.boney@wlfoods.com
Iowa Waste Exchange	Government Related Agencies	Non-Profit	Julie	Plummer		julie.plummer@wastecom.com
Iowa Waste Exchange (IWE)	Government Related Agencies	Non-Profit	Shelly	Codner	IWE Rep	shelly@netins.net
Iowa Waste Reduction Center	Universities/Colleges	Non-Profit	Joe	Bolick	Director	mibolick@uni.edu
Iowa Wholesale Beer Distributors Association	Association	Non-Profit	David	Adelman	Executive Director	dadelman@cgagroup.com
ISU Extension Office	University	Non-Profit	Shelly	Smith	Black Hawk County Executive Director	shellys@iastate.edu
J. Pettiecord, Inc.	Industry	Processor	Chad	Martin	Environmental Coordinator	chad@jpettiecord.com
JBS	Industry	Generator	Charles	Heisel	Environmental Manager	charles.heisel@jbssa.com
JEDA Polymers, LLC	Industry	Generator	Ronda	Haskell	Co-Owner	ronda@jedapolymers.com
Jendro Sanitation	Waste Management /Recycling and MRFs	Transporter	Alan	Powell	President	jendrosanitation@gmail.com
John Deere Des Moines Works	Industry	Generator	Tom	Noble	Environmental Manager	noblethomash@johndeere.com

Stakeholder Meeting #1 - Invite List with Active E-Mails

Industry Name	DNR Industry Type	Stakeholder Waste-System Categories	First	Last	Title	Email
Johnson County	Government	Government	Becky	Soglin		bsoglin@johnsoncountyiowa.gov
JWR, Inc.	Industry	Generator	Amber	Borchardt	Director of Marketing and Sales	amber@jwrinc.net
Keep Iowa Beautiful	Non-Profit (non-food related)	Non-Profit	Gerry	Schnepf	Director	gschnepf@keepiowabeautiful.com
Kemin Industries	Private		Heather	Christensen	Sustainability Coordinator	Heather.Christensen@meredith.com
Kum & Go	Commercial/Retail	Generator	Meg	Kayko	Sustainability Manager	meg.kayko@kumandgo.com
Luther College	Universities/Colleges	Generator	Jon	Jensen	Director, Center for Sustainable Communities	jensjo01@luther.edu
Master Builders of Iowa	Association	Non-Profit	Chad	Kleppe	President & CEO	ckleppe@mbionline.com
MEANSdatabase	Organics Recovery and Reduction	Non-Profit	Rose Maria	Belding	Executive Director	maria.rose@meansdatabase.org
Metro Waste Authority	Solid Waste Agency	Final Management - Landfill	Michael	McCoy	Executive Director	mmc@mwatoday.com
Mid America Recycling	Waste Management /Recycling and MRFs	Processor	David	Mueller		davidm@midamericanecycling.com
Mid American Energy	Industry	Utility	Danielle	Leslie		dleslie@midamerican.com
MidAmerica Recycling	Waste Management /Recycling and MRFs	Processor	Mick	Barry	President - Owner	mbarry@dwx.com
Midland Davis	Industry	Generator	Eric	Davis	Business Development Manager	eric.davis@midlanddavis.com
Midwest Electronic Recovery	Waste Management /Recycling and MRFs	Processor	Dave	Long	Owner	David@mcbia.com
Midwest Sanitation	Waste Management /Recycling and MRFs	Processor	Lyle	Vander Meiden	President	info@midwestsanitation.com
National Stewardship Action Council	Non-Profit (non-food related)	Non-Profit	Heidi	Sanborn	Executive Director	Heidi@nsaction.us
PDI	Organics Retailers/Distributors/ Manufacturing	Transporter	Joe	Harms	PDI Environmental Facilities Manager	joe.harms@pdisrd.com
Peoples Bank	Industry	Generator	John	Rigler III	President and COO	jprigler@mypeoples.bank
Pinnacle Foods	Industry	Generator	Clint	Huebner	Sr. Facility Specialist	clint.huebner@pinnaclefoods.com
Product Stewardship Institute	Non-Profit (non-food related)	Non-Profit	Scott	Cassel	Director	scott@productstewardship.us
Product Stewardship Institute	Non-Profit (non-food related)	Non-Profit	Sydney	Harris		sydneyh@productstewardship.us
Public	Public	Publuc	Jack	Stinogel		stino003@umn.edu
Push Resource Recovery	Industry	Generator	Jeff	Holmes	President	jeffh0701@gmail.com
Quaker Oats	Industry	Generator	Mark	Weldon		Mark.Weldon@pepsico.com
Quincy Recycle Paper	Industry	Processor	Chad	Crawford	General Manager	ccrawford@quincyrecycle.com
Recycle Me Iowa	Waste Management /Recycling and MRFs	Processor	Ciji	Mitrisin	Owner	ciji@recyclemeiowa.com
Region XII Council of Governments	Government Related Agencies	Non-Profit	Rick	Hunsaker	Director	rhunsaker@region12cog.org
Republic Services	Waste Management /Recycling and MRFs	Transporter	Kyle	Wehner		kwehner@republicservices.com
Repurposed Materials	X	X	Damon	Carson	President	damon@repurposedmaterialsinc.com
Ripple Glass	Industry	Processor	Justin	Miller	Plant Manager	justin@rippleglass.com
SCS	Solid Waste Consultants	Consultant	Michelle	Leonard	Vice President/Project Director	mleonard@scsengineers.com
SCS Engineers	Consultant	Consultant	Christine	Collier		ccollier@scsengineers.com
SCS Engineers	Consultant	Consultant	Michael	Miller		mmiller@scsengineers.com
SCS Engineers	Consultant	Consultant	Jeff	Phillips		jdphillips@scsengineers.com
SCS Engineers	Consultant	Consultant	April	Thompson		althompson@scsengineers.com
SCS Engineers	Consultant	Consultant	Anastasia	Welch		awelch@scsengineers.com
SE Polk School District	Primary and Secondary Schools	Non-Profit	Amy	Ahern	Director of Food and Nutrition	amy.ahearn@southeastpolk.org
Shockwave	Schockwave	Generator	Joe	Fitzgerald	Owner	joe@sw-companies.com
Sierra Club, Iowa Chapter	Non-Profit (non-food related)	Non-Profit	Carolyn	Raffensperger	Chairperson	raffenspergerc@cs.com
South Central Iowa Solid Waste Agency	Government	Final Management - Landfill	Rick	Hurt		rhurt@sciswa.org
St. Luke's Methodist Hospital	Industry	Generator	Susan	Woods		susan.woods@unitypoint.org
Technology Association of Iowa		Non-Profit	Brian	Waller	President	brian.waller@technologyiowa.org
Terracon	Consultant	Consultant	Anita	Maher-Lewis		anita.maher-lewis@terracon.com
The Can Shed	Waste Management /Recycling and MRFs	Processor	Troy	Willard	Owner	troyw@canshed.com
The Capitol Group (ISOSWO Lobbyist)	Legislators/ Lobbyists	Non-Profit	Jim	Obradovich	President and Lobbyist	obradovich.jim@gmail.com
The Compost Ninja	Organics Recovery and Reduction	Transporter	Aaron	Hanson	Owner	info@thecompostninja.com
Turkle-Clark	Solid Waste Consultants	Consultant	Cindy	Turkle	President & Sr. Environmental Professonal	turkle.clark@mciworld.com
UnityPoint Health	Industry	Generator	Scott	Draper		scott.draper@unitypoint.org
University of Iowa	Universities/Colleges	Generator	Stratis	Giannakouros	Sustainability Director	stratis-giannakouros@uiowa.edu
University of Iowa	Universities/Colleges	Generator	Beth	Mackenzie	Recycling Coordinator	elizabeth-k-mackenzie@uiowa.edu
University of Northern Iowa	Universities/Colleges	Generator	Eric	O'Brien	Sustainability Coordinator	eric.obrien@uni.edu
USPS	Industry	Transporter	Jennifer	Beiro-Reveille	Chief Sustainability Officer	sustainability@usps.gov
Van's Sanitation	Waste Management /Recycling and MRFs	Processor	Scott	VanderSluis	Owner	scott@vanssanitation.com
Vermeer Corporation	Industry	Generator	Bob	George	Environmental Health and Safety Manager	bgeorge@vermeer.com
Waldinger	Industry	Generator	Amanda	Zwanziger	Sustainability Coordinator	amanda.brend@hotmail.com
Waste Commission of Scott County	Government	Government	Brian	Seals		brian.seals@wastecom.com
Waste Commission of Scott County	Waste Management /Recycling and MRFs	Processor	Kathy	Morris	Director	kathy.morris@wastecom.com
Waste Connections	Industry	Transporter	Justin	Franks		Justin.Franks@wasteconnections.com
Waste Management, Inc.	Waste Management /Recycling and MRFs	Transporter	Julie	Ketchum	Director Government Affairs	jketchum@wm.com
Waste Management, Inc.	Waste Management /Recycling and MRFs	Transporter	Susan	Robinson	Director Government Affairs	srobinson@wm.com
Waste Management, Inc.	Waste Management /Recycling and MRFs	Transporter	Susan	Robinson	Director Government Affairs	srobinson@wm.com
Water & Resource Recovery Facility (Muscatine WWTP)	Government Related Agencies	Processor	John	Koch	Director	jkoch@muscatineiowa.gov
Water & Resource Recovery Facility, City of Muscatine	Government Related Agencies	Processor	Jon	Koch	Director	jkoch@muscatineiowa.gov
Winnebago Industries	Industry	Generator	Wayne	Venzke	Environmental Engineer	wvenzke@winnebagoind.com

ATTACHMENT B

REGISTRATION INFORMATION AND MEETING ATTENDEE INFORMATION

Stakeholder Meeting #1 - Summarized Registration Data

First Name	Last Name	Organization	Which category most represents the industry you work in?	How did you hear about this meeting?
karen	luken	eesi	Consultant	Invite e-mail
Kate	Bartelt	Foth	Consultant	DNR Publication
Lea	Hensel	Foth	Consultant	DNR Publication
Julie	Plummer	Iowa Waste Exchange	Consultant	Forwarded by colleague
Jennifer	Trent	IWRC	Consultant	Invite e-mail
Christine	Collier	SCS Engineers	Consultant	Other
Michelle	Leonard	SCS Engineers	Consultant	Invite e-mail
Michael	Miller	SCS Engineers	Consultant	Invite e-mail
April	Thompson	SCS Engineers	Consultant	Other
Anastasia	Welch	SCS Engineers	Consultant	Invite e-mail
anita	maher-lewis	Terracon	Consultant	DNR Publication
Cindy	Turkle	Turkle-Clark Environmental Consulting	Consultant	Trade association publication/newsletter
Doyle	Smith	City of Cedar Falls	Government - Regulator	Forwarded by colleague
Jeremy	Caron	City of Des Moines	Government - Regulator	Invite e-mail
Jane	Wilch	City of Iowa City	Government - Regulator	Invite e-mail
Laurie	Rasmus	DNR	Government - Regulator	Invite e-mail
Shelly	Peterson	IEDA	Government - Regulator	Forwarded by colleague
Michael	Sullivan	Iowa Department of Natural Resources	Government - Regulator	Invite e-mail
Amy	Wilken	Iowa Department of Natural Resources	Government - Regulator	Other
Jennifer	Wright	Iowa Department of Natural Resources	Government - Regulator	Invite e-mail
Tom	Anderson	Iowa DNR	Government - Regulator	Other
Amie	Davidson	Iowa DNR	Government - Regulator	Other
Jeff	Fiagle	Iowa DNR	Government - Regulator	Invite e-mail
Jennifer	Reutzel Vaughan	Iowa DNR	Government - Regulator	Other
Theresa	Stiner	Iowa DNR	Government - Regulator	Other
Reid	Bermel	Iowa DNR LQB	Government - Regulator	Other
Shelene	Codner	Iowa Waste Exchange	Government - Regulator	Invite e-mail
Becky	Soglin	Johnson County Planning, Develoment and Sustainability	Government - Regulator	DNR Publication
Robert	Palmer	Iowa League of Cities	Industry Association	Other
Scott	Cassel	Product Stewardship Institute, Inc.	Industry Association	Invite e-mail
Sydney	Harris	Product Stewardship Institute, Inc.	Industry Association	Invite e-mail
Cory	Carr	3M	Industry/Manufacturing	Invite e-mail
Jim	Withers	American Packaging Corporation	Industry/Manufacturing	Other
Kyle	Wehner	Republic Services	Industry/Manufacturing	Invite e-mail
Michele	Boney	West Liberty Foods	Industry/Manufacturing	Invite e-mail
John	Foster	Black Hawk County Solid Waste Managment Commission	Landfill Recycling Industry	DNR Publication
Lori	Dicks	Buena Vista County Solid Waste & Recycle Center	Landfill Recycling Industry	Other
Karmin	McShane	Cedar Rapids Linn County Solid Waste Agency	Landfill Recycling Industry	Invite e-mail
Jennifer	Jordan	Iowa City Landfill and Recycling Center	Landfill Recycling Industry	Invite e-mail
Alan	Schumacher	Iowa Recycling Association	Landfill Recycling Industry	Invite e-mail
William	Rowland	Landfill of North Iowa	Landfill Recycling Industry	Invite e-mail
Rick	Hurt	South Central Iowa Solid Waste Agency	Landfill Recycling Industry	Invite e-mail
Brian	Seals	Waste Commission of Scott County	Landfill Recycling Industry	Forwarded by colleague
RG	Schwarm	Iowa Recycling Association	Lobbyist	Invite e-mail
Kari	Carney	1000 Friends of Iowa	Non-Profit Organization	Invite e-mail
Margaret	Vernon	Indianola sustainability committee	Non-Profit Organization	Forwarded by colleague
Heidi	Sanborn	National Stewardship Action Council	Non-Profit Organization	Invite e-mail
Troy	Willard	Can Shed LLC	Other	Invite e-mail
Additional	Attendee	None	Other	Other
Ayo	Oluwalana	Iowa State University	School/University	Other
Merry	Rankin	Iowa State University	School/University	Invite e-mail
Joe	Bolick	Iowa Waste Reduction Center	School/University	Other
Nicole	Farrier	Recycling Reuse Technology Transfer Center - University of Northern Iowa	School/University	Forwarded by colleague
Beth	MacKenzie	University of Iowa	School/University	Invite e-mail
Jack	Stinogel	University of Minnesota	School/University	Other
julie	Ketchum	Waste Management	Solid Waste/Recycling Collector	Invite e-mail
Mary	Wittry	Carroll County Solid Waste Management Commission	Solid Waste/Recycling Processor	Invite e-mail
Mark	Peebler	City of Ames	Solid Waste/Recycling Processor	Trade association publication/newsletter
Mick	Barry	Mid America Recycling	Solid Waste/Recycling Processor	Invite e-mail
David	Mueller	Mid America Recycling	Solid Waste/Recycling Processor	Other
Kathy	Morris	Waste Commission of Scott County	Solid Waste/Recycling Processor	Invite e-mail
Susan	Robinson	Waste Management	Solid Waste/Recycling Processor	Invite e-mail
Jeff	Maxted	Alliant Energy	Utility	Forwarded by colleague

Stakeholder Meeting #1 - Meeting Attendees

Name (Original Name)
Jeff Phillips - SCS Engineers (Jeff Phillips)
Michelle Leonard - SCS Engineers (TEST test)
Christine Collier - SCS Engineers (Christine Collier)
Theresa Stiner (DNR) (Theresa Stiner)
Tom Anderson - IDNR (Tom Anderson)
Cindy Turkle
julie Ketchum (julie Ketchum)
karen luken EESI (karen luken)
John Foster (John Foster)
Julie Plummer - Iowa Waste Exchange (Julie Plummer)
Jeff Fiagle DNR (Jeff Fiagle)
Michele Boney - West Liberty Foods (Michele Boney)
Jen Wright-IDNR (Jennifer Wright)
Laurie Rasmus (Laurie Rasmus)
Mike Miller - SCS Engineers (Michael Miller)
Anastasia Welch - SCS Engineers (Anastasia Welch)
Joe Bolick - UNI Iowa Waste Reduction Center (Joe Bolick)
Merry Rankin - Iowa State University (Merry Rankin)
Amie Davidson (Amie Davidson)
Rick Hurt-SCISWA (Rick Hurt)
Troy Willard- Can Shed LLC (Troy Willard)
Jen Jordan (Jennifer Jordan)
B Soglin (Johnson County) (Becky Soglin)
Shelene Codner - Iowa Waste Exchange (Shelene Codner)
Shelly Peterson Iowa Economic Development Authority (Shelly Peterson)
Mark Peebler City of Ames (Mark Peebler)
Michael Sullivan (Michael Sullivan)
Amy Wilken - DNR (Amy Wilken)
Mary Wittry Carroll County Solid Waste (Mary Wittry)
Bill Rowland - Landfill of North Iowa (William Rowland)
Cory Carr 3M (Cory Carr)
Kate Bartelt (Kate Bartelt)
RG Schwarm
Nicole Farrier - RRTTC-UNI (Nicole Farrier)
Beth MacKenzie
Jim Withers American Packaging (Jim Withers)
April Thompson (SCS) (April Thompson)
Kari Carney 1000 Friends of Iowa (Kari Carney)
Jane Wilch (Jane Wilch)
Jennifer Trent Iowa Waste Reduction Center (Jennifer Trent)
Jack Stinogel - Gen. Public (Jack Stinogel)
Mick Barry -Mid America Recycling (Mick Barry)
Karmin McShane
Reid Bermel (Reid Bermel)
Doyle Smith
Jeremy Caron (Jeremy Caron)
anita maher-lewis
Jeff Maxted - Alliant Energy (Jeff Maxted)
Lea Hensel (Lea Hensel)
Alan Schumacher
David Mueller
Ayo Oluwalana- Iowa State University (Ayo Oluwalana)
Margaret Vernon
Heidi Sanborn (Heidi Sanborn)
Jennifer Reutzel Vaughan
Brian Seals
Phone Number - 13193516410
Phone Number - 15154909870
Phone Number - 13192738629
Phone Number - 13196276144

Total Attendees: 60

Stakeholder Meeting #1 - Poll Results

User Name	How would you rate your level of understanding of SMM?	Did you participate in the Iowa SMM Phase I process?	What industry do you represent?
anita maher-lewis	0 (None at all)	No	Consultant
Jeff Maxted - Alliant Energy	0 (None at all)	No	Industry/Manufacturer/Retailer
Jim Withers American Packaging	0 (None at all)	No	Industry/Manufacturer/Retailer
Nicole Farrier - RRTTC-UNI	0 (None at all)	No	School/University
Rick Hurt	0 (None at all)	No	Landfill/Recycling Industry
Cory Carr	1 (Little)	Yes	Industry/Manufacturer/Retailer
David Mueller	1 (Little)	No	Landfill/Recycling Industry
Doyle Smith	1 (Little)	No	Government
Jack Stinogel	1 (Little)	No	General Public
Kari Carney	1 (Little)	No	General Public
Michele Boney - West Liberty Foods	1 (Little)	No	Industry/Manufacturer/Retailer
Reid Bermel# DNR	1 (Little)	No	Government
Alan Schumacher	2 (Good)	Yes	Landfill/Recycling Industry
Amie Davidson# DNR	2 (Good)	Yes	Government
Anastasia Welch - SCS Engineers	2 (Good)	No	Consultant
Becky Soglin (Johnson County)	2 (Good)	Yes	Government
Bill Rowland - Landfill of North Iowa	2 (Good)	Yes	Landfill/Recycling Industry
Guest	2 (Good)	Yes	Government
julie Ketchum# Waste Management	2 (Good)	Yes	Landfill/Recycling Industry
Karmin McShane	2 (Good)	Yes	Landfill/Recycling Industry
Mary Wittry	2 (Good)	Yes	Government
RG Schwarm	2 (Good)	No	Landfill/Recycling Industry
Shelly Peterson Iowa Economic Development Authority	2 (Good)	No	Government
Amy Wilken - DNR	3 (Strong)	Yes	Government
April Thompson	3 (Strong)	No	Consultant
Beth MacKenzie - University of Iowa	3 (Strong)	Yes	School/University
Christine Collier - SCS Engineers	3 (Strong)	Yes	Consultant
Cindy Turkle	3 (Strong)	Yes	Consultant
Jane Wilch# City of Iowa City	3 (Strong)	Yes	Government
Jeff Fiagle DNR	3 (Strong)	No	Government
Jen Jordan# Iowa City Landfill and Recycling Center	3 (Strong)	Yes	Landfill/Recycling Industry
Jen Wright-IDNR	3 (Strong)	Yes	Government
Jennifer Trent Iowa Waste Reduction Center	3 (Strong)	No	School/University
Jeremy Caron# City of Des Moines	3 (Strong)	No	Government
Joe Bolick - UNI Iowa Waste Reduction Center	3 (Strong)	Yes	School/University
John Foster	3 (Strong)	Yes	Landfill/Recycling Industry
Julie Plummer - Iowa Waste Exchange	3 (Strong)	Yes	Government
Kate Bartelt	3 (Strong)	Yes	Consultant
Lea Hensel# Foth	3 (Strong)	Yes	Consultant
Merry Rankin	3 (Strong)	Yes	School/University
Michael Sullivan	3 (Strong)	No	Government
Mick Barry -Mid America Recycling	3 (Strong)	Yes	Landfill/Recycling Industry
Mike Miller - SCS Engineers	3 (Strong)	Yes	Consultant
Shelene Codner - Iowa Waste Exchange	3 (Strong)	Yes	Government
Theresa Stiner (DNR)	3 (Strong)	Yes	Government
Tom Anderson - IDNR	3 (Strong)	Yes	Government
Troy Willard	3 (Strong)	Yes	Landfill/Recycling Industry
Ayo Oluwalana	4 (Excellent)	Yes	School/University

Total Responses:	48	
Rank Your EMS Experience:		
"None at all"	5	10%
"Little"	7	15%
"Good"	11	23%
"Strong"	24	50%
"Excellent"	1	2%
Did You Participate in Phase I?:		
Yes	29	60%
No	19	40%

ATTACHMENT C

MEETING MATERIALS

AGENDA

Stakeholder Meeting #1

March 25th, 2021 (9:00 AM – 12:00 PM)

AGENDA ITEMS:

I. Introductions (20 Min)

A. Stakeholders, Staff and Consultants
B. Meeting Expectations

II. SMM Background (65 Min)

A. What is SMM
B. Recap and Summary of Phase I

Break (5 Min)

C. Introduction to Phase II
   I. Objectives and Approach
   II. Roles and Responsibilities of Stakeholders and Subcommittees
   III. Research
   IV. Schedule

Break (10 Min)

III. Materials Prioritization (65 Min)

A. Life Cycle Analysis Process Review
B. Material Selection Criteria

***Break* (5 Min)**

C. Selection of Prioritized Material Categories

IV. Next Steps (20 Min)

A. Identification of Subcommittee Participants
B. Questions and Answers

MEMO

Stakeholder Meeting #1

March 25, 2021

MEETING MATERIALS

Thank you for agreeing to participate in the Iowa Department of Natural Resources (DNR) Phase II Sustainable Materials Management (SMM) Vision for Iowa! We are excited to be kicking off the Stakeholder and Subcommittee Meetings! In order to prepare for the initial Stakeholder Meeting, we are providing several reference documents here for your review. The first four documents were prepared as part of Phase I of the SMM Vision for Iowa. The fifth document introduces the Life Cycle Analysis (LCA) concept to you.

The documents provided, in addition to a brief description, are listed below.

1. **White Paper: Iowa Waste Management Hierarchy – Intent and Limitations**: Overview of Iowa's solid waste management hierarchy and current trends in solid waste management.
2. **White Paper: What is Sustainable Materials Management?:** Introduction to SMM and the policies, goals and metrics that can be utilized to focus on reducing the environmental impacts of products through their entire life cycle.
3. **Iowa Sustainable Materials Management Vision for Iowa Think-Tank Report August 2019 Prepared by Future IQ and Burns McDonnell:** Summarizes the scenario-based visioning session held on May 14, 2019, in which stakeholders evaluated the opportunities and challenges of SMM in Iowa, and identified Systems Thinking as the preferred scenario for Iowa, recognizing that the transition from integrated solid waste management to sustainable materials management needs to be accelerated in order to avoid long-term and potentially irreversible damage to the planet.
4. **Iowa Sustainable Materials Management Strategic Vision for Iowa Report October 2019 Prepared by Future IQ and Burns McDonnell:** The report is based on input from the benchmarking research report, the Iowa DNR Future Think-Tank Workshop, stakeholder surveys, Iowa DNR stakeholder Focus Group meetings and direct input from the (DNR) project steering team. The visioning process provided a clear mandate for a transition from integrated solid waste management to sustainable materials management in the State
5. **Life Cycle Analysis Introduction:** Information on the goal and methods of Life Cycle Analysis. Taken from the U.S. General Services Administration Sustainable Facilities Tool website. Further information will be provided at the first Stakeholder Meeting on March 25th. https://sftool.gov/plan/400/life-cycle-assessment

In order to best be prepared for this initial Stakeholder Meeting, we ask that you take some time to review these documents and be prepared for to ask questions and provide input during the March 25th kick-off meeting for the next phase of SMM Vision for Iowa!

If you have questions beforehand, please do not hesitate to reach out to the project team. Tom Anderson is the lead for the DNR and can be reached at (515) 725-8323 or via email at tom.anderson@dnr.iowa.gov. The SCS Engineers project team can be reached at (515) 631-6160 or via email at dnrsmmiowa@scsengineers.com.

White Paper
Iowa Waste Management Hierarchy – Intent and Limitations

The original mandates of both Federal (1976 Resource Conservation and Recovery Act) and state (1987 Groundwater Protection Act, and 1989 Waste Reduction and Recycling Act) laws related to solid waste were designed primarily as a system of controls to protect human health and the environment. Iowa's waste management hierarchy was enacted in 1987, as part of the solid waste management policy set out in Iowa Code 455B.301A. The declaration of solid waste management policy states:

> *The protection of the health, safety, and welfare of Iowans and the protection of the environment require the safe and sanitary disposal of solid wastes. An effective and efficient solid waste disposal program protects the environment and the public and provides the most practical and beneficial use of the material and energy values of solid waste. While recognizing the continuing necessity for the existence of landfills, alternative methods of managing solid waste and a reduction in the reliance upon land disposal of solid waste are encouraged. In the promotion of these goals, the following waste management hierarchy in descending order of preference, is established as the solid waste management policy of the state*:
>
> a. *Volume reduction at the source.*
> b. *Recycling and reuse.*
> c. *Waste conversion technologies.*
> d. *Combustion with energy recovery.*
> e. *Other approved techniques of solid waste management including but not limited to combustion for waste disposal and disposal in sanitary landfills.*[1]

The waste management hierarchy is referenced several times in Iowa Code as a guide for decision making, setting priorities, developing solid waste comprehensive plans, and awarding financial assistance. When established, the waste management hierarchy was expected to protect public health, conserve natural resources and save energy. Established now for over 30 years, the waste management hierarchy continues to provide value as a guide for managing discarded waste. The "*Reduce, Reuse, Recycle*" component of the waste management hierarchy has also been particularly useful in providing public awareness and education to foster behaviors that reduce reliance on sanitary landfills for management of end-of-life materials.

While the waste management hierarchy provides overarching beneficial guidance in managing waste, the hierarchy is not without shortcomings. Taking place in the solid waste industry is a shift to a more holistic approach through sustainable materials management. Sustainable materials management incorporates perspectives regarding the impacts on health and the environment a material has throughout its full life cycle (cradle to grave). A material's life cycle impact begins with extraction of raw materials and continues through product manufacturing, distribution, use and ultimately end of life management rather than simply as a waste being managed under a waste management hierarchy perspective. It looks at a range of inputs and effects, such as energy use, greenhouse gas emissions, water use, toxicity, etc. and the environmental impacts at each stage of its life. Such considerations are critical when making management decisions, setting law and policy, investing in programs and infrastructure and taking action.

End of Life Focus

The waste management hierarchy provides guidance on managing end of life waste but does not sufficiently address public health and environmental impacts occurring at each step in a material's complete life cycle.

Considering the full life cycle provides a clearer and more complete picture of health and environmental impacts for each material management alternative.
An example commonly used to demonstrate the waste hierarchy end of life focus is that of packaging. From a waste hierarchy perspective cardboard packaging is preferred to that of plastic film packaging. Cardboard is readily recyclable through programs across the state. Plastic film recycling on the other hand is limited, if offered at all. For this reason the waste hierarchy prefers cardboard packaging. A sustainable materials management perspective would look at raw material inputs and environmental impacts throughout the life of the plastic packaging. From a resource and energy savings perspective, the non-recyclable plastic film packaging may outperform recyclable cardboard packaging. Plastic film may require fewer resource inputs and less energy to produce and oftentimes is smaller and significantly lighter than its recyclable counterpart to transport. Fewer resources, less energy, and efficient transportation of the non-recyclable plastic film packaging may surpass the benefits of recycling the cardboard packaging.

Defining Waste

When do materials become a waste and require end of life management? From a waste management hierarchy perspective, a material or product becomes a waste when it fulfills its intended use at which point it requires end of life management via one of the hierarchy preferences. From a sustainable materials management perspective waste is generated at each stage of a material's life cycle beginning with raw material extraction. In other words, managing waste begins with raw material extraction and waste is managed at each subsequent stage of a material's life (manufacture, distribution, use and discard). Management alternatives at each stage are considered in terms of health and environmental impacts.

Actions that fall at the top of the waste hierarchy (i.e. reduction, reuse, recycling) should not be considered waste management. Reduction is not creating waste. It is reducing the amount of a material generated. Reuse of a material is not waste, it's maintaining or extending the productive life of a material. Recycling a material is not waste, it is a feedstock for creating new items.

The Iowa Waste Exchange Program (IWE) provides an excellent example. IWE matches "waste" from one entity with another entity that views this same waste as a raw material or a product usable in their operations. Materials are being exchanged for continued use, not waste. As another example, the term e-waste is used to describe unwanted electronics when in fact, e-waste electronics contain valuable materials that serve as feedstock for other processes. In some cases, computer e-waste can be upgraded and put back out on the market as a new product. E-waste is an often used term that is not accurate when considering the full life cycle under sustainable materials management.

Reduce, Reuse and Recycling Limitations

There are cases where management alternatives within the waste hierarchy do not align with sustainable materials management. Reducing inputs on the front end (waste reduction) may have negative overall impacts when considering the full life of the materials used.

Oregon DEQ used the following examples to demonstrate where following the waste management hierarchy may conflict with sustainable materials management.

Reduce: During the construction phase of a new home with thin walls and little insulation, source reduction is employed by reducing the amount of materials used, less waste is created and less energy is used. However,

while the home is occupied greater energy and resource inputs will be required to warm and cool the house far surpassing the savings of materials and energy during construction.

Reuse: An example of where reuse, a preferred waste hierarchy alternative, does not align with sustainable materials management would be that of an old refrigerator. From a materials management perspective it may be less impactful to recycle the old, inefficient refrigerator and purchase a new energy savings model. Over the life of the new refrigerator, the benefit of reduced energy use may be greater than the resources needed to manufacture it.

Recycle: Glass is an example that from a greenhouse gas emissions perspective, glass to glass recycling is favored over glass to fiberglass production which in turn is typically preferred to using glass in local asphalt paving projects. Transporting glass even long distances to a glass manufacturer is preferable in spite of transportation impacts on greenhouse gas emissions when looking at it from a life cycle perspective. Following the waste management hierarchy, recycling is recycling. There is no preference in the manner to which glass is recycled whether the glass is recycled back into glass, into fiberglass or reused in asphalt paving.

Toxics

The waste management hierarchy does not account for public health or environmental benefits with regard to managing toxic substances. In fiscal year 2017, the state's household hazardous materials collection program diverted over 6.8 million pounds of household hazardous waste from landfilling. From a landfill diversion aspect the 3,413 tons (about 1% of waste landfilled in Iowa annually) does not seem significant. But the public health and environmental benefits of this program go beyond landfill avoidance. Landfill diversion under the waste hierarchy favors reuse and recycling of household hazardous materials. Alternatively, removing these toxics from the production stream could be a priority under a sustainable materials management system.

Weight

While the waste management hierarchy does not address measuring program success directly, the waste hierarchy is very much tied to these measures. The mechanism in place to measure program success is the weight of solid waste as it is landfilled. The investment of resources (time, money, policy development, etc.) for proper management of solid waste is based on which solid waste components weigh the most and action is then taken to divert materials from the landfill following the waste management hierarchy.

Several factors impact the weight of landfilled solid waste. Product packaging that ends up in the landfill, for example, has undergone considerable change over the past several years. Changes in packaging materials and the packaging itself has become lighter, both affect the weight being landfilled without any reduction or diversion of materials from the landfill. From a public health, environmental protection and sustainability perspective, alternatives to weight based measures are needed.

Iowa's solid waste management policy is to protect public health and the environment. Implementing waste hierarchy based on solid waste management programs, investing in infrastructure and measuring the resulting impacts on landfill tonnage, may be misdirected and do not adequately reflect public health and environmental protection. In addition to measuring solid waste landfilled tonnage, alternative measures of policy and program effectiveness and identifying targeted solid waste materials, measuring impacts on such things as greenhouse gas emissions, water use, and energy use over the life of solid waste materials should be investigated as a truer measure of public health and environmental protection.

Summary

The waste management hierarchy continues to serve a useful purpose by providing guiding principles for solid waste management and as a communication and education tool. It identifies general principles illustrating reduction at the source as most preferred and landfilling as least preferred end of life management options.

While the waste hierarchy provides some benefit, it falls short of providing the highest protection of public health and the environment and the necessary detail upon which to create new or update existing laws, policies and programs. The hierarchy does not take into account the health and environmental impacts of a material or product over the course of its life by focusing on end of life management. Supporting the waste hierarchy with an overarching consideration of environmental, economic and social sustainability components of the sustainable materials management model would provide greater benefit to Iowans. Current waste management perspectives are changing. Supported by the US EPA, other states and many countries throughout the world, assessing materials management sustainably and for each phase of a material's life from extraction through end of life management, will further enhance waste management hierarchy benefits. Sustainable materials management recognizes the environmental impacts and public health impacts beginning with extraction and continues with each subsequent stage in a material's life (production, transportation, use, and disposal).

Following the waste management hierarchy benefits Iowans and the environment and should continue to be used as a general guide for action and as a communication tool. But for reasons outlined above, the hierarchy should be enhanced by implementing a sustainable materials management system. Material management decisions, enacting new laws or policies, developing new or revising existing waste management programs, setting priorities and guiding investments should be grounded on the impact materials have throughout their full life cycle, not simply what to do with end of life discards.

White Paper

What is Sustainable Materials Management?

Sustainable Materials Management (SMM) is the systematic approach of using and reusing materials in the most sustainable way across the entire lifecycle of a particular product or material. It represents a change in thinking from the current integrated waste management system about the use of natural resources and environmental protection.[1]

Traditionally products follow the same path. Materials are harvested and used to make a product that is then sold to consumers, used by consumers and then enters the end-of-life management stage, like disposal or recycling. Environmental protection is focused on the end-of-life stage like disposal. For example landfills are required to meet regulations to ensure protection of groundwater. Products are encouraged to be collected for recycling but the current integrated-waste management system does not measure the environmental impacts of these products nor does it focus on anything but the end-of-life stage. SMM is different. It looks at each stage of a product's lifecycle and measures the resources needed as inputs to make, distribute and use the product. It also reviews the types of outputs generated during each stage of the lifecycle. Outputs like energy and water use are measured to determine the overall impact on the environment for that particular stage and that particular product.

When examining a product's lifecycle all the stages of a products life from the harvesting of natural materials through the manufacturing process to distribution, consumer use and finally, end-of-life management are analyzed to identify those materials and processes that present the greatest environmental impacts.

When examining a material's life cycle all stages are considered, as shown in **Figure 1** below. Material extraction, the manufacturing process, the distribution supply chain, consumer usage and end-of-life management are all analyzed to identify those materials and processes that present the greatest environmental impacts. By implementing SMM, a framework develops to identify opportunities to reduce environmental impacts, conserve resources, and reduce costs. Next steps can involve educating consumers on these **impacts** and how it affects them, working with producers to utilize resources more sustainably and developing policies that will reduce costs, increase technical advances and lessen the impact on the environment.

This approach allows a regulating agency to develop policies, goals and metrics that can focus on reducing specific environmental impacts of a product through its entire life cycle. Impacts including energy use, water use, greenhouse gas emissions, carcinogens or a host of other human health and environmental impacts can be used as a priority for reduction or as a measure of program success. Related additional impacts can also be considered including job creation, extension of landfill life and producer cost savings.

[1] United States Environmental Protection Agency (US EPA). (2018, August 14). "What is Sustainable Materials Management?" Retrieved September 28, 2018 from https://www.epa.gov/smm/sustainable-materials-management-basics

Figure 1

Sustainable Material Management's Life-cycle Perspective.
United States Environmental Protection Agency (US EPA). (2018, August 14) Retrieved October 25, 2018 from https://www.epa.gov/smm/sustainable-materials-management-basics.

Federal Direction

The U. S. Environmental Protection Agency (EPA) is encouraging state agencies to integrate material management approaches in existing government programs and educate the public on the benefits of the SMM approach and how it differs from the current system. Materials management is different from current waste management approaches in several important ways:

- Materials management seeks the most productive use of resources, while waste management seeks to minimize and/or manage wastes or pollutants.
- Materials management focuses broadly on impacts and policies relating to all the lifecycle stages of a material or product—including such upstream considerations as using less material, using less environmentally intensive materials, or making products more durable, as well as downstream solutions such as reuse and recycling.
- Waste management usually focuses only on what to do with wastes once they are generated. Materials management is concerned with inputs and outputs from/to the environment, including use of materials, energy and water, plus multiple environmental impacts.
- Waste management is concerned mainly with outputs to the environment (air, water, land) and usually only those from waste and only where the waste is managed. The goal of materials

management is overall long-term system sustainability, while the goal of waste management is often focused on managing a single set of environmental impacts.

- Materials management counts as responsible parties all those who are involved in the life cycle of a material or product, including industry and consumers. In contrast, waste management usually counts as responsible parties only those who generate waste.[2]

SMM provides a new way to look at material recovery and address issues prevalent in the current waste system. By utilizing resources more sustainably, reducing the amount of materials used and decreasing the overall impact on the environment, materials management can provide an approach to conserve and enhance natural resources for future generations.

State-Level

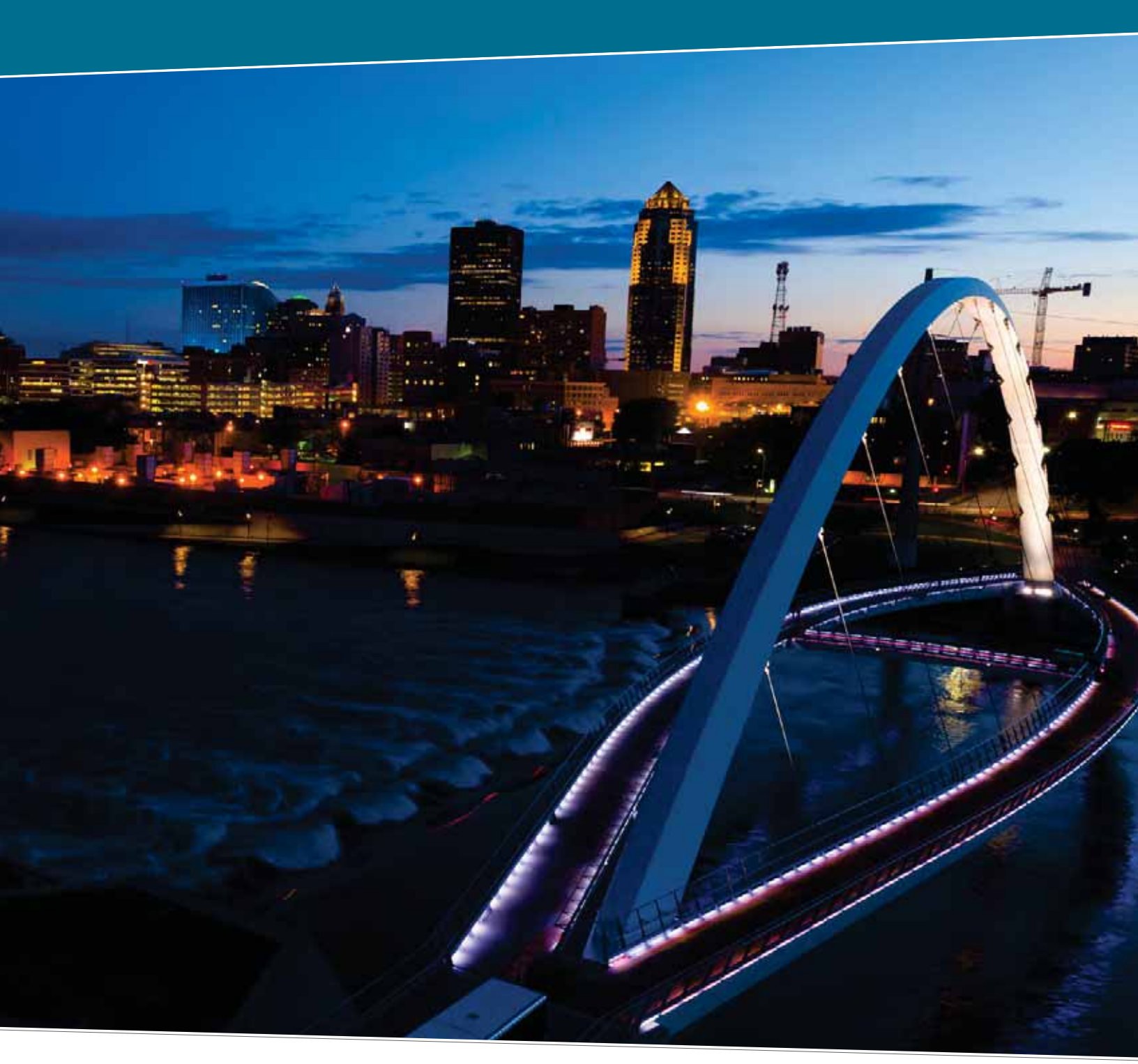
Products created and used in Iowa originate from both renewable and nonrenewable sources and follow divergent paths resulting in differing end-of-life-management. Every phase these products encounter requires inputs like energy and/or water and each stage impacts the environment.[3] SMM works to reduce these environmental impacts throughout the product's lifecycle from creation to end-of-life management. Adopting this approach will allow the state to measure a specific products influence on the air, water and land and develop corresponding policies and goals to limit its impact.

The following are a few ways Iowa can utilize a materials management approach:

1. Employ existing waste sort reports to identify the amounts and types of products currently being landfilled and determine which products and materials should be targeted for a life cycle analysis. The results of which will determine the highest and best use for each product by developing policies that feature both short-term and long-term goals that increase collection and processing of these targeted materials and reduce environmental impact.
2. Review existing environmental programs to determine if materials management elements should be added or create new programs that promote life-cycle materials management more fully.
3. Promote greener products, product stewardship and working directly with producers to lessen the environmental impact of their products and processes and save costs.
4. Expand research and innovation support programs to promote materials management.
5. Support and reward state and local champions for materials management and encourage collaboration.[4]

SMM measures the actual environmental impact of products and processes and promotes the using and reusing of materials in the most sustainable way. Any effort to implement materials management in Iowa will require a coordinated effort to engage a diverse group of stakeholders. The state working with these stakeholders will develop, prioritize and select environmental metrics for regulatory development, permitting and environmental programs that promote education, reduce producer costs and improve the Iowa environment.

[2] EPA. "Sustainable Materials Management: The Road Ahead." Page 14-15. June 2009.
[3] EPA. "Sustainable Materials Management: The Road Ahead." Page 4. June 2009.
[4] EPA. "Sustainable Materials Management: The Road Ahead. Recommendations. Page V. June 2009.



IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA SUSTAINABLE MATERIALS MANAGEMENT

VISION FOR IOWA THINK-TANK REPORT

August 2019

Iowa Department of Natural Resources

IOWA SUSTAINABLE MATERIALS MANAGEMENT

VISION FOR IOWA THINK-TANK REPORT

This report summarizes the visioning session held at Simpson College West Campus, West Des Moines, Iowa on May 14, 2019. Approximately 30 Iowa DNR stakeholders participated in the Think-Tank and developed the scenarios presented in this report. This report has been produced as part of the Iowa Department of Natural Resources sustainable materials management strategic visioning process, which aims to produce a Vision for Iowa that will guide agency activities.

Think-Tank Hosted by:

IOWA DEPARTMENT OF NATURAL RESOURCES

With support from:

ISOSWO IOWA SOCIETY OF SOLID WASTE OPERATIONS Iowa Chapter of SWANA

Report Prepared by:

future→iQ® Create **Future Intelligence**®

BURNS McDONNELL

TABLE OF CONTENTS

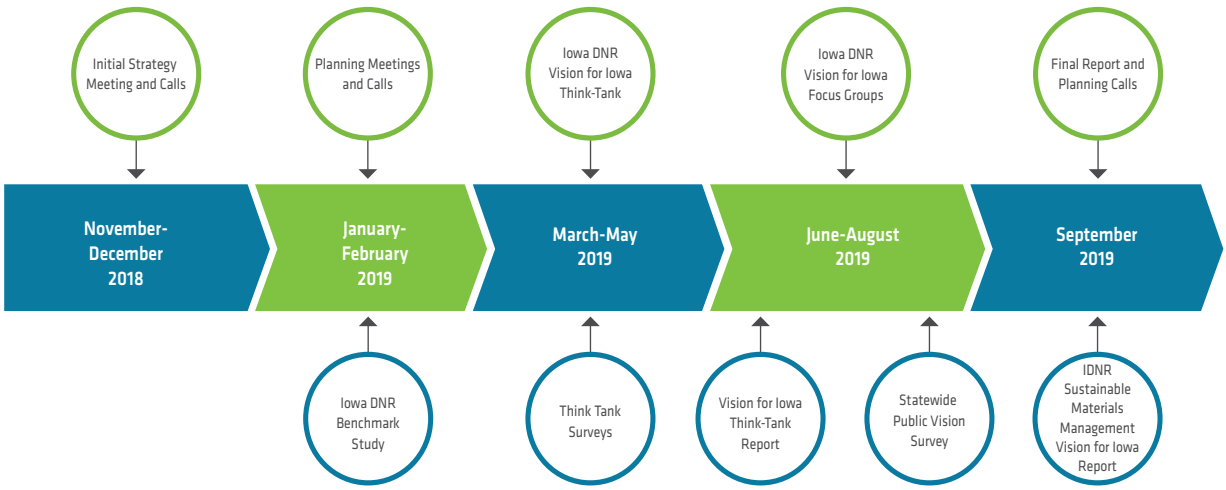
1.0 EXECUTIVE SUMMARY

In late 2018, the Iowa DNR embarked on a comprehensive Visioning Project for the future of sustainable materials management in the State of Iowa. The firms of Burns and McDonnell and Future iQ were contracted to facilitate a series of DNR and stakeholder meetings, research and outreach that will ultimately lead to the creation of a Sustainable Materials Management – Vision for Iowa that may be used as a statewide guide for future sustainable materials management related action. These processes include:

The Iowa DNR's Sustainable Materials Management – Vision for Iowa will give a coherent voice to the goals and aspirations for the future of Iowa stakeholders.

- Background research on existing laws, policies and programs
- A state-wide stakeholder survey of views on waste and materials management in Iowa
- Facilitation of an Iowa DNR Future Think-Tank
- Production of an Iowa DNR Vision for Iowa Think-Tank Report
- Stakeholder engagement in the form of focus groups
- Data collection, analysis and visualization
- Production of an Iowa DNR Sustainable Materials Management – Vision for Iowa Report with a roadmap and next step recommendations for sustainable materials management in Iowa

IDNR Sustainable Materials Management – Vision for Iowa Timeline (Phase 1)



2.0 INTRODUCTION

The Vision for Iowa Think-Tank Workshop was an exciting opportunity for Iowa DNR stakeholders to take a 'deep-dive' into the opportunities and challenges of sustainable waste management in Iowa.

This scenario-based Think-Tank report summarizes the Iowa Department of Natural Resources strategic vision and planning session that took place on May 14, 2019. The Think-Tank Workshop was conducted as part of a project to develop a long-term vision and roadmap for sustainable materials management in the State of Iowa. The components of planning work included a Think-Tank survey, long-term Scenario Planning as part of the strategic visioning workshop, and discussion about preferred and expected futures.

- **Iowa DNR Benchmark Study** – As background information for the visioning project, Burns and McDonnell conducted a benchmark study of selected sustainable materials management programs in the United States identified by the Iowa DNR.
- **Think-Tank surveys** – A survey was sent to invited participants of the Think-Tank before the workshop. This input, along with assistance from the Iowa DNR's leadership, helped to create the axes of the scenario matrix and guide the Think-Tank discussions.
- **Vision for Iowa Think-Tank workshop** – The scenario-based planning Think-Tank held on May 14, 2019, provided an important opportunity to engage Iowa DNR stakeholders in a critical dialogue about potential future impacts of sustainable waste management in the State of Iowa.

3.0 FORCES SHAPING THE FUTURE

In the face of accelerating speed of change, the key to resiliency is the ability to anticipate change and remain agile. Making the transition from waste management to sustainable materials management will require the collective involvement of all State stakeholders.

The Think-Tank provided a forum for participants to explore the forces of change shaping the future of Sustainable Materials Management in the State of Iowa. Participants at the Think-Tank explored four areas of emerging macro trends and forces of change. Perceptions around the nature of impact of these trends, both in terms of size and timing of impact, were explored to gauge how important participants consider the trends. Participants discussed the emerging trends on global, regional and local scales, and related them directly to sustainable materials management in terms of how well prepared they considered the State of Iowa. Specifically, the trend areas were:

- Demographics, population and mass urbanization
- Changing macro-economics and societal values
- Energy, food, water and changing climate
- Technology, and the next industrial revolution

Of particular relevance to the discussion on trends is the speed and scale of change occurring. Newly developed innovations are being implemented globally and locally at all scales, thereby changing the face of industries and society in a rapid and profound way. Manufacturing is at the forefront of this transformation, but other industries are also quickly developing such as agriculture, health care, biomedical research, infrastructure, energy, transportation and mobility, shipping and logistics, food services, hospitality, financial services, and retail.

To access a complete copy of the Think-Tank presentation, please visit the following link: *https://www.iowadnr.gov/FABA*

FutureInsight

FUTURE INSIGHT:

- The emerging macro trends represent 'headwinds' and 'tailwinds' for the Iowa DNR. Being able to capture the opportunities offered by technology will be critical for the Iowa DNR and its stakeholders.
- The power of consumer demand and changing societal values can not be underestimated. Changing attitudes towards waste and the environment may prove to be the most significant drivers in the transition to sustainable materials management.

The results from the stakeholder survey provide informative insight into the design of the scenario planning framework used in the Think-Tank.

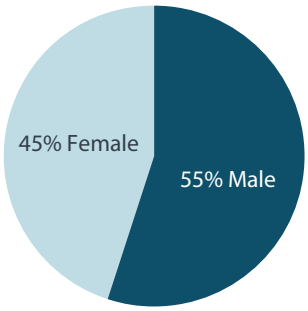
4.0 SURVEY RESULTS – KEY STAKEHOLDER INPUT

Prior to the Think-Tank, a Think-Tank survey was conducted, and 33 stakeholders responded to the survey. Respondents were asked about their views on having a shared vision for the future of sustainable materials management in Iowa. Below are the compiled results of the Think-Tank survey.

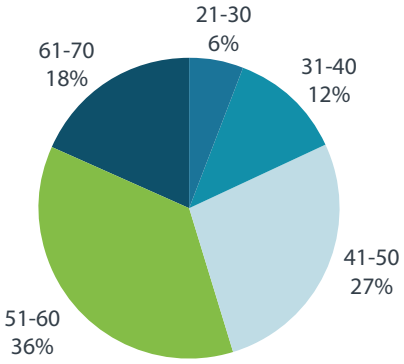
4.1 PROFILE INFORMATION

In terms of survey respondent demographics, 15 were female and 18 were male. The majority of respondents were ages of 41 or over, with 6 between the ages of 21-40. Respondents were also asked about their organizational affiliation.

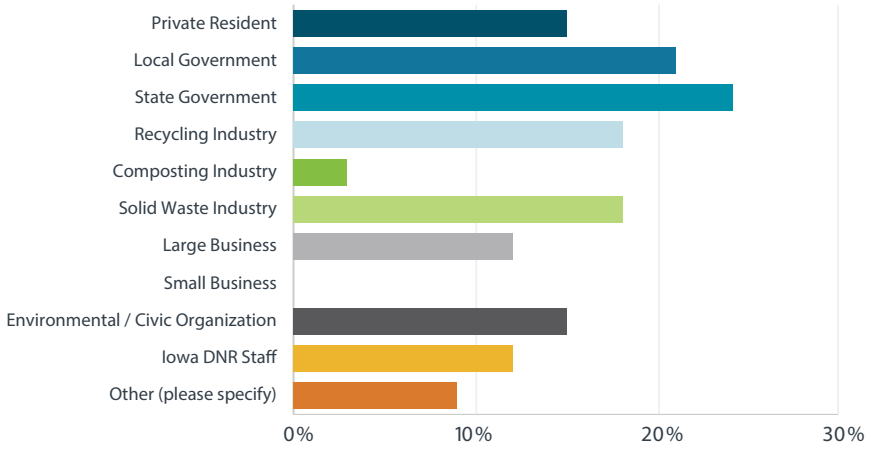
Please provide your gender



What is your age?



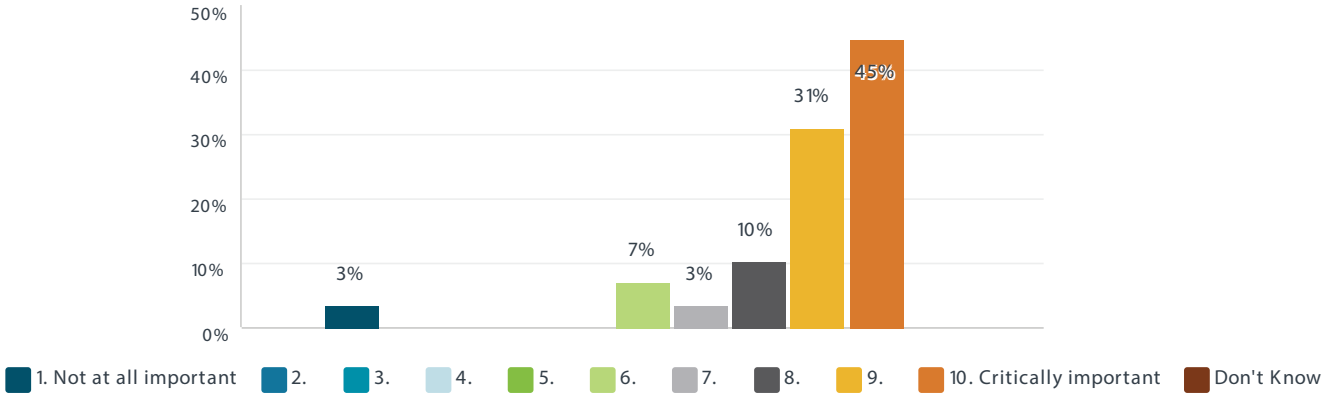
What is your organizational affiliation?



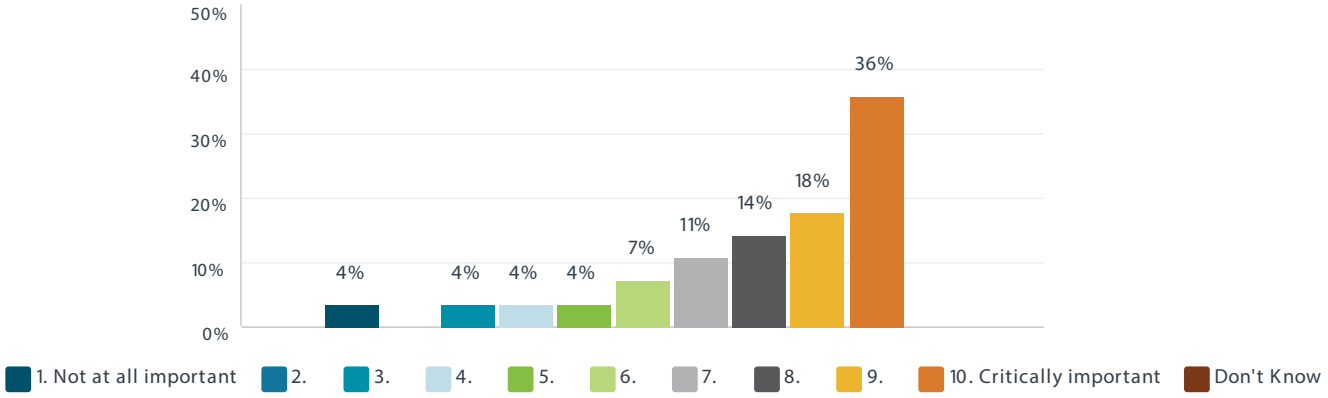
4.2 IMPORTANCE OF A SHARED VISION

Think-Tank participants were asked two questions about the importance of having a long-term vision for sustainable materials management in Iowa. The first question asked the general question, the second asked how important a long-term vision for sustainable materials management would be in making decisions for the participant's business or organization.

How important do you think it is to have a long-term vision for Sustainable Materials Management in Iowa?



How important will a long-term vision for Sustainable Materials Management be in making decisions for YOUR business or organization?



DataInsight

DATA INSIGHT:

- A long-term vision was identified as important not only for sustainable materials management in Iowa, but also for making decisions for the respondents' organizations.
- Having agreement on the importance of aligning perspectives and striving for points of consensus will help the Iowa DNR with decision-making.

The messaging surrounding the importance of making the transition from integrated solid waste management to materials management will be critical in gaining public support for necessary policy changes.

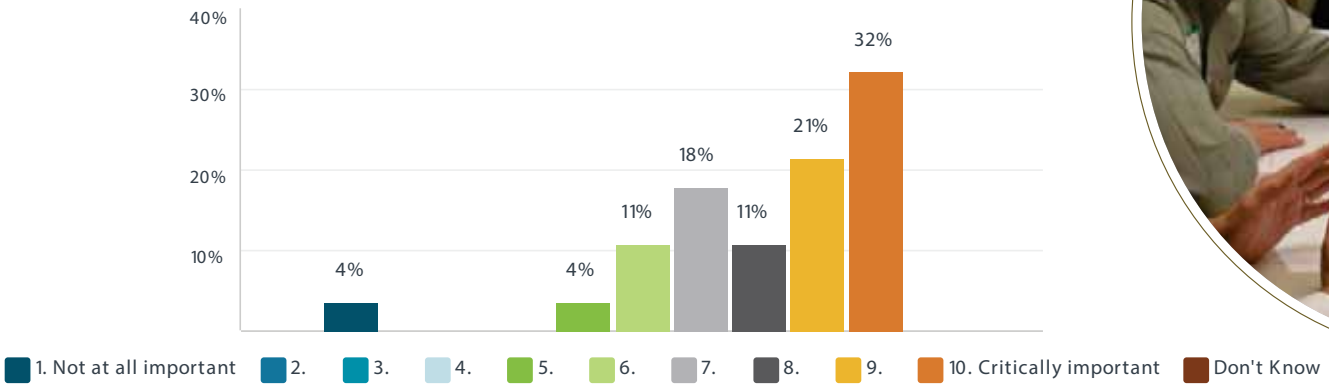
4.3 TRANSITIONING TO A SUSTAINABLE MATERIALS MANAGEMENT POLICY APPROACH

The 1987 Iowa Groundwater Protection Act and the 1989 Waste Volume Reduction and Recycling Act put into motion significant changes to policy directions concerning issues and opportunities in solid waste management in Iowa. Most significantly, these key pieces of legislation serve as a framework for integrated solid waste management where the state sits today. The basis for passage was protecting human health and the environment. The Think-Tank survey included two questions about the transition to a sustainable materials management policy approach.

4.3.1 IMPORTANCE OF THE TRANSITION

To determine the importance of the transition from waste management to materials management, survey participants were asked about the importance in terms of aiming for the highest and best use of discarded materials and improved environmental protection. Respondents overwhelmingly considered the transition important.

How important do you think it is for the State to transition from an integrated solid waste management policy to a sustainable materials management policy? (Aiming for the highest and best use of discarded materials and improved environmental protection).



DataInsight

DATA INSIGHT:

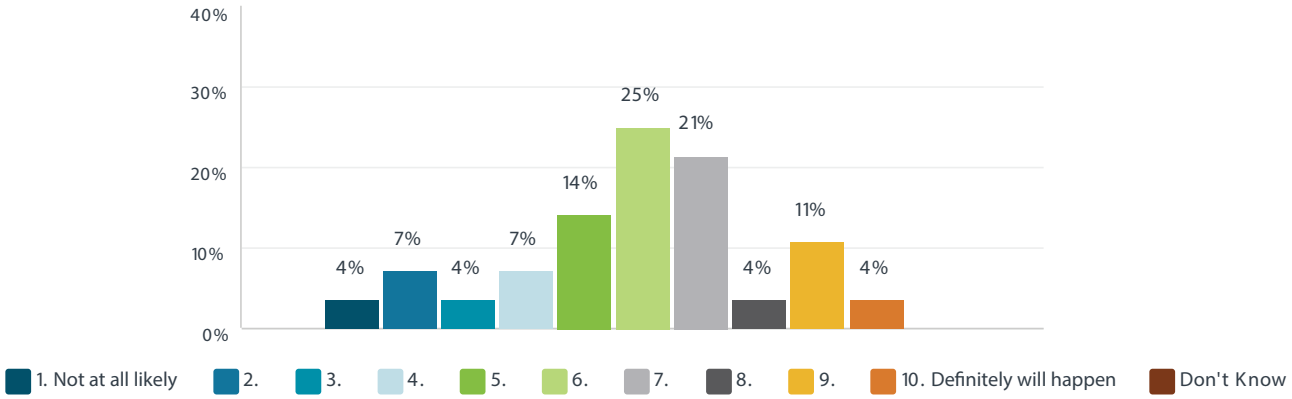
- Consistent advocacy for policy change at the legislative level will be necessary to move from integrated solid waste management to materials management in the State of Iowa.
- The key to the transition from integrated solid waste management to materials management will be the long-term sustainability of the required changes.

The timely transition from integrated solid waste to sustainable materials management will be critical in the Iowa DNR's aiming for the highest and best use of discarded materials and improved environmental protection.

4.3.2 TIMING OF THE TRANSITION

To determine when the transition from integrated solid waste management to sustainable materials management should take place, survey participants were asked how likely the transition would occur in the near future. The majority of respondents leaned towards the definite possibility that it would happen, however a third of respondents questioned the rapidity of the transition.

How likely do you think there will be a transition from an integrated solid waste management policy approach to a sustainable materials management policy approach in the near future? (Move to aiming for the highest and best use of discarded materials and improved environmental protection.)



DataInsight

DATA INSIGHTS:

- The muted response to the estimation of timing for the transition from integrated solid waste management to sustainable materials management in Iowa points to a potential challenge to gathering the public support to make the transition.
- Given participants' more reserved view about the anticipated timing of the transition, the Iowa DNR, public agencies, private sector business and industry and the Iowa legislature will need to take a proactive leadership position with respect to the State's transition from integrated solid waste management to sustainable materials management approach.

Education will play a key role in gaining support for the transition from integrated solid waste management to sustainable materials management in the State of Iowa.

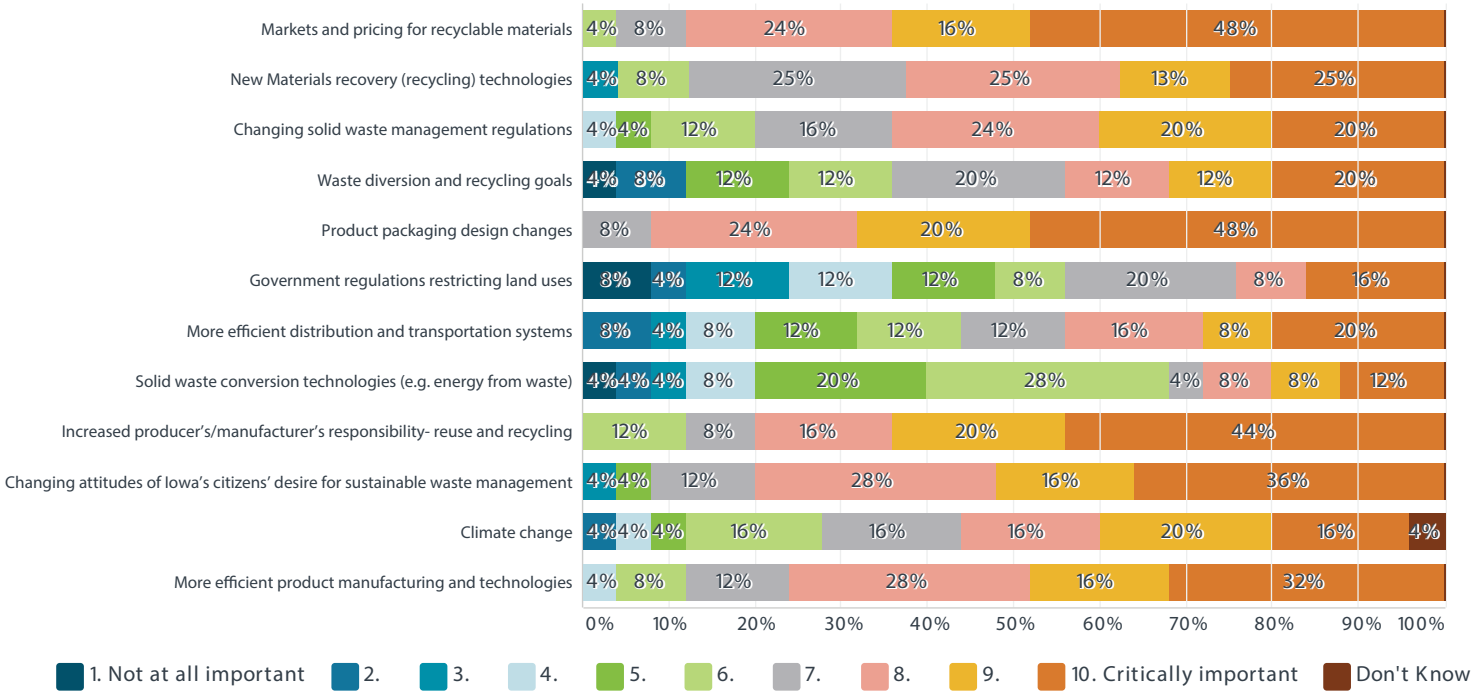
4.4 DRIVERS OF CHANGE ANALYSIS

To analyze the perceived drivers and influences on waste management in Iowa, survey participants were asked about the importance of changes in some topic areas over time, as well as Iowa's performance in addressing these drivers of change.

4.4.1 IMPORTANCE OF DRIVERS OF CHANGE

To gauge the importance of the inevitable impact of changes over time, survey respondents were asked how important changes in the following issues and sectors will be to waste management in Iowa.

For the following 'drivers of change', how important do you think they are in shaping the future of waste management in Iowa?



DataInsight

DATA INSIGHTS:

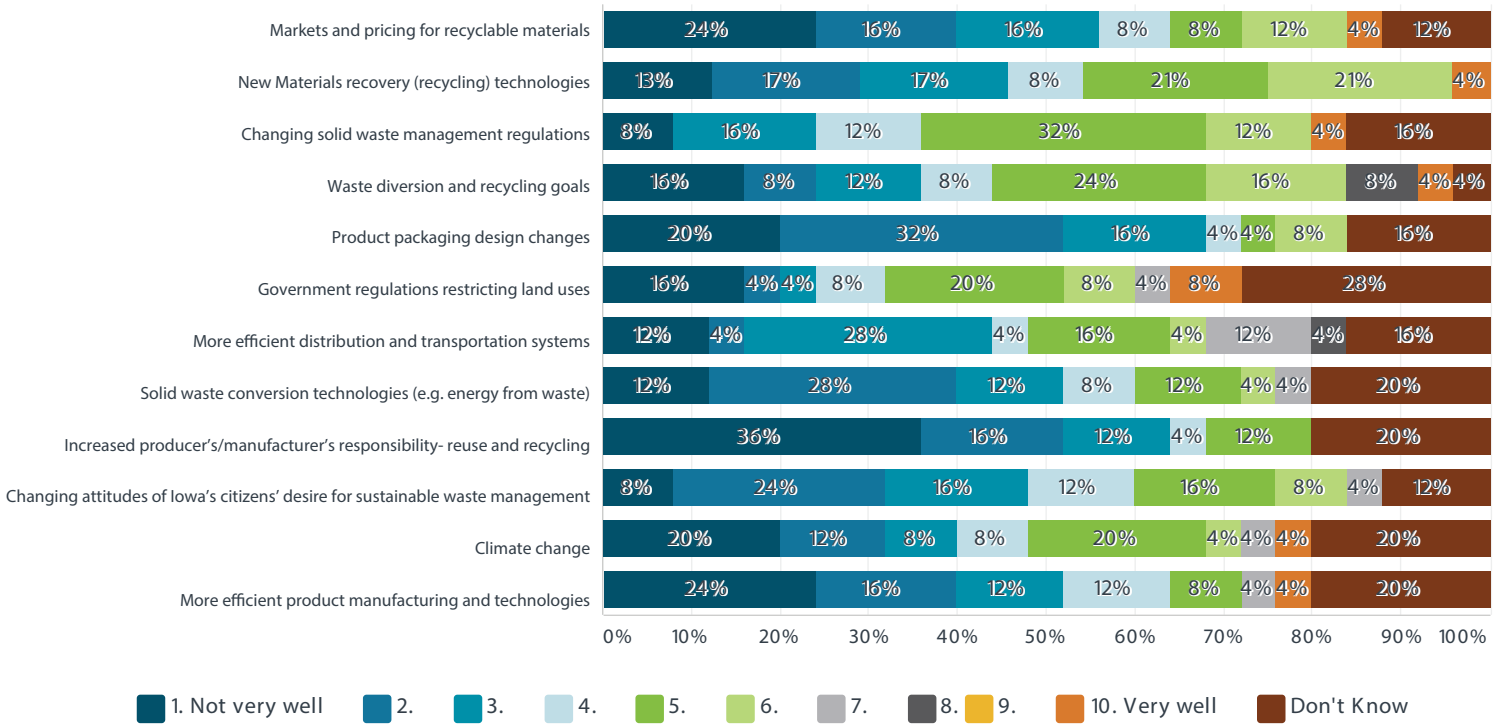
- Survey respondents considered markets and pricing for recyclable materials and product packaging design changes as the most important drivers of change in shaping the future of waste management in Iowa.
- The Iowa DNR Think-Tank is a significant step in identifying the gaps in current policy that will need to be addressed to make the transition from integrated solid waste management to sustainable materials management.

Careful planning and thought leadership is necessary to help the State of Iowa prepare for emerging trends and drivers of change.

4.4.2 IOWA'S PERFORMANCE IN ADDRESSING DRIVERS OF CHANGE

To assess how well the State of Iowa is addressing drivers of change, survey respondents were asked to rate the State's performance. Below are the results.

How well is Iowa currently addressing the following 'drivers of change'?



DataInsight

DATA INSIGHTS:

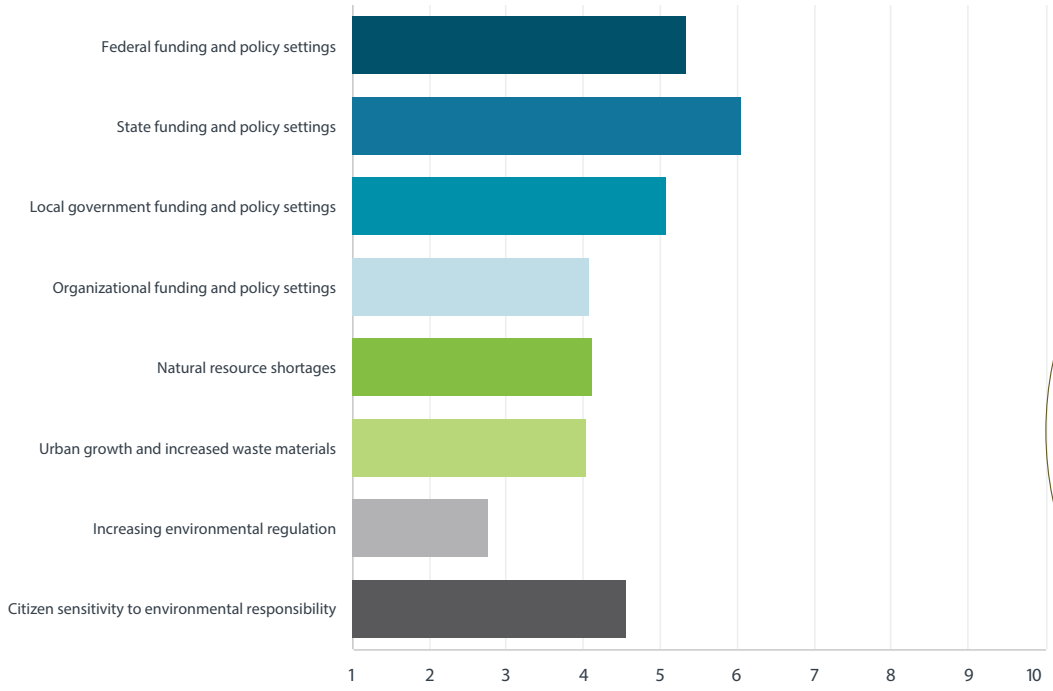
- Iowa was considered by survey respondents to not perform well in the area of increasing producers'/manufacturers' responsibility for materials reuse and recycling and product packaging design changes.
- Consumer and producer education will play a key role in helping the State of Iowa make the transition from integrated solid waste management to sustainable materials management.
- Legislative support is critical to the transition toward sustainable materials management as the policy of the State of Iowa.

4.5 IMPORTANCE OF FACTORS

To gauge the relative importance of certain factors and their impact on the future of solid waste management in Iowa, survey respondents were asked to rank eight factors identified by the Iowa DNR as important. State funding and policy settings were ranked the most important factor by survey respondents, with Federal and local funding and policy settings ranked closely as second and third.

Increased funding at all levels will be required to help transition from integrated solid waste management to sustainable materials management in Iowa.

In terms of their impact on the future of solid waste management in Iowa, RANK the relative importance of the following factors. (10 = highest rank; 1 = lowest rank)



DataInsight

DATA INSIGHTS:

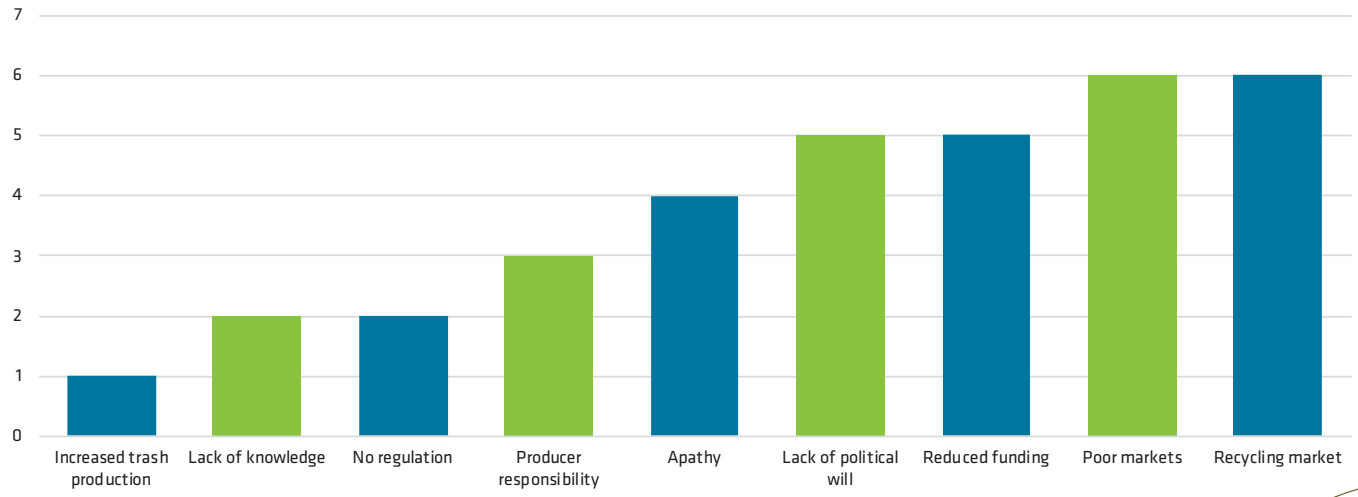
- All of the factors identified by the Iowa DNR were considered relatively important by survey respondents.
- Changes in citizen perceptions to environmental responsibility have been key elements in gaining support to alter the direction of integrated solid waste management towards sustainable materials management in other leading states such as Oregon and Vermont.

Lack of political will and apathy are issues that may impede Iowa from moving forward on its transition from integrated solid waste management to sustainable materials management. The IDNR will need to lead the state in its efforts to support the transition.

4.6 VIEWS OF THE FUTURE – THREATS FACING WASTE MANAGEMENT IN IOWA

As a measure of where Iowa DNR stakeholders considered the State of Iowa unprepared or threatened by future impacts, survey respondents were asked to cite in narrative form what they believe are the biggest threats facing waste management in Iowa in the future. Initial results show considerable concern over markets, in particular the recycling market, reduced funding, lack of political will and apathy, as primary concerns.

What do you think are the biggest threats facing waste management in Iowa in the future?



FutureInsight

FUTURE INSIGHTS:

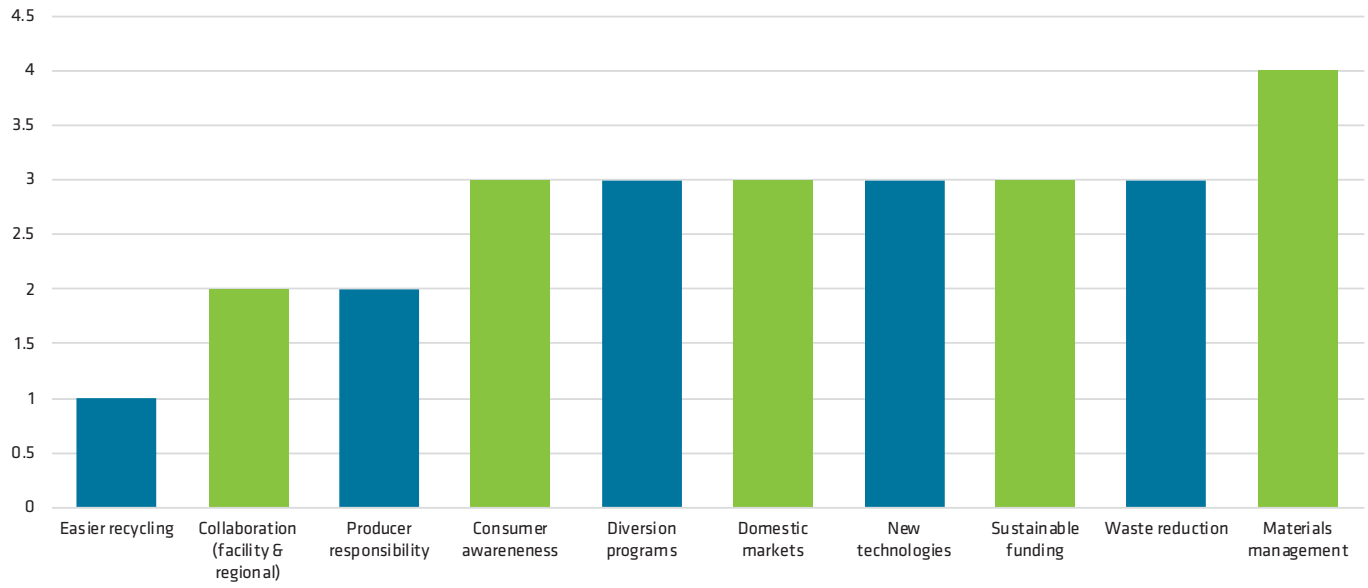
- Addressing perceived threats to waste management will take visible leadership in both public and private sectors in order to achieve the desired transition to sustainable materials management.
- The reliance on international markets for recovery and reuse of recycling products has weakened the U.S. position to achieve sustainable materials management.

4.7 VIEWS OF THE FUTURE – OPPORTUNITIES FACING WASTE MANAGEMENT IN IOWA

Purposeful leadership will be needed to guide the IDNR as it leverages support for change going forward.

In order to ascertain where Iowa should focus its efforts in leveraging resources, survey respondents were asked to describe in narrative form what they believed were the greatest opportunities facing waste management in Iowa. Materials management was identified as the greatest opportunity, followed by an equal prioritization of waste reduction, sustainable funding, new technologies, domestic markets, diversion programs, and consumer awareness.

What do you think are the biggest opportunities facing waste management in Iowa in the future?



FutureInsight

FUTURE INSIGHTS:

- Achieving a closed-loop systematic and sustainable materials management process for Iowa is key to progressing the IDNR's Sustainable Materials Management - Vision for Iowa project.
- The impact of future trends in materials management technology such as artificial intelligence will accelerate the State of Iowa's goals.
- In the State of Iowa, increased materials management infrastructure, sustainable product manufacturing, packaging, distribution and recovery will realign reuse and recycling markets in support of sustainable materials management.

The scenario planning process allowed IDNR stakeholders to examine the implications of choices about future direction.

5.0 SCENARIO-BASED THINK-TANK

The Iowa DNR's scenario-based Think-Tank was conducted on May 14, 2019 and included state-wide stakeholders including business, industry, and governmental representatives. Approximately 25 people attended this five and a half-hour session. The session was intended to build coherency around initial future planning for sustainable materials management that will guide state-wide stakeholders in the future.

Future iQ's Scenario Planning process provides a method to explore plausible futures and consider the implications of various future scenarios. The Think Tank workshop aimed to:

- Deepen the understanding and examination of how external events and local conditions could shape decision-making
- Identify and understand the key influences, trends, and dynamics that will shape the materials waste management looking out to 2030
- Create and describe four plausible long-term scenarios for the IDNR
- Begin exploring alignment around a shared future vision
- Examine the strengths and weaknesses of the sustainable materials management as perceived by the stakeholders

The scenarios developed during this Scenario Planning process and outlined in this report are important to provide a framework to discuss future possible outcomes and implications for sustainable materials management in Iowa. In addition, the Think-Tank deliberations can assist in identifying key actions for the State and in exploring how various groups might collaborate to best contribute to future policy-making.

Think-Tank participants were guided through a Scenario Planning process to develop four plausible scenarios for the future of the State. The process involved exploration of local trends and forces of change; development of a scenario matrix defining four plausible scenario spaces for the future; and, the development of descriptive narratives of each scenario. The event concluded with discussion of the scenarios, selection of a preferred scenario, consequences of inaction.

FUTURE-SPLITTING QUESTION

The scenario-planning process provides a way to tease out plausible future scenarios and examine them from a speculative standpoint. They represent different possibilities for the future.

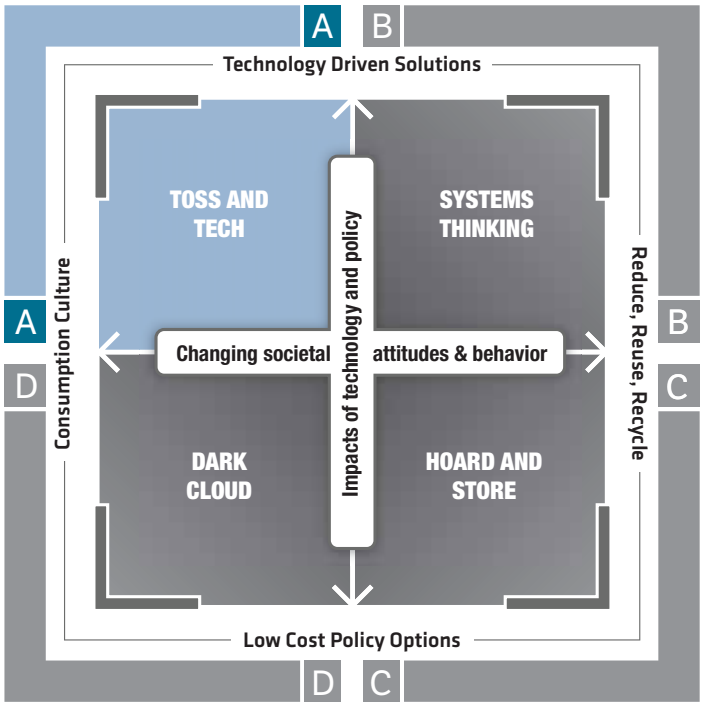
6.0 CREATING THE SCENARIO FRAMEWORK

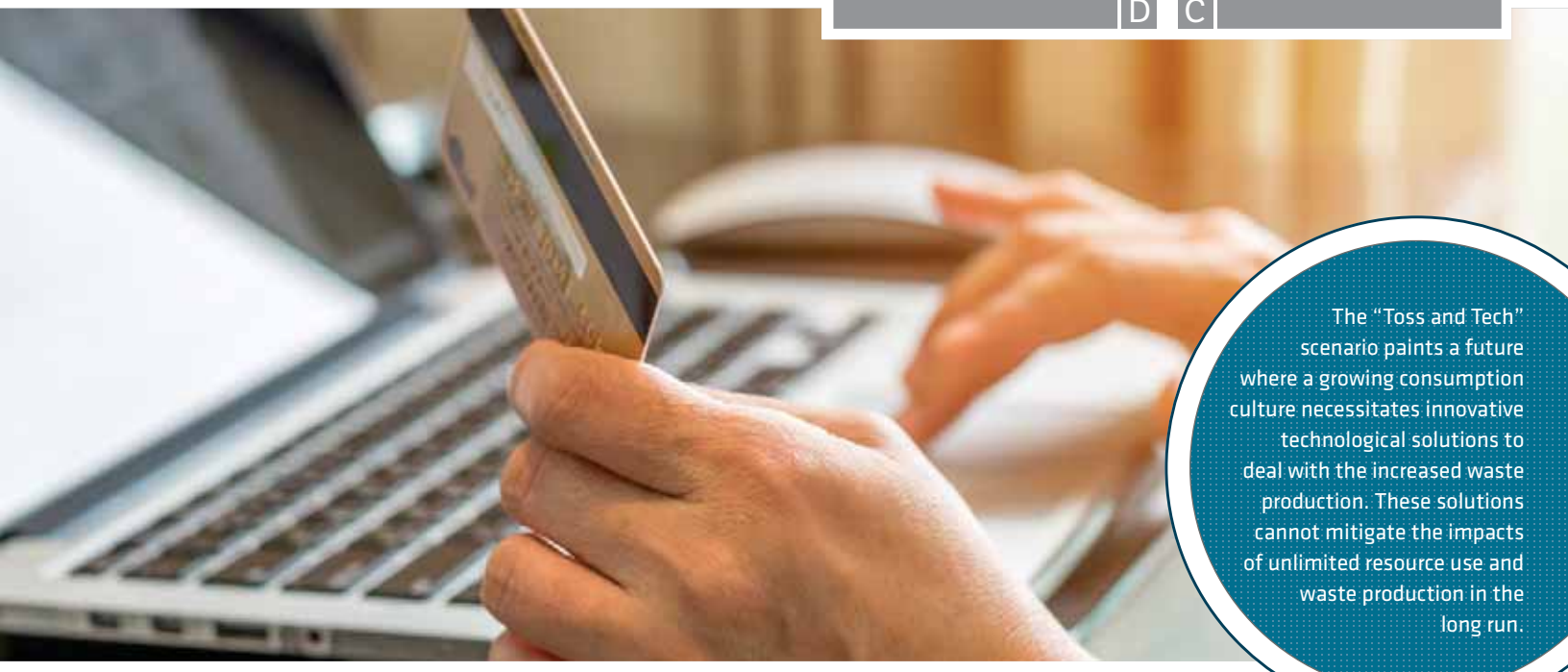
Based on the Pre-Think-Tank survey responses and key input from IDNR staff, themes were identified to become the basis for two axes on the scenario matrix. The two axes identified were **Changing Societal Attitudes and Behavior** and **Impacts of Technology and Policy**.

Think-Tank participants were presented with the scenario matrix, defined by the two major axes of 'Changing Societal Attitudes and Behavior' and 'Impacts of Technology and Policy' (see diagram). Brief descriptions were also attached to the end points of each driver axes. Participants were divided into four groups to develop a narrative for each scenario. Each group was asked to describe the characteristics of Iowa waste management in 2030 under the conditions of the scenario quadrant that they had been given. After the characteristics were established, Think-Tank participants were asked to devise major events or headlines of how the scenario occurred using the years 2020, 2025, and 2030, and to give their scenario a descriptive name. Narratives and descriptions of each scenario as developed by the workshop participants are included in the following sections.

6.1 SCENARIO A: TOSS AND TECH

This scenario forecasts a future where societal attitudes and behavior remain consumption based and there is no effort to curb material desires or waste production. Online retail continues to increase, and the priority is on delivering individual consumer choice at the lowest price possible. More complex packaging creates an expanded array of products being used for packaging to deal with the increased waste. To deal with the increased volume of waste, policy decisions encourage innovation and technology driven solutions to waste production. Single stream MRF improvements include optical sorters and robots to improve sorting and material recovery with less labor costs to improve profitability for operators. Use of anaerobic digestion and pyrolysis increases, and new public-private partnerships form to expand funding resources for materials waste management.





The "Toss and Tech" scenario paints a future where a growing consumption culture necessitates innovative technological solutions to deal with the increased waste production. These solutions cannot mitigate the impacts of unlimited resource use and waste production in the long run.

In the 'Toss and Tech' scenario, consumers enjoy unlimited retail choice and cost competitiveness. Technology driven waste management solutions allow a laissez-faire attitude to resource use. Eventually the world's finite resources begin to limit the capacity of this scenario to keep pace with demand.

SCENARIO A CHARACTERISTICS - Toss and Tech – 2030

The characteristics of this scenario paint a future where Iowa deals with increased waste production by using technology to mitigate the impacts of excessive resource use and material waste production. Consumer sentiment is not about preservation but rather choice and is oriented towards unlimited consumption. A focus on innovation propels the industry to adopt next generation waste management technologies, but over time cannot keep up with materials management sustainably.

Consumption Patterns and Waste Types

Per person consumption rates increase as online retail provides abundant choice and price competitiveness.

- Recycling and solid waste production increases proportionally requiring more advanced technical solutions.
- Waste types see a decrease in paper, more corrugated materials and plastics, and more complex packaging especially single serving containers and 'on the go' food.
- Technology innovation follows where the waste materials are directed: landfills, recycling facilities, anaerobic digestion, etc.

Policy Setting and Application of Technology

Policy makers seek next generation waste management technologies to deal with the increased waste and dwindling resources.

- New funding sources are needed to cover cost of waste disposal; this includes tip fee increases, collection and non-compliance fees and advanced disposal fees on electronics, core charges and tires.
- Single stream MRF technology improvements include optical sorters, robots to improve sorting, anaerobic digesters, and material recovery with less labor costs and improved profitability.
- Policy focus includes assigning waste generators responsibilities such as taking back materials and financially versatile transfer stations.

Waste Management Systems Being Utilized

A variety of waste management systems are being used to accommodate the increase of consumer waste.

- Creative partnerships emerge to effectively and efficiently process the increased waste of consumers, in particular public-private partnerships.
- Consideration is given to expanding land use regulations to deal with materials management if necessary. Farm lands are reduced.
- Waste processing is funded by waste generators.

2020 HEADLINE NEWS:

"Packaging waste increases exponentially"

2025 HEADLINE NEWS:

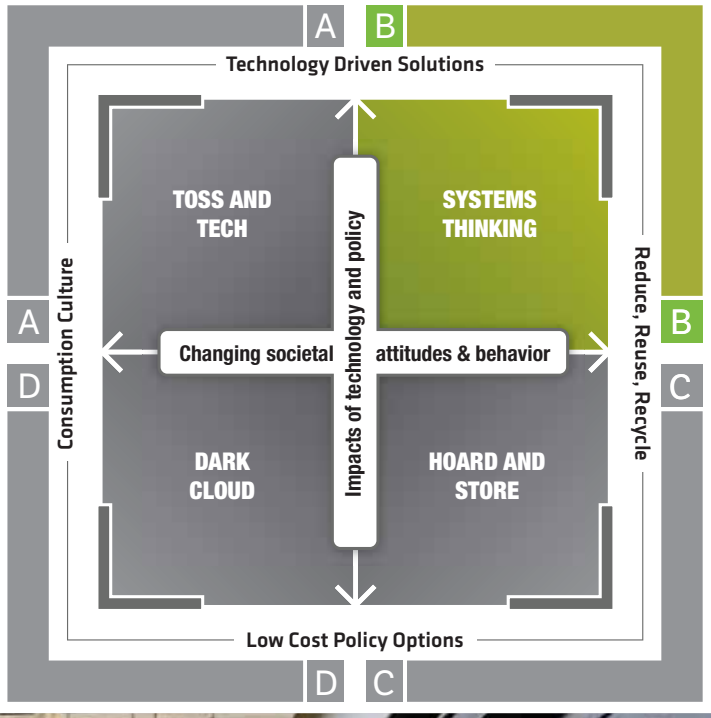
"Businesses and residents push back on new waste policy and fees"

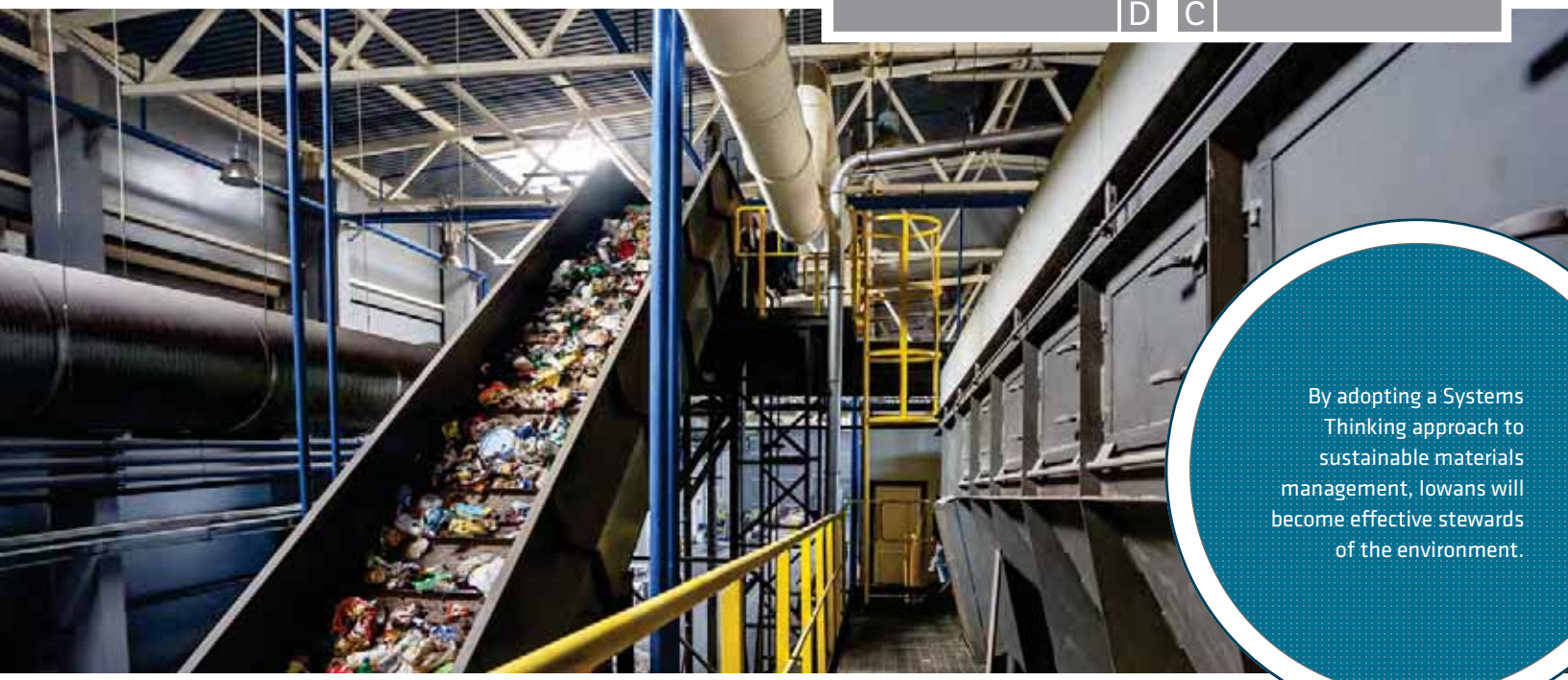
2030 HEADLINE NEWS:

"Automation at MRF and improved source separation increases marketability of recovered materials"

6.2 SCENARIO B: SYSTEMS THINKING

This scenario forecasts a future where use of technology solutions and environmentally-friendly policy ensure materials are designed, used and disposed of in the most environmental and sustainable ways. Society maintains a culture of collective responsibility and shared solutions that takes a systems-wide sustainable approach to materials management. A focus on technology that incorporates life-cycle processes propels Iowa into a national leadership position on sustainable materials management. Proactive policies that anticipate changing societal attitudes and behavior towards consumerism are funded and implemented and the goals of zero-waste industries become a reality.





By adopting a Systems Thinking approach to sustainable materials management, Iowans will become effective stewards of the environment.

In the 'Systems Thinking' scenario, focus is on finding the 'highest and best' use for everything.

SCENARIO B CHARACTERISTICS - Systems Thinking – 2030

The characteristics of this scenario paint a future where Iowa uses technology to completely integrate systems that deal with waste and materials management. Societal values emphasizing the reduce, reuse, recycle philosophy drive a sense of collective responsibility for the prevention of environmental degradation. A complete closed-loop system is idealized and sought.

Consumption Patterns and Waste Types

A culture of collective responsibility and shared solutions prevails.

- Iowa invests more dollars and provides policies that emphasize 'sharing' resources over consumption of products.
- Production aided by technology produces more local, edible food crops reducing transportation and packaging needs.
- Technology innovations create opportunities for eliminating unnecessary consumption, unnecessary use of inputs/chemicals, wasted food, etc.

Policy Setting and Application of Technology

Technology and polices ensure materials are designed in the most environmentally and sustainable manner.

- Policies are integrated to prioritize sustainable materials management (hazard mitigation, land use, transportation, building codes, energy & water policy, etc.)
- Investments leverage and provide multiple use benefits: example - roads are also storm water, air quality, public art, community spaces, and local food production opportunities.
- Policies focus on Life Cycle and energy reduction first and drive thinking about what we are making, how we make it, why we are making it, and with what materials.

Waste Management Systems Being Utilized

Waste management becomes a true systems approach and goes beyond municipal solid waste management.

- New and highly automated MRFs are doing more than managing materials.
- Waste management becomes truly a 'system' from need to design, to manufacturing, to transportation, to consumption, upcycling, energy recovery to disposal.

2020 HEADLINE NEWS:

"Iowa invests in technology and policies to change approach to waste management"

2025 HEADLINE NEWS:

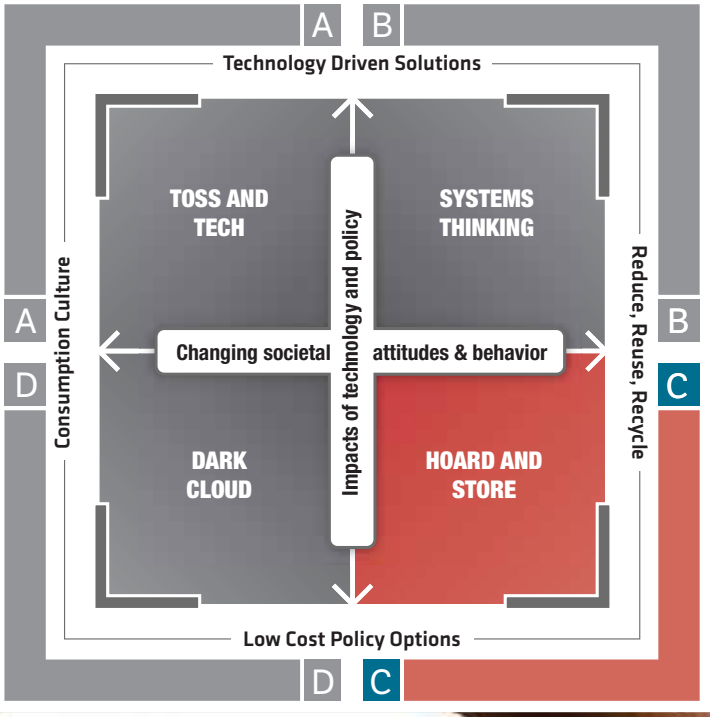
"Iowa replicates 'complete streets' approach to materials management"

2030 HEADLINE NEWS:

"Technologies and policies changes behavior along entire supply chain"

6.3 SCENARIO C: HOARD AND STORE

This scenario forecasts a future where consumers are highly educated about recycling and reuse, but there is no political will at the governmental level to enact strict policies. There is a lack of funding for next generation waste management technologies, and landfills continue to be the management solution of choice. Over time, as newer technology ages and becomes less expensive, this scenario sees those technologies added to the options available to mitigate the impacts of landfill use and increased packaging waste. This approach to materials management bogs down in the long-run as its low-tech, low-cost approach cannot keep up with consumer and producer waste production.



The 'Hoard and Store' scenario juxtaposes the societal concern for environmental responsibility and the regulatory goals of maintaining a low-cost approach to waste management.

In the 'Hoard and Store' scenario, the savvy consumer pushes for low-cost, low-tech solutions to materials management.

SCENARIO C CHARACTERISTICS - Hoard and Store – 2030

The characteristics of this scenario paint a future where Iowa seeks to pursue integrated local waste management systems. Consumer pressure to adopt environmentally sound policies are recognized at the local level, but there is no political will or funding at the State or Federal level. Iowa is a follower, not a leader in the transition from waste management to materials management.

Consumption Patterns and Waste Types

Society has a high-level understanding of environmental impact along with the financial impacts.

- This is an avid recycling society focused on reduction through education, material management and access to infrastructure.
- Manufacturers make the decision for reduced and easily recycled packaging along with extended lifecycles through replaceable parts.
- Iowans recognize the value of reduce, reuse, recycle, but desire low-cost solutions and traditional approaches to waste management.

Policy Setting and Application of Technology

At the government level, there is very little policy making and no technology investments.

- Driven by consumer demand, manufacturers make the decisions to bring in technology and reduced waste in manufacturing principles. Lowest cost solutions are sought.
- Efforts are made to provide education on waste management with local infrastructure and manufacturing.
- No regulatory changes cause Iowa to fall behind in the transition from integrated solid waste management to sustainable materials management.

Waste Management Systems Being Utilized

Current waste management systems continue to be utilized.

- Iowa continues to use existing landfills while at the same time using a 'reduce, reuse, recycle' approach.
- Iowa is a follower, not a leader in waste management technologies.
- As technology costs come down and society pushes manufacturers to reuse and recycle, there would be a shift towards pulling more out of the landfill stream.

2020 HEADLINE NEWS:

"No regulatory changes in store for immediate future"

2025 HEADLINE NEWS:

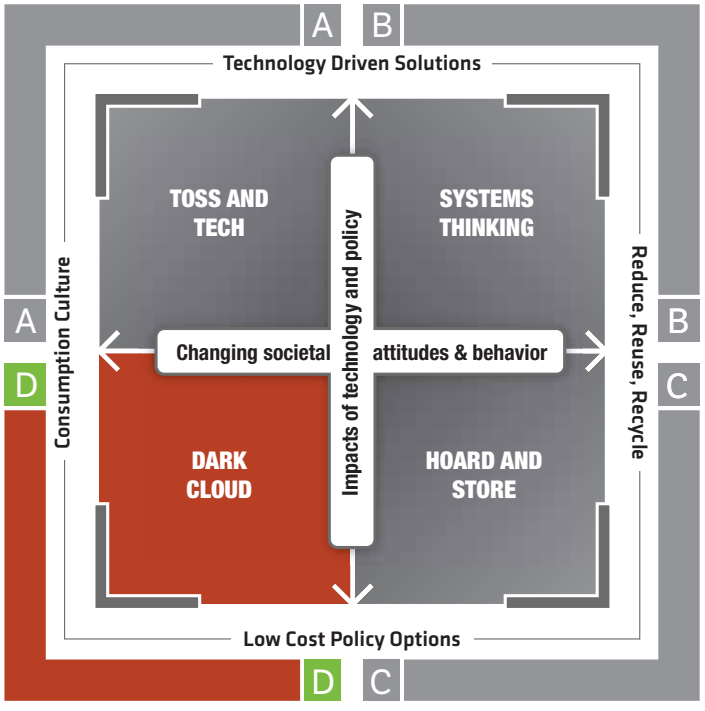
"Manufacturers respond to Iowans' demands for sustainable materials in packaging"

2030 HEADLINE NEWS:

"Iowans come together with a common goal for sustainable materials management"

6.4 SCENARIO D: DARK CLOUD

This scenario forecasts a future where Iowa slowly becomes overwhelmed with waste. Society remains consumption based with complete disregard for the impacts of its orientation. Rural areas and increasingly dense urban areas experience educational challenges and resistance regarding needed changes in waste management practice and policies. There is no funding or political support to transition to a sustainable materials management approach in Iowa. Low employment rates make MRFs struggle to find a labor force to manage an increasingly overburdened waste management system. Iowa sees a decrease in usable farm land due to increased landfill needs.



The "Dark Cloud" scenario portrays the worst possible outcomes for the future of waste management in Iowa. Maintaining the status quo in waste management would have severe negative consequences for Iowa's living and built environments.

Major big-box chain closes brick and mortar stores for increased online retail.

SCENARIO D CHARACTERISTICS - Dark Cloud – 2030

The characteristics of this scenario paint a picture where a dark cloud of waste-produced pollution gradually fills the land, air, and water resources of Iowa. The impacts of a low-cost, low-tech approach to materials management cannot keep up with consumer demand and resources are slowly depleted.

Consumption Patterns and Waste Types

The consumer focus is on lowest cost packaging and high-volume online retail use.

- Online retail sales is causing increased demand for refillable, reusable and recyclable packaging materials for homes and supply chain.
- Messaging becomes increasingly conflicted about materials management.
- Food waste diversion and composting remains limited.

Policy Setting and Application of Technology

With no change in policies, Iowa waste management continues with limited change.

- Product stewardship involves a deposit system for electronics and HHM materials to place more burden on manufacturers and retailers.
- Recycled cardboard is banned at local landfills as a low-cost policy option.
- Iowa loses its Bottle Bill contributing to additional waste production across the State.

Waste Management Systems Being Utilized

Waste management systems are localized and there is a reliance on people for waste collection and MRFs to sort and manage waste.

- There is a reliance on coal plants to burn trash and biomass for energy recovery (cement kilns), and a continued increase of landfills to manage waste.
- Environmental quality is at an all-time low due in part to failed recycling markets.
- Severe environmental losses occur in the areas of water, air (due to climate change), resources, and land for agriculture.

2020 HEADLINE NEWS:

"Major box store closes brick and mortar store for increased online retail"

2025 HEADLINE NEWS:

"Iowa legislature kills Bottle Bill"

2030 HEADLINE NEWS:

"DOT overwhelmed by litter: Litter increases by 50% in roads and ditches"

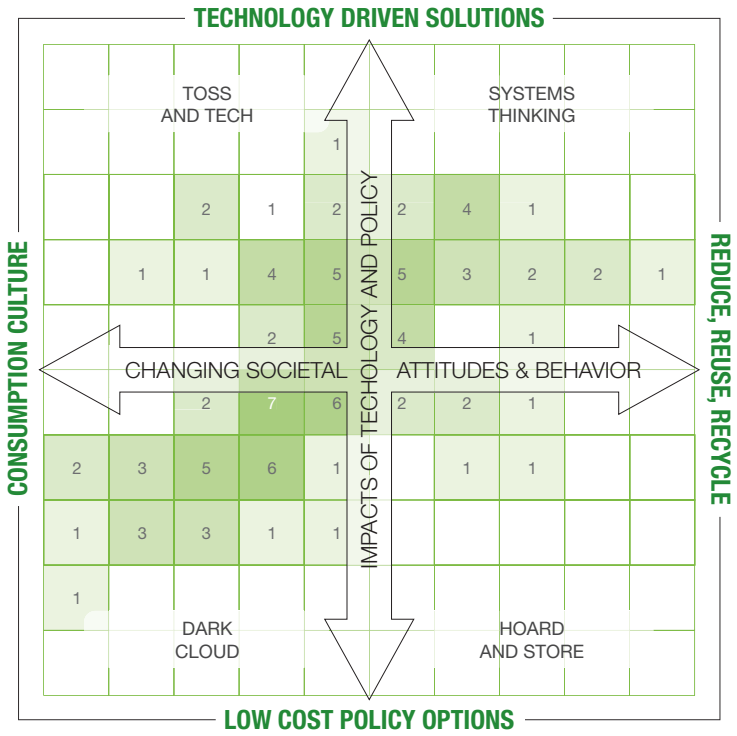
IDNR stakeholders were aligned around the common view of the expected future if no actions are taken to change societal attitudes and behavior around materials management in Iowa. This will take a quantum shift in education for consumers and producers.

7.0 EXPECTED AND PREFERRED FUTURES

7.1 EXPECTED FUTURE – SCENARIO D – DARK CLOUD

The expected future is one deemed most likely to happen if there is no change in the current trajectory of materials management in Iowa. Workshop participants mostly indicated that Scenario D, "Dark Cloud", is the scenario they believed represented the expected future for materials management in the State of Iowa. Think Tank participants discussed the importance of timing and gave a sense of urgency to making the transition from integrated solid waste management to sustainable materials management in order to avoid the "Dark Cloud" scenario.

Iowa Sustainable Materials Management Think-Tank Heatmap



FutureInsight

FUTURE INSIGHTS:

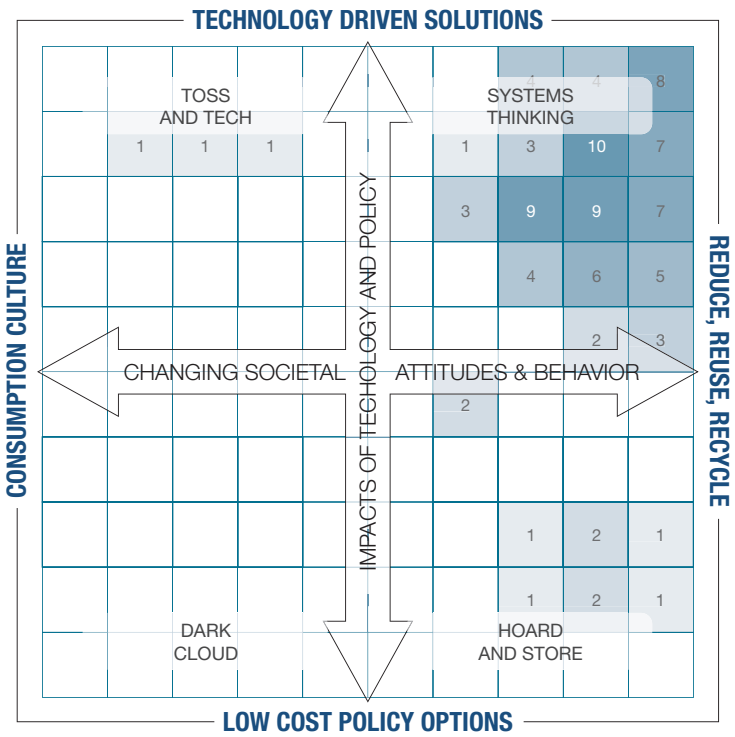
- The path to the expected future may be considered less costly and allow for greater consumer freedom in the short run, but this will eventually cause resource shortages and irreversible environmental damage in the long-run.
- With apathy and lack of political will considered two of the biggest threats to facing the future of waste management in Iowa, unified and concerted policy directives will be needed to change course from the expected future.

Systems thinking requires a holistic and integrated approach to sustainable materials management.

7.2 PREFERRED FUTURE – SCENARIO B – SYSTEMS THINKING

While each of the scenarios were viewed as plausible, Think-Tank participants expressed a clear preference for one of the presented outcomes, Scenario B, "Systems Thinking". Think-Tank participants discussed the critical need to both utilize new technologies and shift policy and local sentiment to support the integrated systems conditions of Scenario B. Noting a societal reconfiguring in demographics, the millennial cohort is considered significant to this effort in that research shows they are very concerned about environmental degradation, resource and materials usage, and have made these issues political priorities.

Iowa Sustainable Materials Management Think-Tank Heatmap



FutureInsight

FUTURE INSIGHTS:

- A definite preference for the Systems Thinking scenario indicates a clear mandate for leadership to take actions that support that vision for the future.
- The scenario title "Systems Thinking" was significant to participants in that it intended to represent the need for collective responsibility and shared solutions for materials management in the State of Iowa.

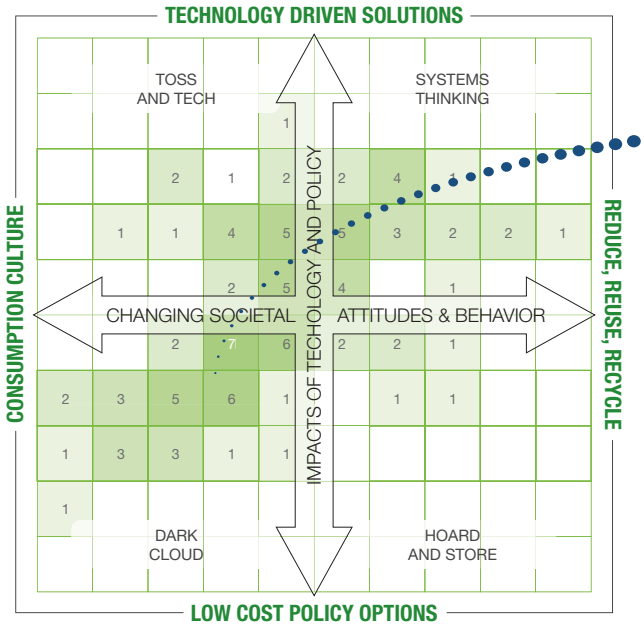
Because of the long-term nature of the Scenario Planning methodology, stakeholders often see the 'distant future vision (2030)' as unattainable and unrealistic. However, this underestimates the progress that can be made during the intervening years, and the cumulative positive impacts of change.

8.0 NEXT STEPS – GETTING TO THE PREFERRED FUTURE

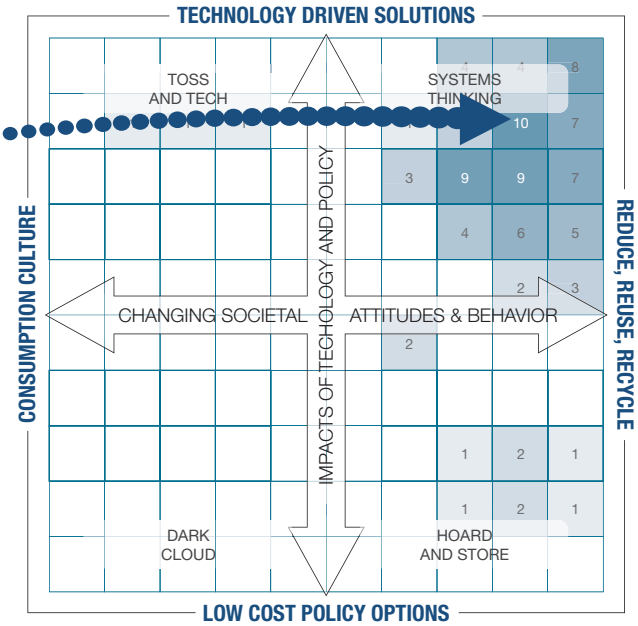
Think-Tank participants discussed the ramifications and implications of failing to achieve the preferred future. There was strong alignment among participants that Scenario B, "Systems Thinking" represented the preferred scenario for Iowa, with a recognition that the transition from integrated solid waste management to sustainable materials management needs to be accelerated in order to avoid long-term and potentially irreversible damage to the planet. This speed of change was deemed possible through the rapid development of technological solutions coupled with effective policy-making.

Iowa Sustainable Materials Management Think-Tank Heatmaps

EXPECTED FUTURE – 2030



PREFERRED FUTURE – 2030



FutureInsight

FUTURE INSIGHTS:

- To achieve the preferred future, Think-Tank participants discussed a 'Complete Streets' approach to waste management. This approach would expand the current boundaries of integrated waste management to address sustainable materials management and the product value chain with its environmental life cycle analysis.
- Reducing consumption through 'sharing' economies supported by technology would be a significant step in the direction of the preferred future for Iowans.

9.0 ACKNOWLEDGEMENTS

The IDNR stakeholders engaged in the Think-Tank workshop and discussions with great enthusiasm. Their passion and interest ensured the discussions were thoughtful, and the outcomes reflective of the State's perspectives. This dedication is reflective of the deep commitment Think-Tank participants have to the future of their communities, local industries, and materials waste management in Iowa.

Future iQ would like to acknowledge the substantial support from IDNR staff. Their outstanding support at the Think-Tank was greatly appreciated.

IDNR Think-Tank Participants

Tom Anderson, IDNR

Mark Armstrong, Container Recovery, Inc.

Mick Barry, Mid America Recycling

Kate Bartelt, Foth*

Kevin Blanshan, Iowa Northland Regional Council of Governments

Shelly Codner, Iowa Waste Exchange

Christine Collier, SCS Engineers**

John Foster, Blackhawk County Solid Waste Management Commission**

Jeff Geerts, Iowa Economic Development Authority

Joe Harms, Perishable Distributors of Iowa

Rick Hunsaker, Region XII Council of Governments

Alex Moon, IDNR

Kathy Morris, Waste Commission of Scott County*

Dan Nickey, Iowa Waste Reduction Center

Ayodeji Oluwalana, Iowa State University**

Susan Robinson, Waste Management

Bill Rowland, Landfill of North Iowa*

Alan Schumacher, Quincy Recycle**

Alicia Vasto, Iowa Environmental Council

Mary Wittry, Carrol County Solid Waste Management Commission*

Jennifer Wright, IDNR

*Represented the Iowa Society of Solid Waste Operations
**Represented the Iowa Recycling Association

10.0 CONTACT DETAILS

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11.0 ABOUT BURNS & MCDONNELL

Burns & McDonnell is a full-service engineering, architecture, construction, environmental and consulting solutions firm, based in Kansas City, Missouri. Our staff of 7,000 includes engineers, architects, construction professionals, planners, estimators, economists, technicians and scientists. Our Solid Waste and Resource Recovery group assists public and private clients throughout North America with one mission in mind: Make our clients successful.

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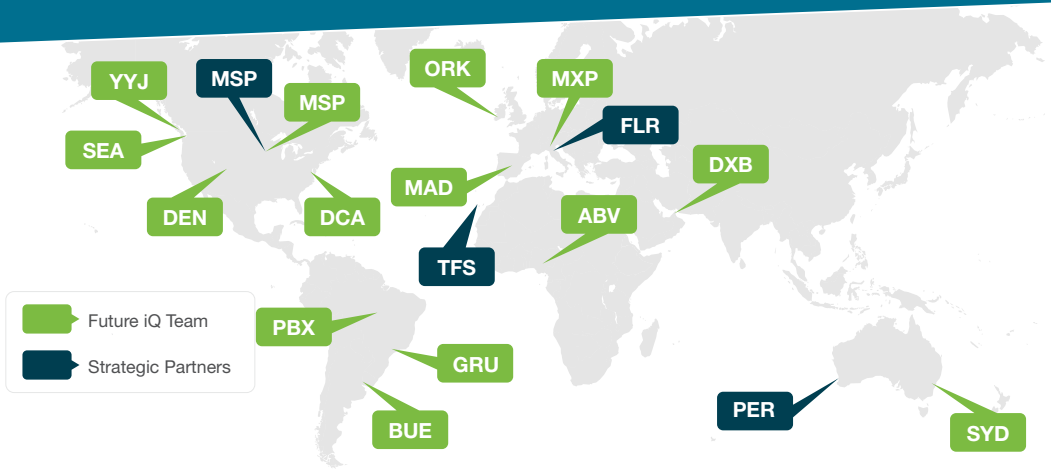

12.0 ABOUT FUTURE IQ

Future iQ specializes in applying innovative tools and approaches to assist municipalities, organizations, regions and industries shape their economic and community futures. With nearly two decades of experience, the company has a global clientele spanning three continents. To learn more about Future iQ, and our recent projects visit **www.future-iq.com** or by email at **info@future-iq.com**

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future→iQ®

Create **Future Intelligence**®

BURNS McDONNELL

DNR IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA SUSTAINABLE MATERIALS MANAGEMENT

STRATEGIC VISION FOR IOWA REPORT

October 2019

Iowa Department of Natural Resources

IOWA SUSTAINABLE MATERIALS MANAGEMENT

STRATEGIC VISION FOR IOWA REPORT

The report has been developed by Future iQ and Burns & McDonnell as part of the development of a vision for the transition from an integrated solid waste management policy to a sustainable materials management policy for the State of Iowa and the Iowa Department of Natural Resources. The strategic vision is based on input from a benchmarking research report, the Iowa DNR Future Think-Tank Workshop, stakeholder surveys, Iowa DNR stakeholder Focus Group meetings and direct input from the (DNR) project steering team.

Report Prepared by:

future→iQ®
Create **Future Intelligence**®

BURNS McDONNELL

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1.0 EXECUTIVE SUMMARY

The 1987 Iowa Groundwater Protection Act and 1989 Iowa Waste Reduction and Recycling Act were enacted to foster the protection of Iowa's human health and environment. Iowa's waste management hierarchy was enacted as part of this legislation and has been used to guide statewide policy making, setting program priorities, developing solid waste comprehensive plans, and providing financial assistance for the last 30 years. The Iowa Department of Natural Resources (DNR) serves as the primary state agency leading program implementation guided by this policy framework.

Iowa's existing solid waste management system focuses primarily on waste discards and how to manage a material at the end of its useful life. However, waste management systems and polices continue to evolve, and sustainable materials management (SMM) approaches are becoming more prevalent. SMM focuses on the best use and management of materials based on how they impact the environment throughout their life cycle.

As a result, the DNR has undertaken a statewide planning process to create a vision to guide Iowa solid waste management policy using SMM as its foundation. The process was initiated with the gathering of input from a broad set of stakeholders through a dynamic planning process. This visioning process used a unique scenario planning methodology to explore future directions and implications. The report that follows provides the outcomes from this process and reflects support from a range of stakeholder interests to develop a clear vision for moving towards a preferred future with SMM.

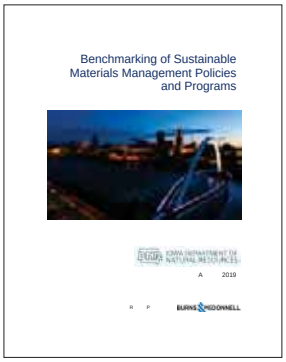
Other states making the transition from integrated solid waste management to sustainable materials management have been challenged to identify a preferred set of metrics for measuring impacts to public health and environment, as well as long-term sustainable funding mechanisms. Iowa's vision for sustainable materials management should address these two key program planning elements as a foundation for moving forward, including proposed policy changes to achieve the sustainable materials management vision.

This report represents the first step in creating a statewide SMM vision and we encourage you to join us in this process to define the solid waste management strategy to better protect Iowa's human health and environment for the future.

Information related to Iowa Sustainable Materials Management – Vision for the Future can be read and downloaded at *www.iowadnr.gov/SMM*.

2.0 INTRODUCTION

Scope of Research



Benchmarking was conducted for a shortlist of state sustainable materials management (SMM) programs and policies. Per feedback from the Iowa Department of Natural Resources (Iowa DNR) project steering team, the following state programs were reviewed in detail to provide insight into their respective visioning processes and outcomes.

- Minnesota
- Vermont
- Maine
- Oregon
- Tennessee

The benchmarking research addressed the following SMM program elements:

- Planning process used by respective states to transition to SMM
- Key SMM principles and objectives
- Statewide SMM policies and programs identified for implementation
- Program funding
- Other relevant details

Based on this research, provided below is a summary matrix highlighting key program elements for each of the respective states, as well as the state of Iowa.

Program Elements Benchmarking Summary

State	Sustainable Materials Planning Document	Material Life Cycle Analysis	Recycling Market Development	Food Waste Management	Sustainable Materials Stakeholder (SMM) Education	Container Deposit Laws	Materials Stewardship
Minnesota	√	√	√	√	√		√
Vermont	√	√	√	√	√	√	√
Maine	√	√		√	√	√	√
Oregon	√	√	√	√	√	√	√
Tennessee	√			√	√		
Iowa				√		√	√

Findings and Conclusions

Upon review of the information gathered during the benchmarking research, provided below are the key finding and conclusions:

- **While the principles of SMM encourage a wholistic approach to materials management, in many instances, statewide SMM programs are still presently linked to waste reduction and diversion goals**. For example, Minnesota and Oregon have identified the need to transition to goals that reflect SMM principles and measure specific environmental impacts. Minnesota has identified the goal to transition to recyclable material capture rates to more efficiently measure and improve upon material recycling rates – but has not yet implemented specific material capture rate goals, standards, or guidance. The state of Oregon has set greenhouse gas emissions goals (GHG), but has not clearly tied those goals to their SMM statewide policy goals and objectives. However, both states are taking steps to transition to SMM metrics by developing more detailed planning documents and commissioning Life Cycle Assessment (LCA) studies to quantify the life cycle impacts of specific products and materials.
- **Respective state funding mechanisms are not likely sustainable in the long-term**. Tipping fee surcharges are still the common revenue source for state waste management programs. This program funding approach is not sustainable over the long term given anticipated increased landfill diversion through SMM policies. Many states have recognized this issue through their planning processes and have begun to actively explore alternative methods of funding for SMM programs.
- **States transitioning to a SMM system prioritize the program strategies of increased organics diversion and fostering materials stewardship**. Organic wastes, specifically food wastes, make up a large percentage of the municipal solid waste stream based on numerous statewide waste characterization studies. By prioritizing organic waste reduction, composting, and energy recovery, states have identified significant SMM benefits including GHG reduction, resource savings, and materials diversion. Materials stewardship strategies are designed to manage the environmental impacts of materials and goods at different stages in their production, use and disposal. Materials stewardship is also based on a shared responsibility by those involved in production, use and disposal. Through shared responsibility, improvements in the protection of public health and the environment can be fairly and economically achieved.

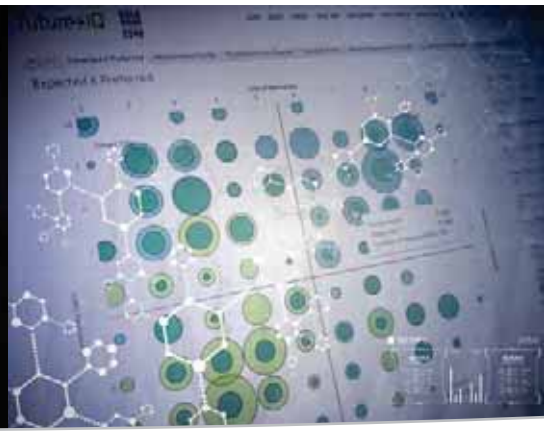
In the face of accelerating speed of change, the key to resiliency is the ability to anticipate change and remain agile. Making the transition from integrated solid waste management to sustainable materials management will require the combined commitment of key Iowa stakeholders.

3.0 OVERVIEW OF FORCES SHAPING THE FUTURE

The Think-Tank Workshop and Focus Groups provided forums for Iowa DNR stakeholders to explore the forces of change shaping the future of Sustainable Materials Management in the State of Iowa. Participants at all three sessions explored four areas of emerging macro trends and forces of change. Perceptions around the nature of impact of these trends, both in terms of size and timing of impact, were explored to gauge how important participants consider the trends. Participants discussed the emerging trends on global, regional and local scales, and related them directly to sustainable materials management in terms of how well prepared they considered the State of Iowa. Specifically, the trend areas were:

- Demographics, population and mass urbanization
- Changing macro-economics and societal values
- Energy, food, water and changing climate
- Technology, and the next industrial revolution

Of particular relevance to the discussion on trends is the speed and scale of change occurring. Newly developed innovations are being implemented globally and locally at all scales, thereby changing the face of industries and society in a rapid and profound way. Manufacturing is at the forefront of this transformation, but other industries are also quickly developing such as agriculture, health care, biomedical research, infrastructure, energy, transportation and mobility, shipping and logistics, food services, hospitality, financial services, and retail.



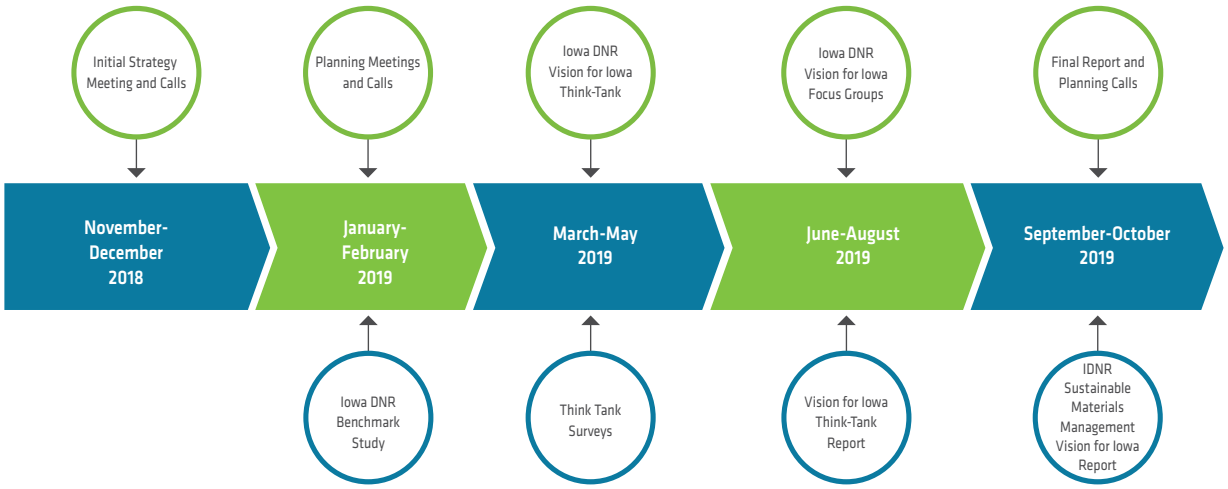
4.0 SUMMARY OF ENGAGEMENT PROCESS AND TIMELINE

The Iowa DNR's Phase 1 visioning process took place from November 2018 to September 2019. In order to build a comprehensive vision for sustainable materials management that is supported by Iowa stakeholders and Iowa DNR leadership, the Iowa DNR embarked on a participatory engagement planning process involving planning meetings, an online Think-Tank survey, a Think-Tank workshop, a Focus Group survey, two state-wide stakeholder focus group meetings, a state-wide public vision survey and meetings with the Iowa DNR steering team. This engagement was intended to create a vision that would establish the foundation of support upon which more targeted planning could be developed to guide the Iowa DNR into Phase 2 of this project.

The engagement process involved many hours of Iowa DNR staff and stakeholder time and commitment to planning for the future of sustainable materials management in Iowa.

Three reports have been prepared as part of the Sustainable Materials Management – Vision for Iowa visioning process and may be downloaded at: *https://www.iowadnr.gov/SMM*

IDNR Sustainable Materials Management – Vision for Iowa Timeline (Phase 1)



FutureInsight

FUTURE INSIGHT:

- The success of the Iowa DNR's visioning will be dependent on continued strong Iowa DNR leadership with significant stakeholder and public policy support in its implementation.
- The aim of Iowa DNR's vision for sustainable materials management will serve as a guide for future sustainable materials management related actions.

The messaging surrounding the importance of making the transition from integrated solid waste management to sustainable materials management will be critical in gaining public support for necessary policy changes.

5.0 CREATING SHARED VISION AND DIRECTION

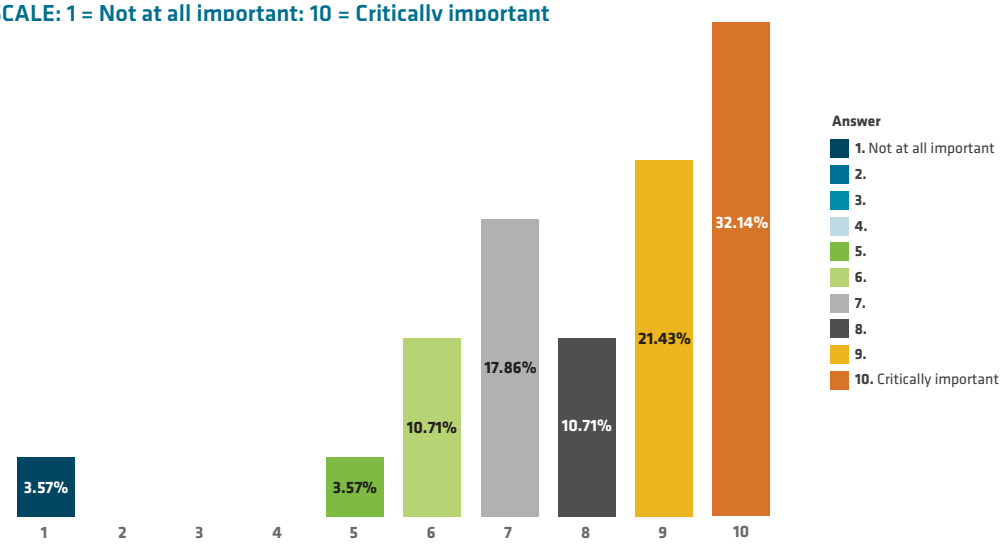
5.1 TRANSITIONING TO SUSTAINABLE MATERIALS MANAGEMENT

The 1987 Iowa Groundwater Protection Act and the 1989 Waste Volume Reduction and Recycling Act put into motion significant changes to policy directions concerning issues and opportunities in solid waste management in Iowa. Most significantly, these key pieces of legislation serve as a framework for integrated solid waste management which is the basis for Iowa solid waste management today. The primary purpose for these legislative actions was protecting human health and the environment.

5.1.1 IMPORTANCE OF THE TRANSITION

The initial survey sent to Think-Tank participants included a question about the importance of the transition from an integrated solid waste management policy to a sustainable materials management policy approach. The vast majority of Think-Tank participants considered the transition important to critically important.

How important do you think it is for Iowa to transition from an integrated solid waste management policy to a sustainable materials management policy? (Aiming for the highest and best use of discarded materials and improved environmental protection). SCALE: 1 = Not at all important; 10 = Critically important



DataInsight

DATA INSIGHTS:

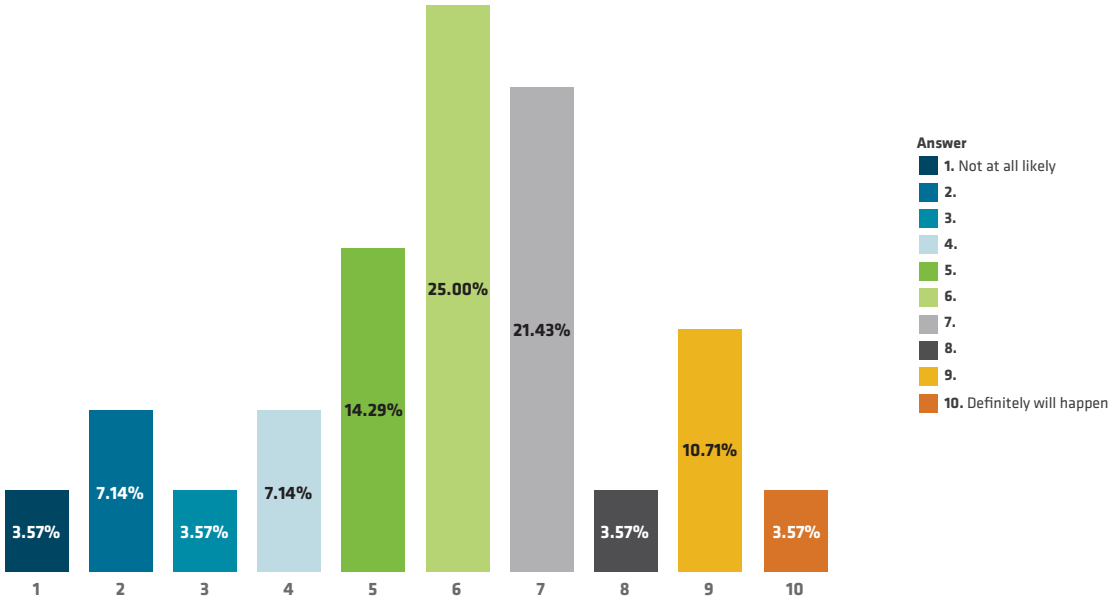
- Consistent advocacy for policy change at the legislative level will be necessary to move from integrated solid waste management to sustainable materials management in the State of Iowa.
- The key to the transition from integrated solid waste management to sustainable materials management will be the long-term sustainability of the required changes.

The timely transition from integrated solid waste management to sustainable materials management will be critical in the Iowa DNR's goal of the highest and best use of discarded materials and improved environmental protection.

5.1.2 PREFERRED TIMING OF THE TRANSITION

To determine when the transition from waste management to sustainable materials management should take place, Think-Tank survey participants were asked how likely the transition would occur in the near future. The majority of respondents leaned towards the definite possibility that it would happen, however a third of respondents questioned the speed of the transition.

How likely do you think there will be a transition from an integrated solid waste management policy approach to a sustainable materials management policy approach in the near future? (Move to aiming for the highest and best use of discarded materials and improved environmental protection) SCALE: 1 = Not at all likely; 10 = Definitely will happen



DataInsight

DATA INSIGHTS:

- The transition from integrated solid waste management to sustainable materials management will take time and require significant support and collaboration.
- Given participants' views about the anticipated timing of the transition, the Iowa DNR, private sector business and industry and the Iowa legislature will need to take a proactive leadership position with respect to the State's transition from integrated solid waste management to a sustainable materials management approach.

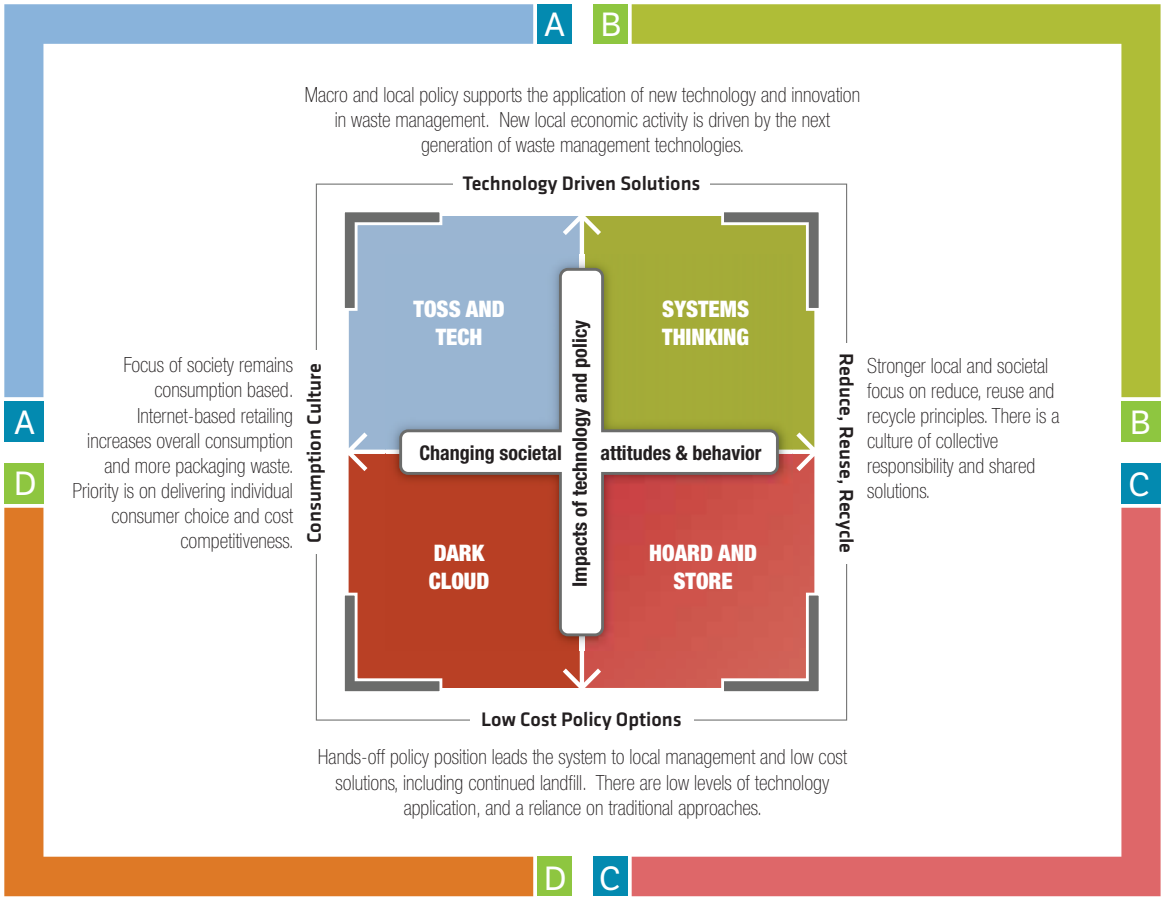
FUTURE-SPLITTING QUESTIONS™

The scenario-planning process provides a way to tease out plausible future scenarios and examine them from a speculative standpoint. They represent different possibilities for the future.

5.2 SCENARIO FRAMEWORK AND DATA VISUALIZATION

The visioning process used a unique scenario planning methodology to explore future directions and implications. This approach helps stakeholders understand the full range of impacts and consequences of various decisions as they seek a preferred future.

The following diagram was developed with Iowa DNR stakeholders at the May 2019 Think-Tank. The scenario planning process creates four plausible versions of the future, built around the main themes of 'Changing societal attitudes and behavior' and 'Impact of technology and policy'. The process allows stakeholders to think about the future in a multidimensional manner. More detail on the process is available in the Iowa Sustainable Materials Management Vision for Iowa Think-Tank Report, May 2019. For more information, visit: *https://www.iowadnr.gov/SMM*.



Think-Tank participants showed high levels of agreement around the preferred future. The preferred future showed a significant appetite for change to pivot away from the expected future.

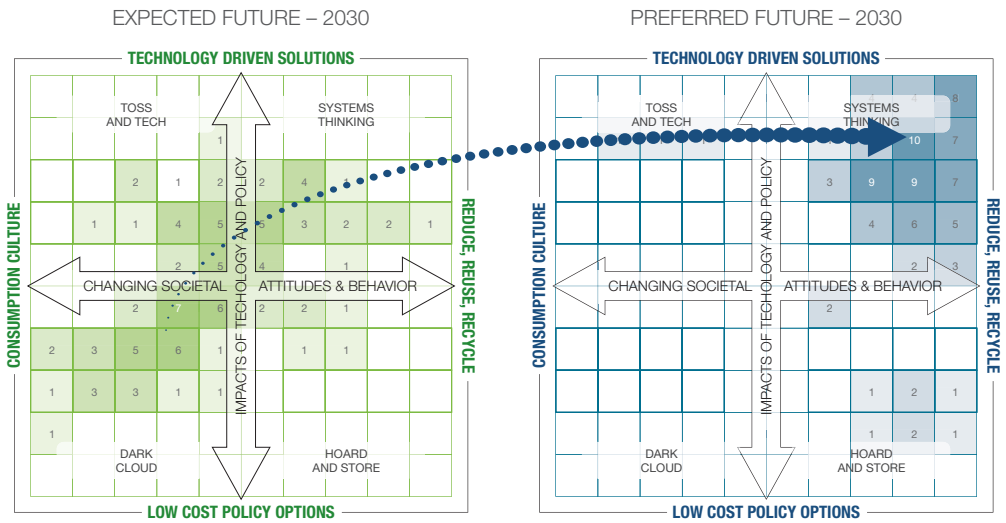
5.3 ALIGNMENT AROUND THE PREFERRED FUTURE

Think-Tank and Focus Group participants were both asked to engage in plausibility mapping around expected and preferred futures. The expected future is one deemed most likely to happen if there is no change in the current trajectory of waste management in Iowa. The preferred future is the type of future participants ideally want to see happen recognizing that most often steps will be needed to get there. There was strong alignment among both Think-Tank and Focus Group participants on expected and preferred futures.

5.3.1 THINK-TANK ALIGNMENT

Think-Tank participants discussed the ramifications and implications of failing to achieve the preferred future. Most of the participants agreed that Scenario D, "Dark Cloud", is the scenario they believe represented the expected future for Iowa waste management if no critical policy changes were made. There was strong alignment among participants that Scenario B, "Systems Thinking" represented the preferred scenario for Iowa, with a recognition that the transition from integrated solid waste management to sustainable materials management needs to be accelerated in order to avoid long-term and potentially irreversible damage to the environment.

Iowa Sustainable Materials Management Think-Tank Heatmaps



DataInsight

FUTURE INSIGHTS:

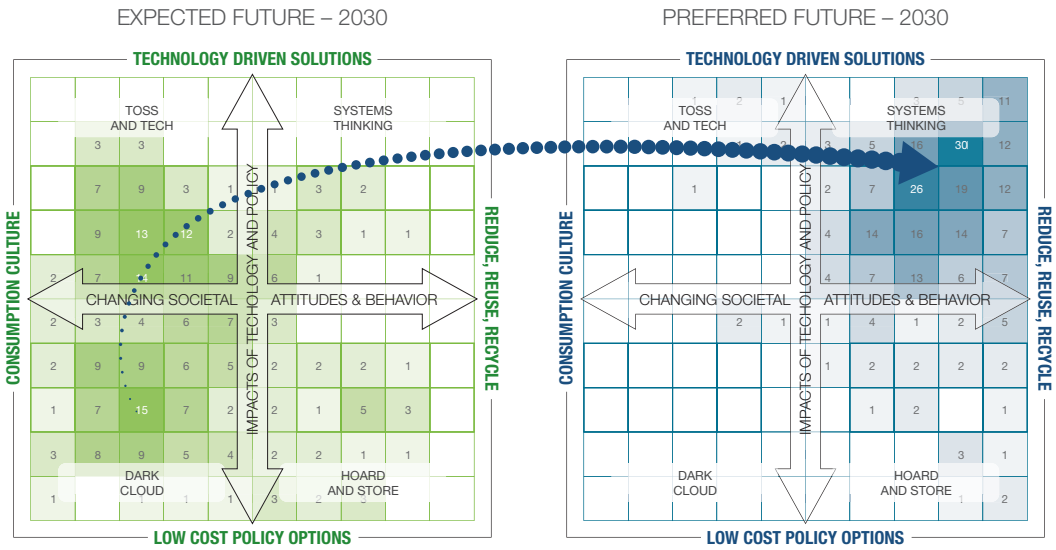
- To achieve the preferred future, Think-Tank participants discussed an all encompassing approach to waste management. This approach would expand the current boundaries of integrated waste management to address sustainable materials management and the product value chain with its environmental life cycle analysis.
- Reducing consumption through 'sharing' economies reuse and repair supported by technology would be a key step in the direction of the preferred future for Iowans.

Focus Group participants validated the Think-Tank results with a high level of responses in the 'Systems Thinking' scenario future.

5.3.2 FOCUS GROUP ALIGNMENT

In early August 2019, participants from two Iowa DNR stakeholder Focus Groups also discussed expected and preferred futures for sustainable materials management in Iowa. Focus Group participants were relatively evenly split between Scenarios A (Toss and Tech) and D (Dark Cloud) as the expected future for Iowa. Among Focus Group participants, there was a more optimistic view that Iowa would inevitably adopt new technologies over time and that accounted for the variation in thinking about expected futures between the Think-Tank and Focus Group participants. Like the Think-Tank participants, there was strong alignment among Focus Group participants that Scenario B, "Systems Thinking" represented the preferred future for Iowa. The speed of change required to achieve the preferred future was deemed possible through rapid industry development of technological solutions for sustainable materials management.

IOWA SUSTAINABLE MATERIALS MANAGEMENT
COMBINED FOCUS GROUP HEATMAPS



Below are samples of Focus Group participant survey comments and ideas on making the transition to sustainable materials management:

- *"We are at a crossroads, the urgency is real and the clock is loudly ticking."*
- *"Think importance of space program to sustainable technology."*
- *"Priorities need to shift."*
- *"Recycling has to be easier for the consumer."*
- *"Thank you, DNR, for leading the change on this."*

Education to change attitudes will play a key role in gaining support for the transition from integrated solid waste management to sustainable materials management in the State of Iowa.

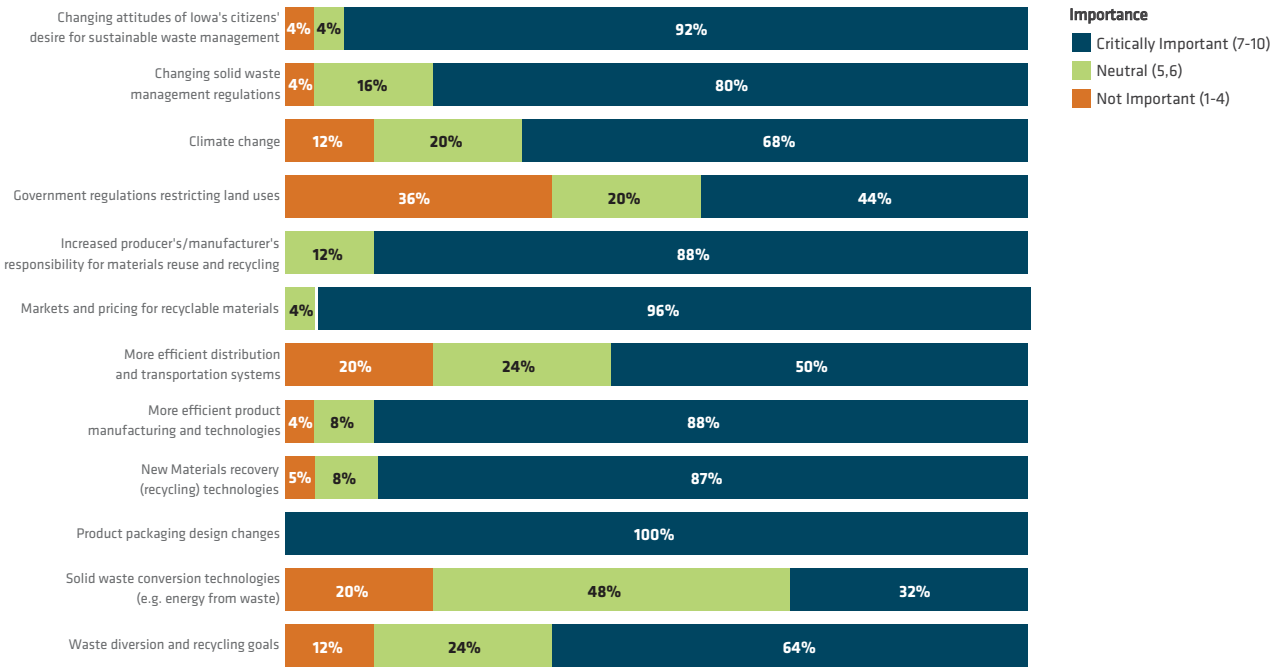
5.4 DRIVERS OF CHANGE ANALYSIS

To analyze perceived drivers and potential influences on waste management in Iowa, Think-Tank survey participants were asked about the importance of changes in some topic areas over time, as well as Iowa's performance in addressing these drivers of change. Results from a combination of the two responses are also provided below.

5.4.1 IMPORTANCE OF DRIVERS OF CHANGE

To gauge the importance of the inevitable impact of changes over time, Think-Tank survey respondents were asked how important changes in the following issues and sectors will be to waste management in Iowa.

For the following 'drivers of change', how important you think they are in shaping the future of waste management in Iowa?
SCALE: 1 = Not at all important; 10 = Critically important



DataInsight

DATA INSIGHTS:

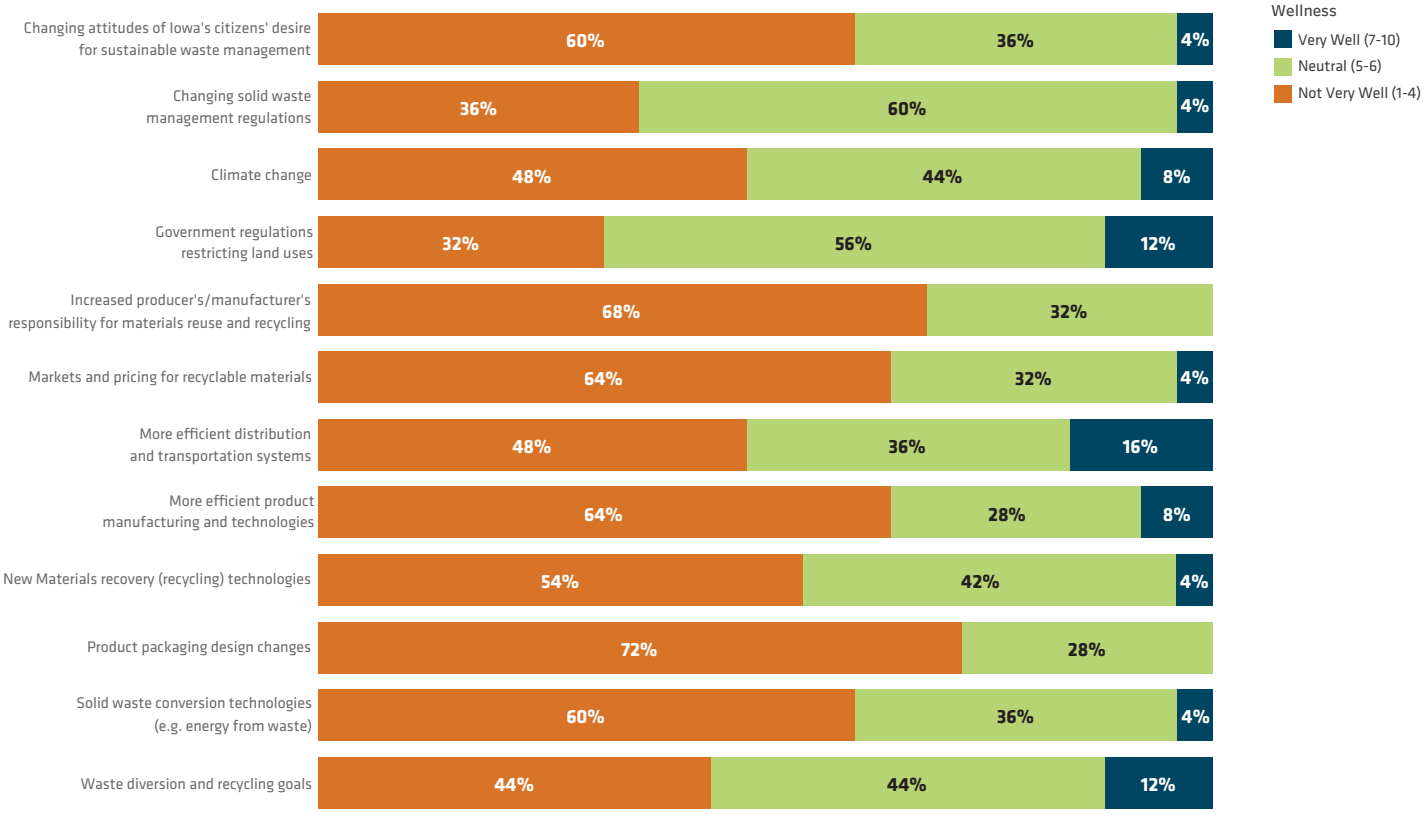
- Survey respondents considered markets and pricing for recyclable materials and product packaging design changes as the most important drivers of change in shaping the future of waste management in Iowa.
- Acknowledgement that implementing priority drivers of change will not diminish the valuable service landfills provide in protecting public health and the environment.

Think-Tank survey respondents did not rate Iowa's performance on the given drivers of change very well.

5.4.2 IOWA'S PERFORMANCE IN ADDRESSING DRIVERS OF CHANGE

To assess how well the State of Iowa is addressing drivers of change, Think-Tank survey respondents were asked to rate the State's performance. Below are the results.

How well is Iowa currently addressing the following 'drivers of change'? SCALE: 1 = Not very well; 10 = Very well



DataInsight

DATA INSIGHTS:

- Iowa was considered by survey respondents to not perform well in several areas with the poorest performance in the areas of product packaging design changes and increasing producers'/manufacturers' role for materials reuse and recycling.
- Consumer and producer education will play a key role in helping the State of Iowa make the transition from integrated solid waste management to sustainable materials management.
- Legislative support is critical to the transition toward sustainable materials management as the policy of the State of Iowa.

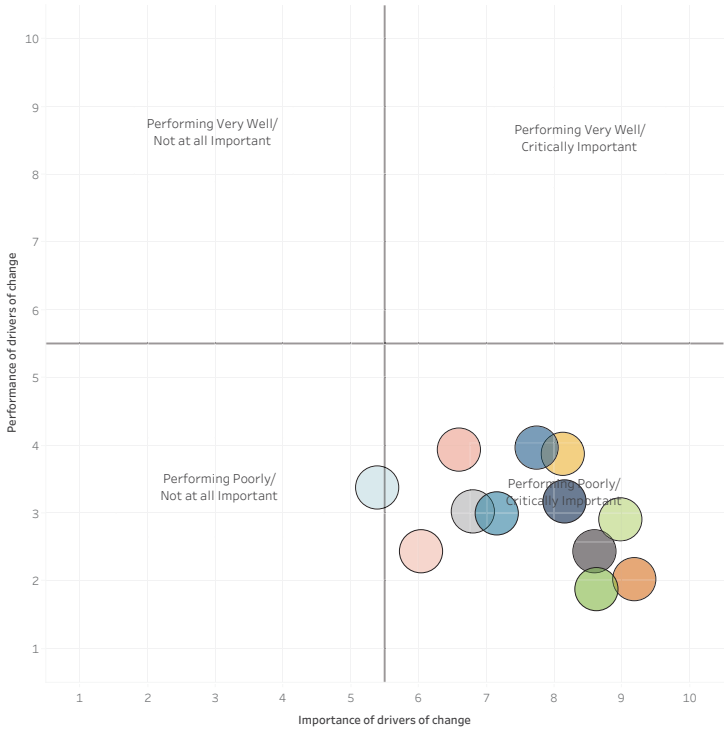
Iowa's poorly rated performance on the drivers of change by Think-Tank respondents gives DNR leadership and Iowa policy makers a mandate for change.

5.4.3 COMBINED IMPORTANCE OF DRIVERS OF CHANGE AND IOWA'S PERFORMANCE

In order to get a sense of how Think-Tank participants looked at both the importance of the given drivers of change and Iowa's performance on them, this analysis combines the two questions to create a scatter plot. The data visualization shows the response data as it relates to all 12 drivers. The chart presents the average results based on all responses.

The X-axis is the response to the question: 'For the following drivers of change, how important do you think they are in shaping the future of waste management in Iowa?'

The Y-axis is the response to the question 'How well is Iowa currently addressing the following drivers of change?' Scale 1=Not very well, 10=Very well



DataInsight

DATA INSIGHTS:

- Almost all of the responses are grouped in the quadrant that is broadly defined as 'Important and Not Performing Well'. This outcome reflects key stakeholders' perspective that Iowa needs to better understand how drivers of change influence future policy.
- The drivers were all assessed as important, with some such as Product Design and Packaging considered as Critically Important. Thus, key stakeholders consider the transition to Sustainable Materials Management requiring the navigating of a complex pathway.

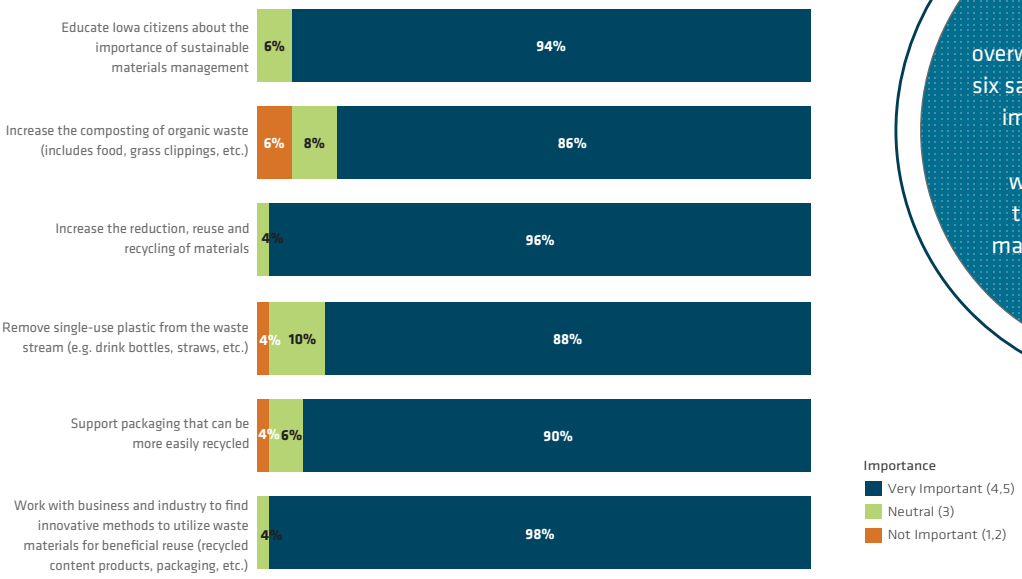
5.5 APPETITE FOR CHANGE TO SUSTAINABLE MATERIALS MANAGEMENT

Following the Think-Tank, information from the benchmark research, Think-Tank surveys, Think-Tank input and Iowa DNR staff input was compiled to create a new survey for the Focus Group participants. The purpose of the survey was to ascertain appetite for change and potential ideas and approaches that could be taken to make the transition from an integrated solid waste management policy to a sustainable materials management policy in Iowa. To explore the types of strategies that may be developed to achieve the transition, six sample approaches were used to test appetite for change and direction. Below are the results.

5.5.1 APPROACH

To gauge whether the six sample approaches were viable, Focus Group participants were asked to rate how important they thought each approach is to support the transition from an integrated solid waste management policy to a sustainable materials management policy in Iowa. All of the approaches were considered very important.

How important do you think the following approaches are for Sustainable Materials Management in Iowa?
SCALE: 1 = Not at all important; 5 = Critically important



Focus Group participants overwhelmingly considered all six sample approaches as very important to the transition from an integrated solid waste management policy to a sustainable materials management policy in Iowa.

FutureInsight

FUTURE INSIGHTS

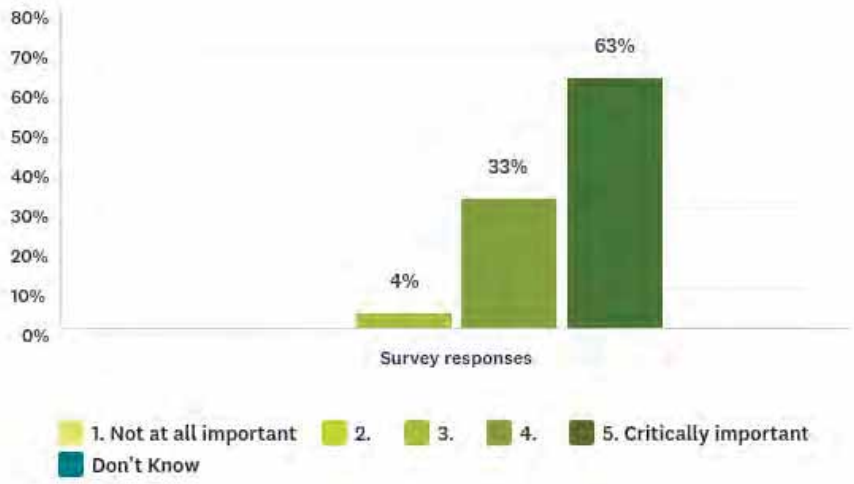
- As noted in the benchmark report, States transitioning to sustainable materials management prioritize organics diversion and materials stewardship.
- The principles of sustainable materials management encourage a wholistic approach, including the role of landfills, to goal setting in the development of strategies to achieve the transition from waste management.

5.5.2 LONG-TERM VISION

Making the transition to a sustainable materials management will take time. Understanding that both Think-Tank and Focus Group participants consider Scenario B, 'Systems Thinking', as the preferred future for sustainable materials management in Iowa, Focus Group participants were also asked about the importance of having a long-term vision to achieve the preferred future. The vast majority of Focus Group respondents considered a long-term vision very important to critically important.

Both Think-Tank and Focus Group participants were emphatic about their support of transitioning to a 'Systems Thinking' scenario as the preferred future for Iowa.

How important do you think it is to have a long-term vision and commitment for Sustainable Materials Management in Iowa? SCALE: 1 = Not at all important; 5 = Critically Important



FutureInsight

FUTURE INSIGHTS

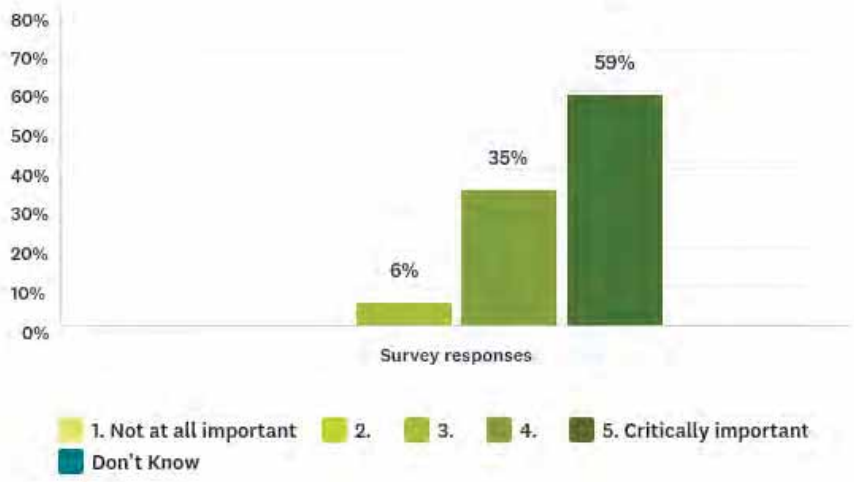
- A shared vision was identified as very important by over 95% of Focus Group participants. This points to a strong preference to collaborate on strategies to transition to sustainable materials management in Iowa.
- The high level of agreement on the importance of aligning perspectives and striving for a long-term vision for sustainable materials management will help design a new system through collaboration, understanding issues, conducting life cycle analysis on key materials and products to develop a clear picture of the most appropriate way to manage a waste protecting human health and the environment.

This visioning process has highlighted the importance of the need to transition from an integrated waste management policy to a sustainable materials management policy in the State of Iowa.

5.5.3 TRANSITION

Early in the visioning process, Think-Tank participants were asked about the importance of the transition from an integrated solid waste management policy to a sustainable materials management policy approach. The vast majority of Think-Tank participants considered the transition important to critically important. Focus Group participants were also asked how important they considered the transition. Again, the vast majority of Focus Group respondents considered the transition very important to critically important.

How important do you think it is for Iowa to transition from managing waste at the point of disposal to a sustainable materials management policy? (Using and reusing materials in the most productive and sustainable ways, to minimize materials use and related environmental impacts.) SCALE: 1 = Not at all important; 5 = Critically Important



FutureInsight

FUTURE INSIGHTS

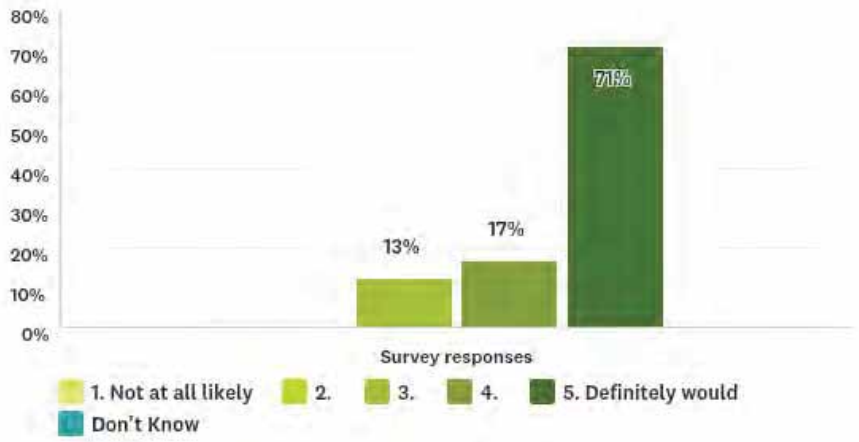
- The importance of the transition from an integrated waste management policy to a sustainable materials management policy was considered very important to critically important by 94% of all Focus Group participants. This gives the Iowa DNR a clear directive to pursue this transition.
- Given the gap between expected and preferred futures, increasing awareness and understanding by consumers, producers and legislators of the importance and benefits of managing materials to better protect human health and the environment in order to achieve the transition.

5.5.4 WILLINGNESS TO PAY

One measure of appetite for change is the willingness of consumers and taxpayers to pay for change. Focus Group participants were asked "how willing are the stakeholders to pay more to support a transition to sustainable materials management." Focus Group participants overwhelmingly considered themselves more willing to pay for change. The state of Iowa may choose an approach that includes a redistribution of the current program funds to make the transition to sustainable materials management.

The transition from an integrated solid waste management to a sustainable materials management policy may require all generators of waste to help pay for the transition.

Iowa DNR Stakeholders: Would YOU be willing to pay more to support a sustainable and environmentally protective approach to waste management in Iowa? SCALE: 1 = Not at all likely; 5 = Definitely would



FutureInsight

FUTURE INSIGHTS

- Iowa DNR stakeholder willingness to pay for the transition to a sustainable materials management policy models the leadership that will be required to implement the transition.
- Funding mechanisms, including the potential redistribution of existing program funds, have been identified as a critical area for development to support a long-term sustainable materials management policy.

The visioning process offers initial direction on setting priorities for developing strategies to get to the preferred future for sustainable materials management in Iowa.

5.6 PRIORITIZING STRATEGIES

5.6.1 FOCUS GROUPS

As an exercise to explore how Focus Group participants would prioritize six potential strategies to sustainable materials management, participants were asked to apply ten dots of two colors to a chart listing the approaches over two timeframes. These strategies represented a mix of stakeholder education, collaboration with key stakeholders, and policy incentives/mandates. Participants were instructed to place one color in years 1-5 and the other in years 6-10, with the intent to show which approaches should be prioritized over the next 10 years. Below are the prioritized results.

Cedar Rapids Focus Group, 7 August 2019

Approach/Timeframe	1-5 Years	6-10 Years	Totals
Remove single-use plastic from the waste stream (e.g. drink bottles, straws, etc.)	14	9	23
Increase the composting of organic waste (Includes food, grass clippings, etc.)	12	10	22
Support packaging that can be more easily recycled	2	9	11
Increase the reduction, reuse and recycling of materials	12	13	25
Work with businesses and industry to find innovative methods to utilize waste materials for beneficial reuse	12	17	29
Educate Iowa citizens about the importance of sustainable materials management	13	6	19

Des Moines Focus Group, 8 August 2019

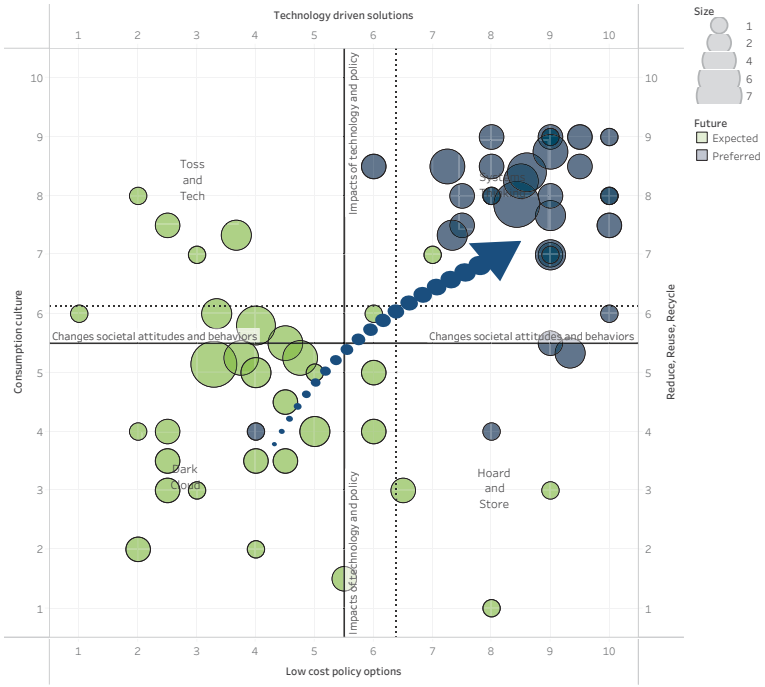
Approach/Timeframe	1-5 Years	6-10 Years	Totals
Remove single-use plastic from the waste stream (e.g. drink bottles, straws, etc.)	16	6	22
Increase the composting of organic waste (Includes food, grass clippings, etc.)	23	21	44
Support packaging that can be more easily recycled	2	19	21
Increase the reduction, reuse and recycling of materials	8	9	17
Work with businesses and industry to find innovative methods to utilize waste materials for beneficial reuse	18	17	33
Educate Iowa citizens about the importance of sustainable materials management	16	11	27

Closing the gap between the expected and preferred futures for Iowa materials management will require deliberate public policy action.

5.6.2 SUMMARY

The Iowa DNR Iowa Sustainable Materials Management Vision for Iowa visioning process has provided a clear mandate for a transition from integrated solid waste management to sustainable materials management in the State of Iowa. The gap between expected and preferred futures as illustrated in the stakeholder data visualization below indicate a definite need for change in strategy and public policy. It should be noted that the sample strategies explored to move in the direction of this change are not exclusive but may be used to form the basis for next steps in the transitioning process.

From Expected to Preferred Future



FutureInsight

FUTURE INSIGHTS

- Policy development to achieve the preferred future for Iowa sustainable materials management will require a shift in both societal attitudes and behaviors, as well as an increased use of technology driven solutions and recognition of the health and environmental impacts of the status quo.
- The long-term success of the transition from an integrated solid waste policy to a sustainable materials management policy will be dependent on building strong collaboration among all stakeholders, including consumers, producers, private industry, and all waste generators.
- Short and long-term success will be dependent on a sustainable funding source(s) to implement sustainable materials management programs, develop appropriate infrastructure and to provide incentives and financial assistance to manage materials in the most impactful and sustainable manner.

6.0 RECOMMENDATIONS

A combination of education, collaboration, incentives, innovation, and legislative policy initiatives are recommended to support the transition to sustainable materials management in Iowa.

6.1 VISION FRAMEWORK

The Sustainable Materials Management planning process reflects support from a range of stakeholder interests to develop a clear vision for moving towards a preferred future. The preferred future should include both fostering a change in societal attitudes and behaviors related to waste and materials management accompanied by increased use of technology driven solutions.

Other states making the transition from integrated solid waste management to sustainable materials management have been challenged to identify a preferred set of metrics for measuring impacts to public health and the environment and long-term sustainable funding mechanisms. Iowa's vision for sustainable materials management should address these two key program planning elements as a foundation for moving forward including proposed policy changes to achieve the sustainable materials management vision.

It is recommended the strategies to support the sustainable materials management vision and respective program goals be based in a combination of education, collaboration, funding, innovation, and legislative policy initiatives. A number of tools are needed to effectively make this transition to sustainable materials management. The process will be an incremental one, but a clear understanding of the preferred future will enhance the likelihood of success.

6.2 NEXT STEPS

The visioning process for Iowa's sustainable materials management outlines the basis for policy direction; next steps will require collaborative strategic planning to make this vision a reality.

Based on the outcomes of Sustainable Materials Management – Vision for Iowa, Phase 1 planning process, the following next steps are recommended:

1. Solicit input and feedback from the general public as part of the planning process.
2. Use the deliverables from Phase 1 to inform and educate key legislators and associated staff about the importance of Iowa's vision to transition to sustainable materials management.
3. Establish a roundtable with environmental agency representatives from select states making the transition to sustainable materials management as a forum to discuss critical transition issues (e.g. metrics, funding) and lessons learned.
4. Reconvene the Think-Tank to review the results from the stakeholder meetings and identify a shortlist of strategies for more detailed evaluation and strategy development.
5. Upon identifying the shortlist of preferred strategies, establish a set of working committees composed of applicable stakeholder representatives to develop a description of each strategy, applicable actions, timeline, and responsible parties to formulate a specific roadmap for Iowa to transition to sustainable materials management.

7.0 ACKNOWLEDGEMENTS

The IDNR stakeholders engaged in the Think-Tank workshop and focus group discussions with great enthusiasm. Their passion and interest ensured the discussions were thoughtful, and the outcomes reflective of the State's perspectives. This dedication is reflective of the deep commitment all participants have to the future of their communities, local industries, and sustainable materials management in Iowa.

Future iQ and Burns & McDonnell would like to acknowledge the substantial support from IDNR staff. Their outstanding support throughout the project was greatly appreciated. Thank you also to the Iowa Society of Solid Waste Operations (ISOSWO) for providing food and refreshments for the Think-Tank and stakeholder meeting participants.

IDNR Think-Tank and Focus Group Participants

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Paul Ebert, Des Moines Wastewater Reclamation Authority

Jason Evans, Cedar Rapids/Linn Co. Solid Waste Agency

Sarah Fersdahl, DuPont BioSciences

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Joe Harms, Perishable Distributors of Iowa

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Mike Miller, SCS Engineers

Ciji Mitrisin, Recycle Me Iowa

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Alicia Presto, Iowa Waste Exchange

Merry Rankin, Iowa State University

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Bill Schmitt, City of Ames Resource Recovery Center

Alan Schumacher, Quincy Recycling

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Alicia Simmons, Frontier Co-Op

Lee Sorenson, Dickinson County CCB

Kevin Techau, Keep Iowa Beautiful

Bev Wagner, Dubuque Metropolitan Area SWA/Loras College

Jane Wilch, City of Iowa City

Troy Willard, The Can Shed

Jennifer Wittenburg, Iowa Waste Reduction Center

Mike Zeigler, City of Ames, Electric Services Operations

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9.0 ABOUT BURNS & MCDONNELL

Burns & McDonnell is a full-service engineering, architecture, construction, environmental and consulting solutions firm, based in Kansas City, Missouri. Our staff of 7,000 includes engineers, architects, construction professionals, planners, estimators, economists, technicians and scientists. Our Solid Waste and Resource Recovery group assists public and private clients throughout North America with one mission in mind: Make our clients successful.

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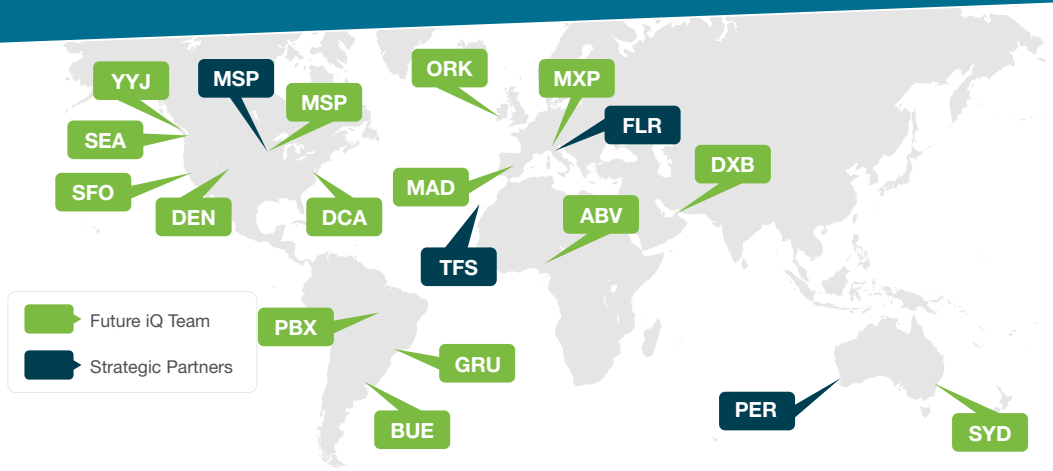


10.0 ABOUT FUTURE IQ

Future iQ specializes in applying innovative tools and approaches to assist municipalities, organizations, regions and industries shape their economic and community futures. With nearly two decades of experience, the company has a global clientele spanning three continents. To learn more about Future iQ, and our recent projects visit **www.future-iq.com** or by email at **info@future-iq.com**

WORKSHOP, FOCUS GROUPS AND REPORTS PREPARED BY:

David Beurle

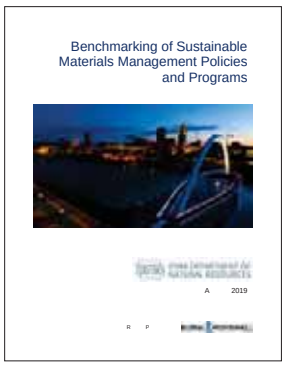
CEO, Future iQ

Heather Branigin

VP, Foresight Research

To access the Think-Tank and Strategic Vision reports, please visit:

https://iowadnr.gov/SMM



Benchmarking of Sustainable Materials Management Policies And Programs

April 2019

Vision for Iowa Think-Tank Report

August 2019

Iowa DNR Strategic Vision Report

October 2019

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DNR IOWA DEPARTMENT OF NATURAL RESOURCES

Life Cycle Assessment

Life Cycle Assessment (LCA) aims to quantify the environmental impacts that arise from material inputs and outputs, such as energy use or air emissions, over a product's entire life cycle to assist consumers in making decisions that will benefit the environment. LCA is typically a "cradle-to-grave" approach, which begins with the gathering of raw materials from the earth to create the product and ends at the point when all materials are returned to the earth.

The goal of LCA is to:

- Quantify or otherwise characterize all the inputs and outputs over a product's life cycle
- Specify the potential environmental impacts of these material flows
- Consider alternative approaches that change those impacts for the better

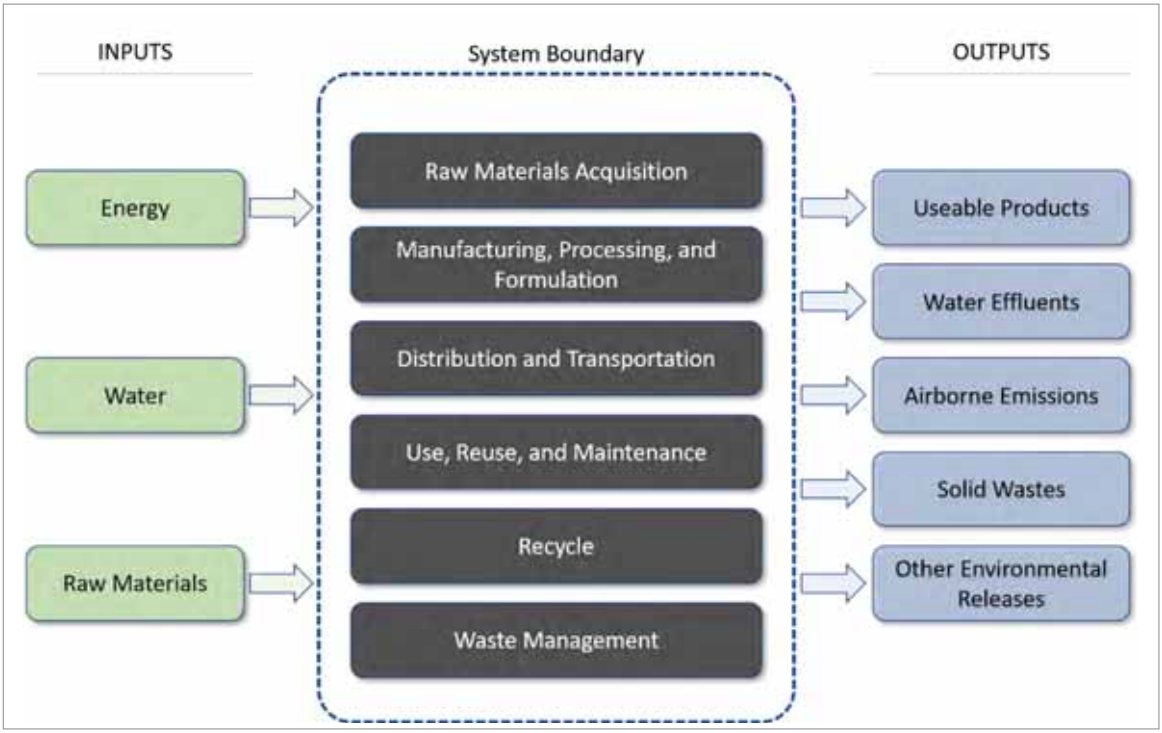


Figure 1: Inputs and outputs over a product's life cycle

It is important to take into consideration the entire life cycle of materials, systems, and the whole building when making design or purchasing decisions.

Benefits of LCA	
Provide comprehensive view of the environmental impacts	See more than just the "use" phase
Quantify environmental effects such as overall energy consumption or air emissions	Recognize inefficiencies or significant changes across life cycle phases
Allow comparison of alternatives "apples to apples"	Reduce overall environmental impact and costs (as in an economic input-output LCA)

Challenges with LCA	
Defining LCA boundaries and scope	Where do I want to draw the line? What attributes am I interested in comparing against one another? How far down the chain do I want to identify and quantify these material flows, and is that data even available?
Data availability	Is data available to quantify material inputs and outputs at all stages of my defined scope? Is this data from a reliable source (e.g., manufacturer)?
Quantifying environmental impacts	How can these material flows be quantified into environmental categories (e.g., global warming)?
Weighting impacts across stakeholders	What environmental category are we most concerned about (e.g., global warming, energy use, acidification) and how does it compare to other environmental attributes?

Source: U.S. General Services Administration Sustainable Facilities Tool: https://sftool.gov/plan/400/life-cycle-assessment

ATTACHMENT D

MATERIAL CATEGORY PRIORITIZATION DISCUSSION BOARDS AND RESULTS

Breakout Room #1 - Material Category Priority Results

Category Criteria:

- Phase I Recommendation
- Environmental Benefits
- % of Disposed Waste Stream
- Feasibility for Implementation

High Priority

- Organics
- Fibers
- Plastics
- C&D
- Durable Goods

- Renewable Energy Equipment - Middle
- Universal Waste & HHM - Middle

Low Priority

- Glass
- Metals

Breakout Room #2 - Material Category Priority Results

Category Criteria:

- Phase I Recommendation
- Environmental Benefits
- % of Disposed Waste Stream
- Feasibility for Implementation

High Priority

- Renewable Energy Equipment
- Universal Waste & HHM
- Plastics
- C&D
- Organics

- Glass
- Fibers
- Durable Goods

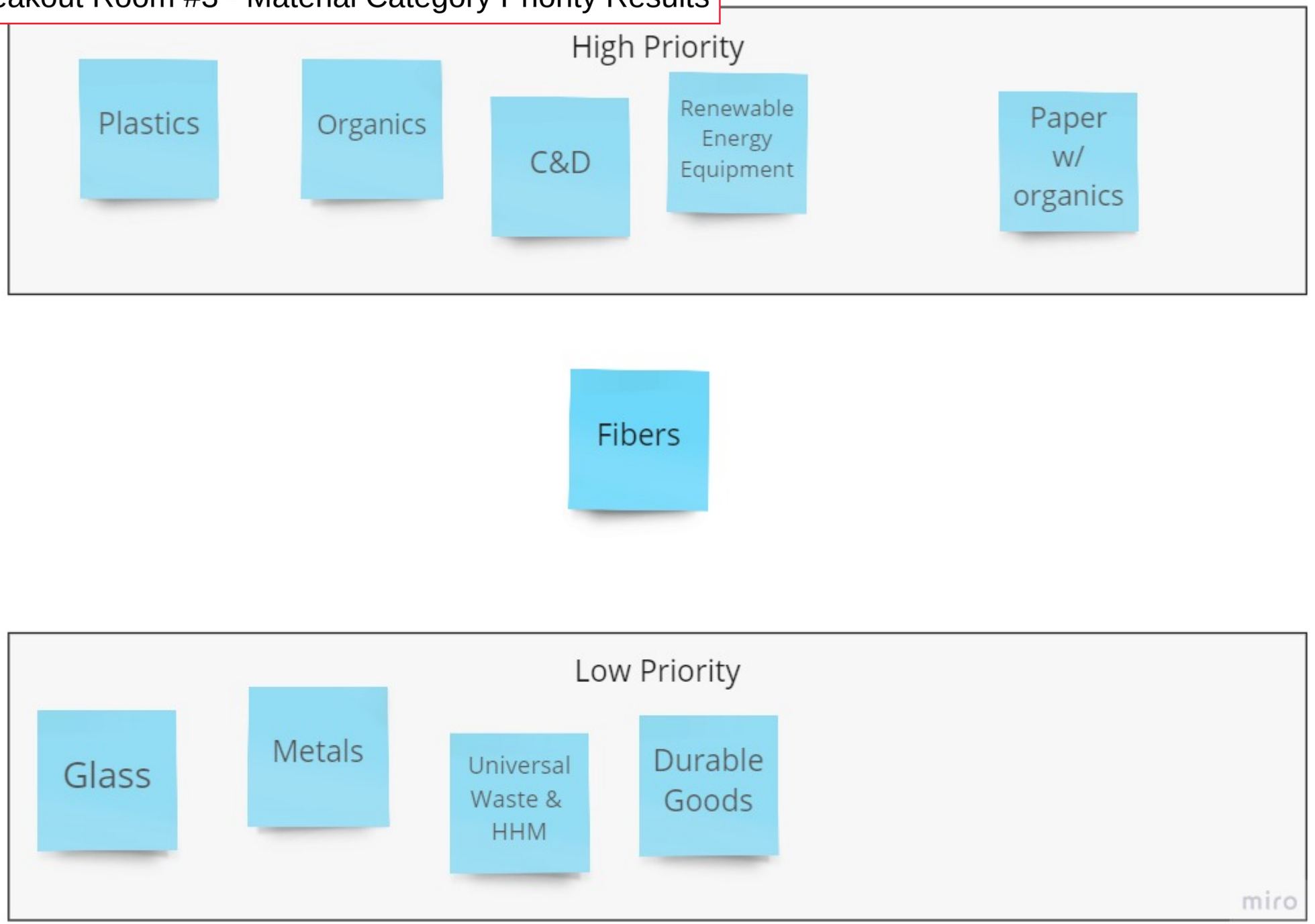
Low Priority

- Metals

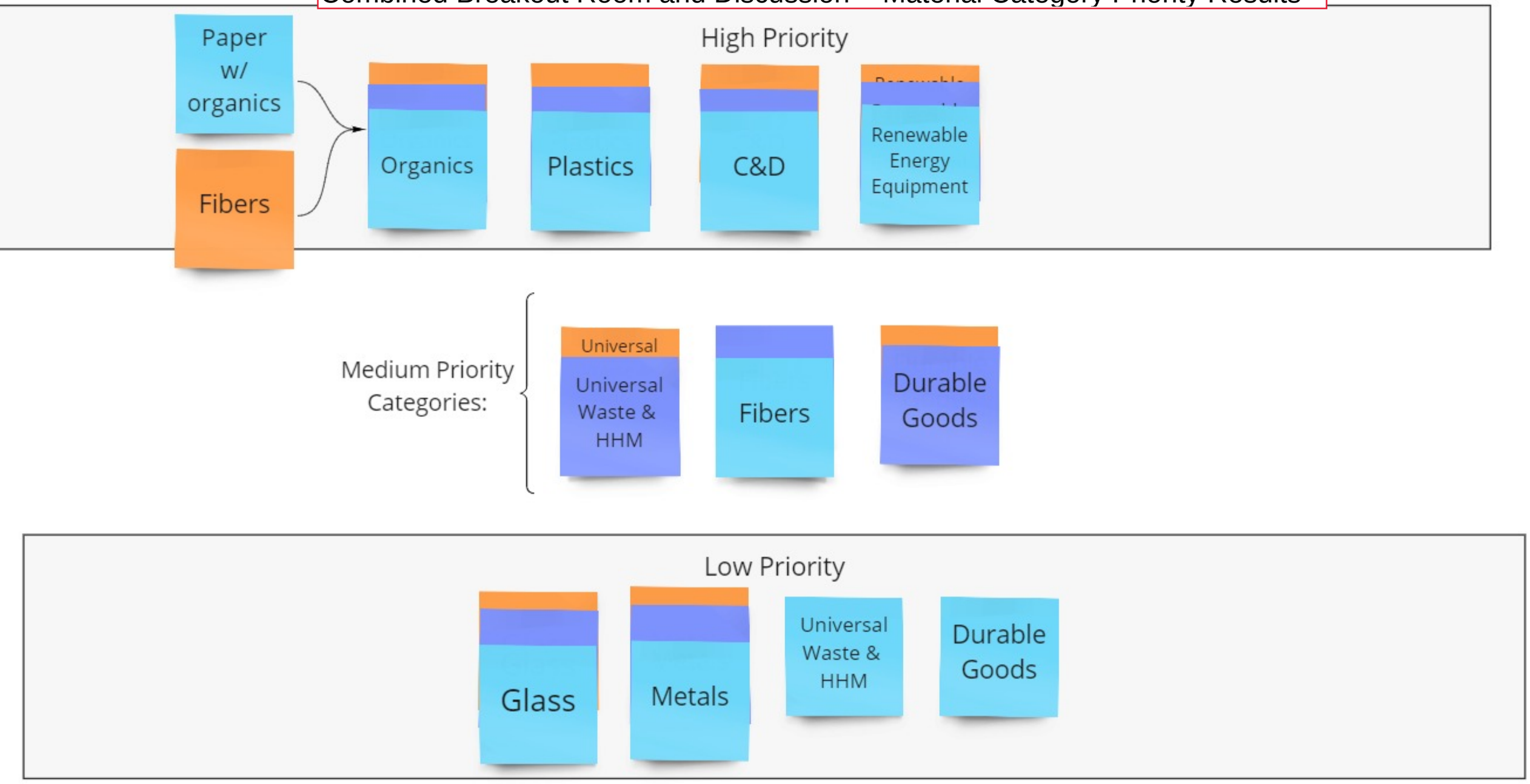
Breakout Room #3 - Material Category Priority Results

Category Criteria:

- Phase I Recommendation
- Environmental Benefits
- % of Disposed Waste Stream
- Feasibility for Implementation



Combined Breakout Room and Discussion - Material Category Priority Results

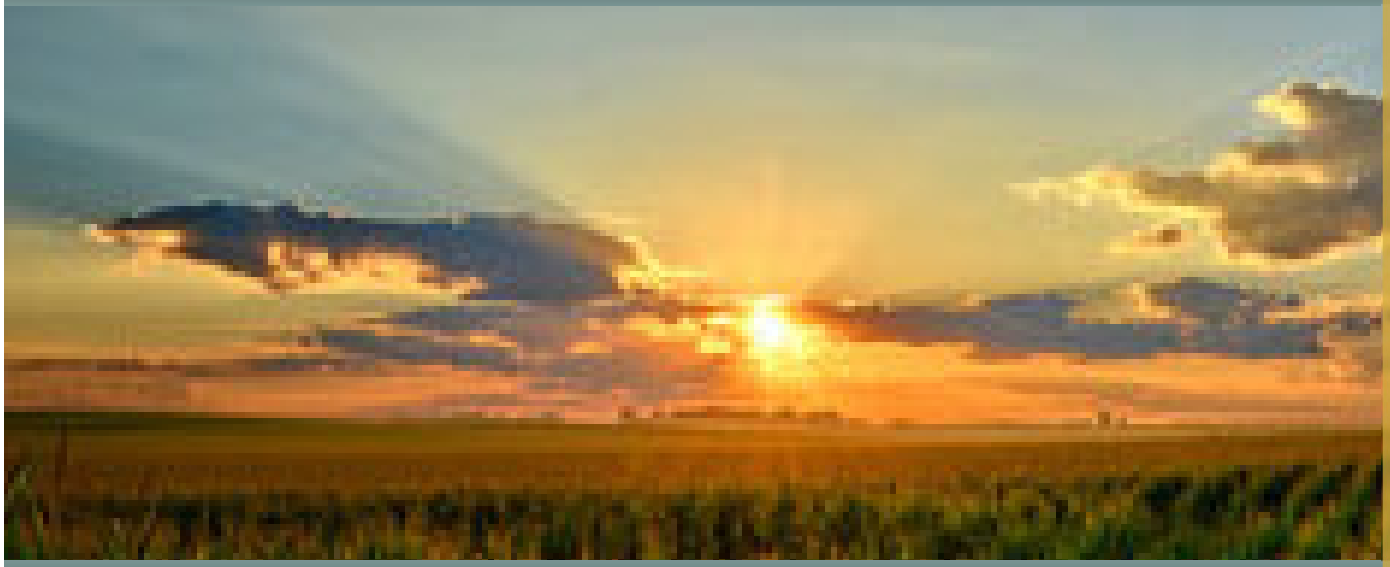


ATTACHMENT E

STAKEHOLDER MEETING #1 PRESENTATION SLIDES

IOWA DNR | PHASE II SMM VISION FOR IOWA

SCS ENGINEERS



Work Session #1
March 25, 2021

WELCOME!

Step 1 Please answer all 3 Zoom Questions

Step 2 Please rename your Zoom tile screen with your name and affiliation, such as company or organization. Right click on your video screen and select "rename"


WELCOME

Introductions

Introduction Survey Results

Expectations

- Ask a lot of questions
- Be open to new ideas and concepts
- Consider serving on a subcommittee
- Share information and solicit input from your co-workers, friends, and family
- Please keep participating

Agenda

I. Introductions

II. SMM Background

Break (5 Min)

III. Introduction to Phase II

Break (10 minutes)

IV. Materials Prioritization (break out groups)

Break (5 minutes)

V. Next Steps and Q&A

What is SMM?

"Sustainable materials management is an approach to using and reusing materials most productively throughout their entire life cycles"

It represents a change in how our society thinks about the use of natural resources and environmental protection

Source: USEPA

SMM Objectives

Use materials in the most productive way with an emphasis on using less

Reduce toxic chemicals and environmental impacts throughout the material life cycle

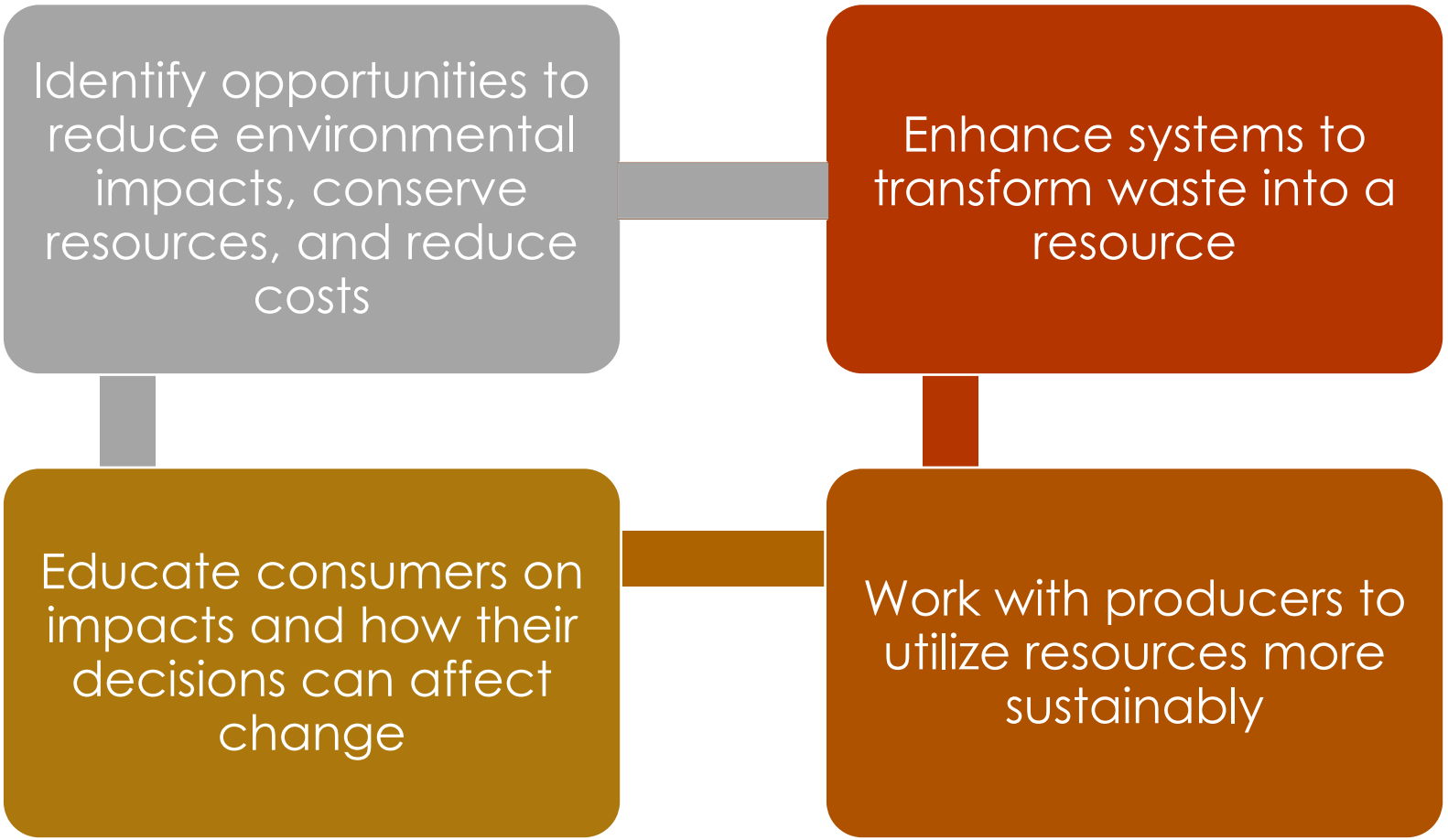
Assure we have sufficient resources to meet today's needs and those of the future

SMM Need

Global raw material use rose during the 20th century at about twice the rate of population growth

For every 1 percent increase in gross domestic product, raw material use has risen by 0.4 percent

SMM Value
Establishes a Framework to:



Phase I Review

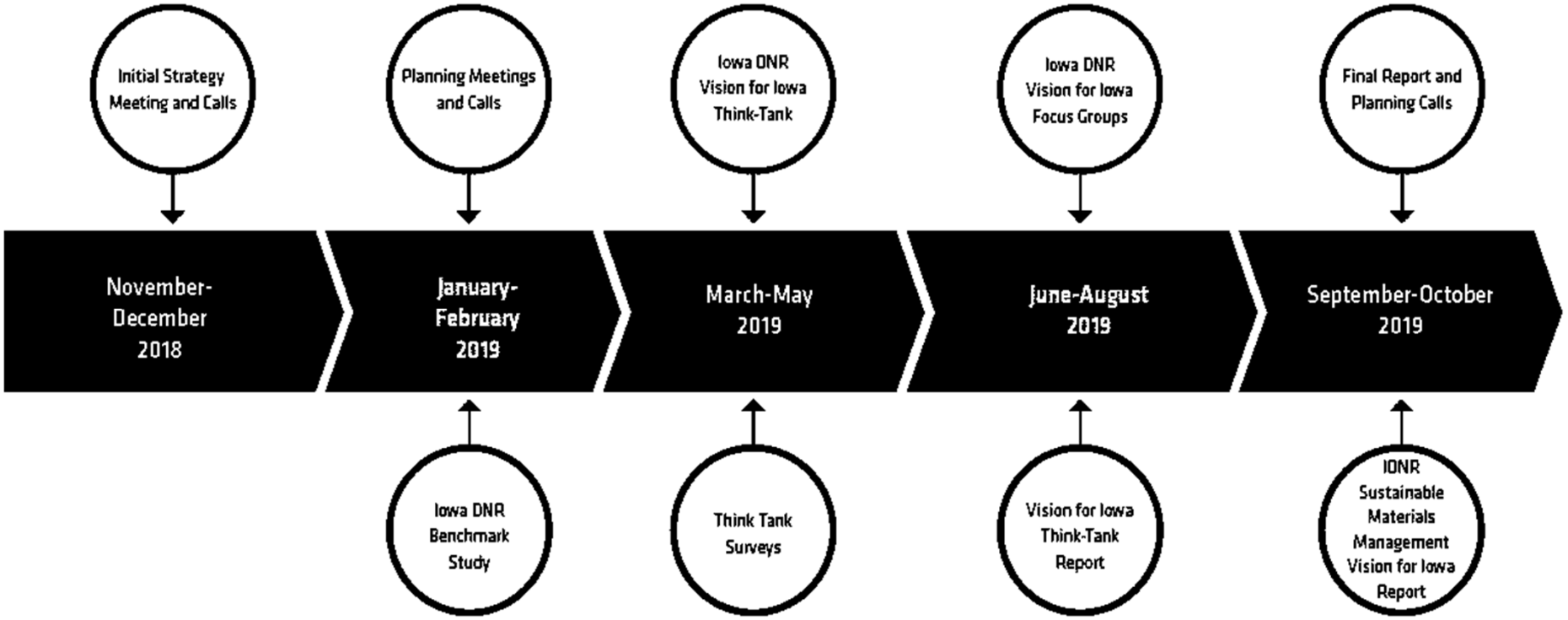
Visioning Process

Statewide planning process to create a vision to guide solid waste management using SMM as its foundation

Gathered input from a broad set of stakeholders through a dynamic planning process

Used a scenario planning methodology to explore future directions and implications

Visioning Process Timeline



Benchmarking

- Planning process used by respective states to transition to SMM
- Key SMM principles and objectives
- Statewide SMM policies and programs identified for implementation
- Program funding
- Other relevant details

Benchmarking

State	Sustainable Materials Planning Document	Material Life Cycle Analysis	Recycling Market Development	Food Waste Management	Sustainable Materials Stakeholder (SMM) Education	Container Deposit Laws	Materials Stewardship
Minnesota	√	√	√	√	√		√
Vermont	√	√	√	√	√	√	√
Maine	√	√		√	√	√	√
Oregon	√	√	√	√	√	√	√
Tennessee	√			√	√		

Minnesota

State led with County and stakeholder input

75% recycling goal and material capture rate goals

Product stewardship laws for carpet, mercury lamps, batteries, paint, and mattresses

Communities required to provide curbside recycling now required to offer curbside organics collection

Funded through Solid Waste Management Tax

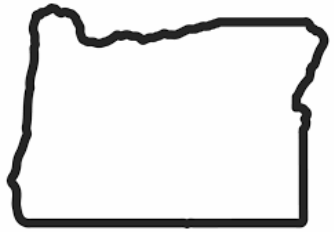
Vermont

- Driven by legislatively mandated goals
- Stakeholder participation in public comment period and working groups
- Food waste disposal ban
- Composting and anaerobic digestion facilities
- Online Universal Recycling Map and edible food recovery tools
- Product stewardship laws
- Grant programs
- Funded through landfill surcharge fee of $6.00/ton

Maine

- 50% diversion goal
- Edible food waste recovery and food rescue
- Product stewardship laws for e- waste, batteries, cell phones, light bulbs, and thermostats
- Focus on packaging
- Online tool kits (i.e. PAYT)
- Funded through: State Environmental Fees (tires, cars, batteries); licensing and annual reporting fees, and landfill surcharge fee of $2.00 per ton

Oregon



- Workgroup developed 2050 vision, framework, and action steps
- Used life cycle analysis to create goals and to measure outcomes
- Specific goals for stages of material life cycle
- Prioritized food reclamation
- Online resources to engage local leaders and citizens
- Product stewardship for carpet, paint, electronics, and packaging materials
- Grant awards
- Funded through landfill surcharges not to exceed $1.18/ton

Tennessee

- Conducted three stakeholder engagement sessions
- Identified needs and challenges to transition from ISWM to a SMM system
- Focused effort to encourage organics recycling
- Grants for organic collection, composting, and anaerobic digestion; rural recycling
- Whole tires and used oil disposal ban
- Funded through landfill and product surcharges

Benchmarking Conclusions

Many statewide SMM programs linked to waste reduction and diversion goals

State funding mechanisms not likely sustainable in the long-term

States transitioning to SMM system prioritize increased organics diversion and fostering materials stewardship

Iowa Groundwater Protection Act

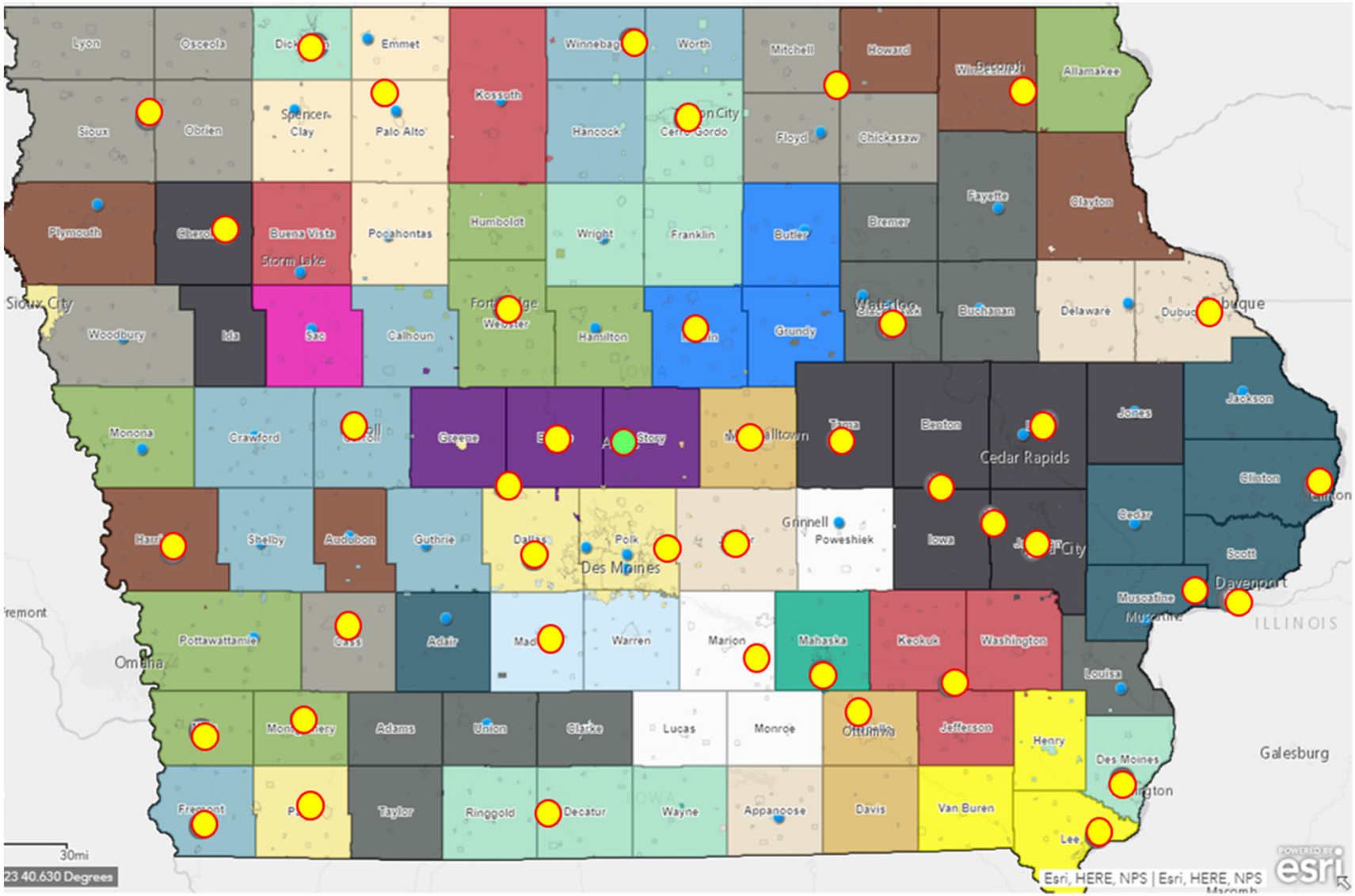
1987 groundbreaking legislation

Goal: Prevent contamination of groundwater from point and non-point sources

Authorized DNR to adopt groundwater rules, establish monitoring network, and education

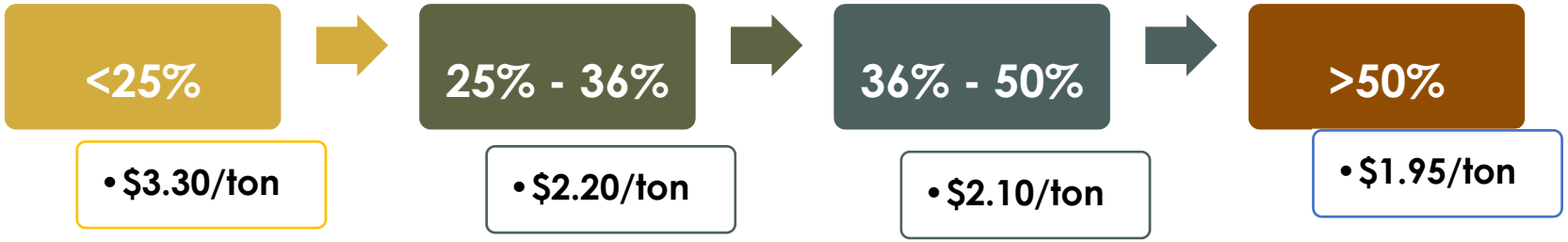
Established funds with specific use goals:

- Solid Waste Account
- Agriculture Management Account
- Household Hazardous Waste Account
- Storage Tank Management Account


Lyon
Osceola
Dickinson
Emmet
Kossuth
Winnebago
Worth
Mitchell
Howard
Winneshiek
Allamakee
Sioux
O'Brien
Clay
Palo Alto
Hancock
Cerro Gordo
Floyd
Chickasaw
Fayette
Clayton
Plymouth
Cherokee
Buena Vista
Storm Lake
Pocahontas
Humboldt
Wright
Franklin
Butler
Bremer
Buchanan
Delaware
Dubuque
Woodbury
Ida
Sac
Calhoun
Webster
Hamilton
Hardin
Grundy
Monona
Crawford
Greene
Story
Tama
Benton
Linn
Jones
Jackson
Cedar Rapids
Clinton
Harrison
Shelby
Audubon
Guthrie
Dallas
Polk
Des Moines
Jasper
Poweshiek
Grinnell
Iowa
Johnson
Cedar
Scott
Davenport
Muscatine
Pottawattamie
Cass
Adair
Madison
Warren
Marion
Mahaska
Keokuk
Washington
Louisa
Omaha
Montgomery
Adams
Union
Clarke
Lucas
Monroe
Ottumwa
Jefferson
Henry
Des Moines
Galesburg
Fremont
Taylor
Ringgold
Decatur
Wayne
Appanoose
Davis
Van Buren
Lee
ILLINOIS
30mi
Esri, HERE, NPS | Esri, HERE, NPS

Waste Disposal Diversion Goals & Incentives

Progress has been measured and valued using disposed tonnages since establishment of the Iowa Groundwater Protection Act.



State Tonnage Fees Support

Solid Waste Alternatives Program (SWAP) – Grants and loans to support waste diversion efforts

Derelict Buildings Program – Grants to address derelict buildings and divert materials from disposal

Iowa Waste Reduction Center (IWRC) – Environmental consulting, assistance, training, and education services

Iowa Waste Exchange (IWE) – Assist waste generators to divert materials from disposal for reuse

State Tonnage Fees Support

Regional Collection Centers (RCC) – Grants to establish RCCs, support/expand services, and provide reimbursement support for disposal costs

Environmental Management System (EMS) – Supports Solid Waste Agencies to identify and reduce environmental risks

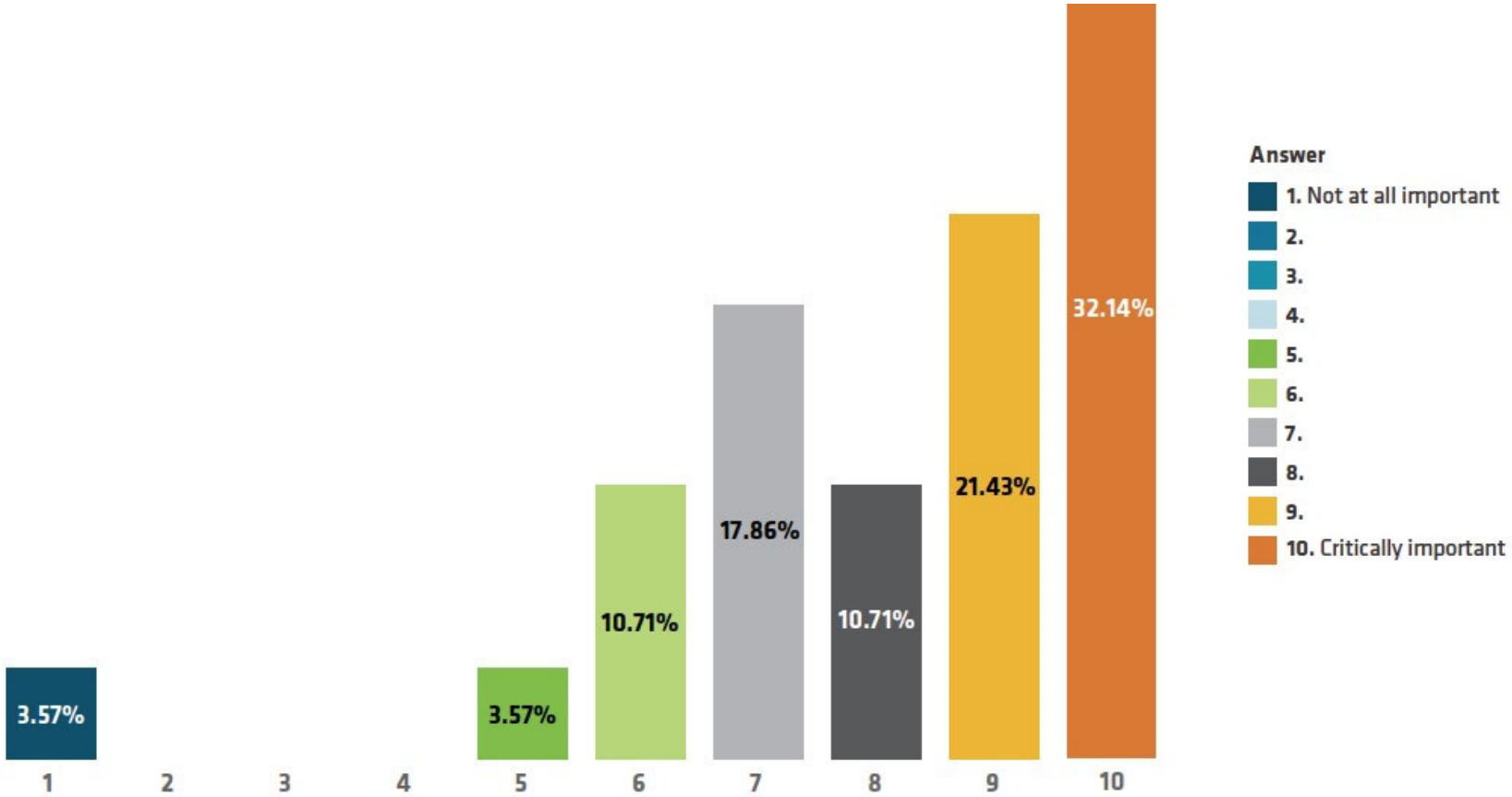
Pollution Prevention (P2) Services – Assess operations for efficiencies, pollution prevention, & waste reduction for Iowa businesses, industry, institutions, or government agencies

DNR Solid Waste Operations

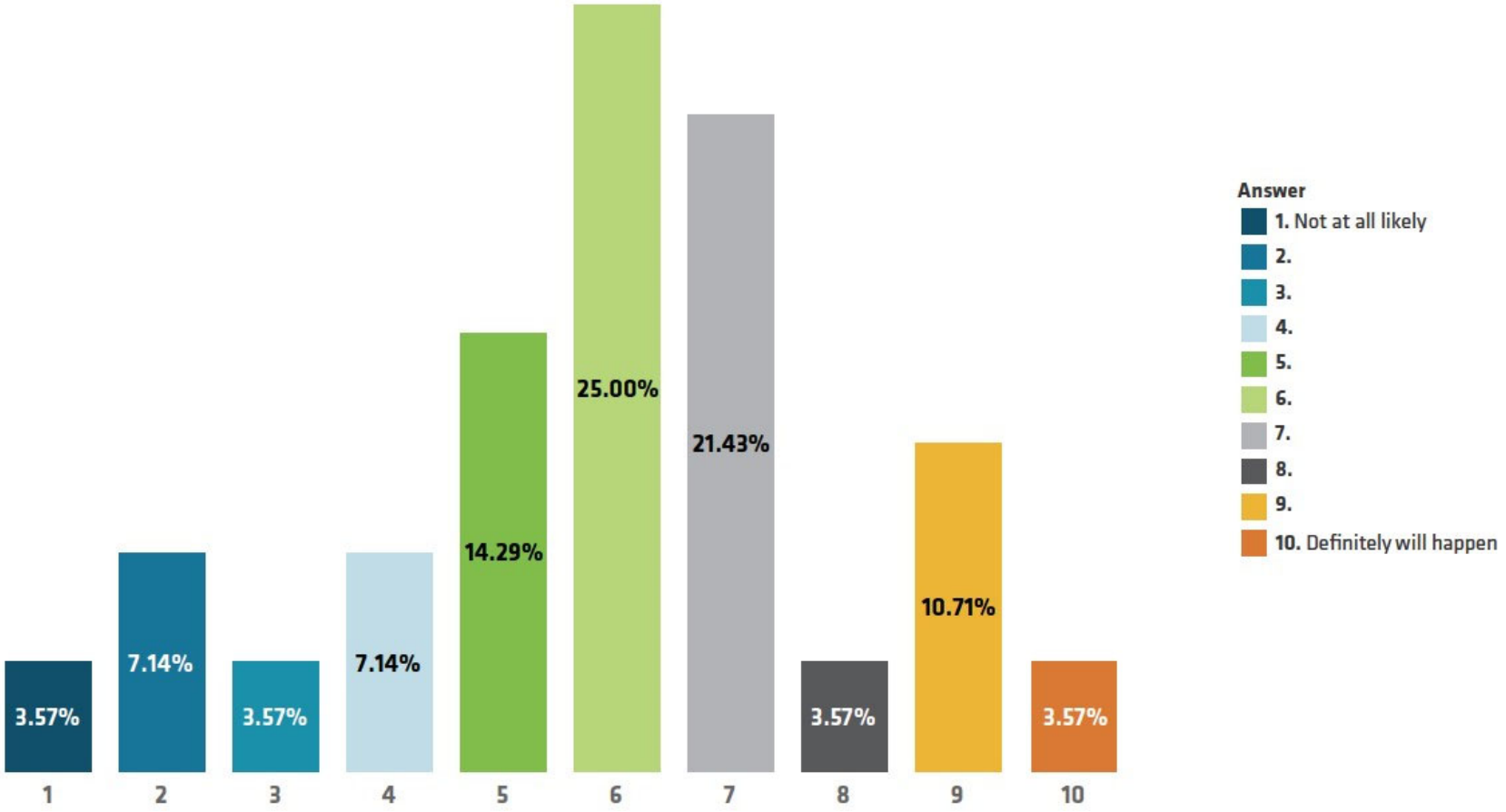
Additional Programs

- Iowa Bottle Bill
- Mercury thermostats and vehicle switches program
- Rechargeable batteries program
- Waste Flow Control
- Collaborations with cities, institutions, and commercial industries
- Community Climate Action Plans
- Public/Private Sustainability Goals

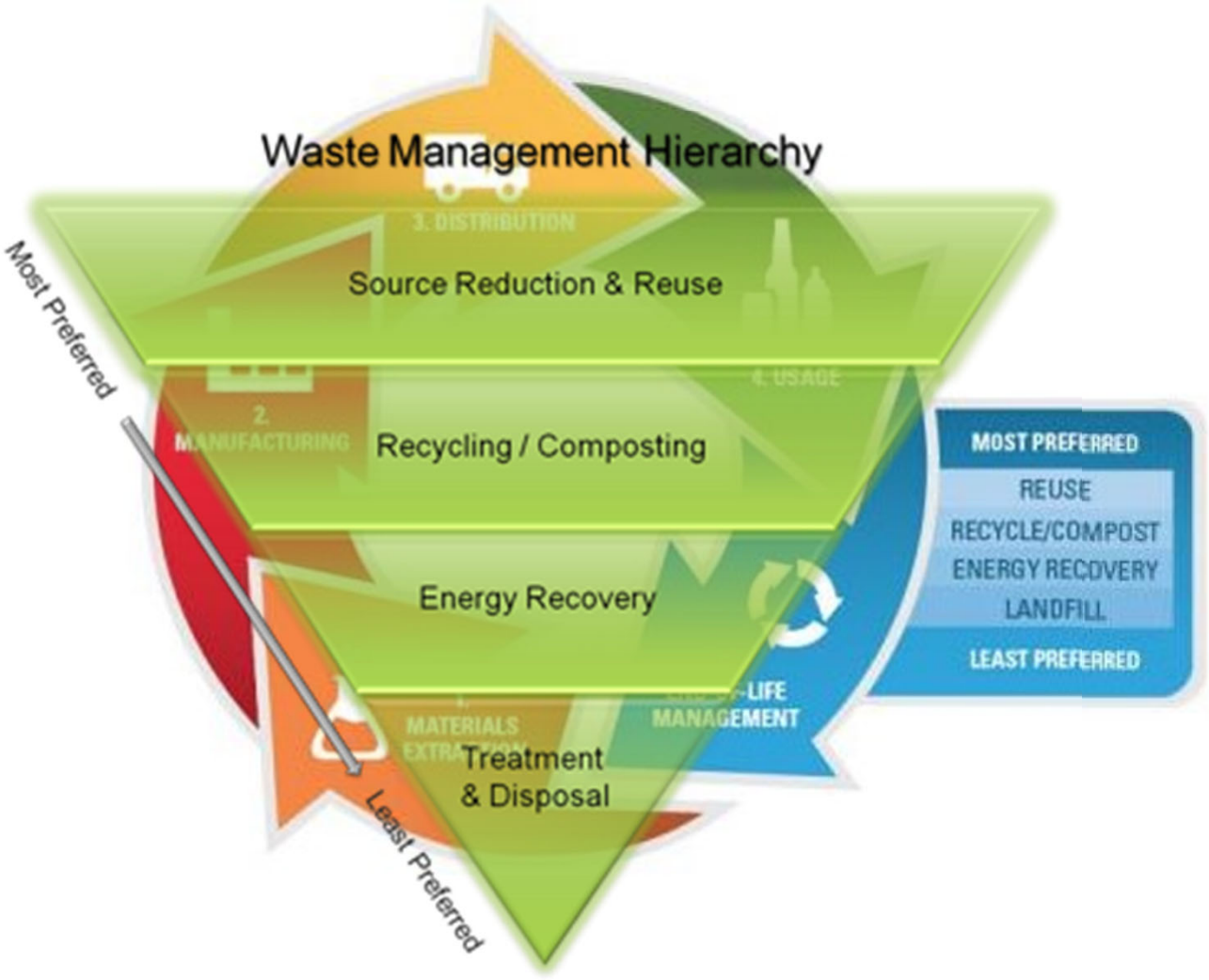
Visioning Results- SMM Importance



Visioning Results- Feasibility



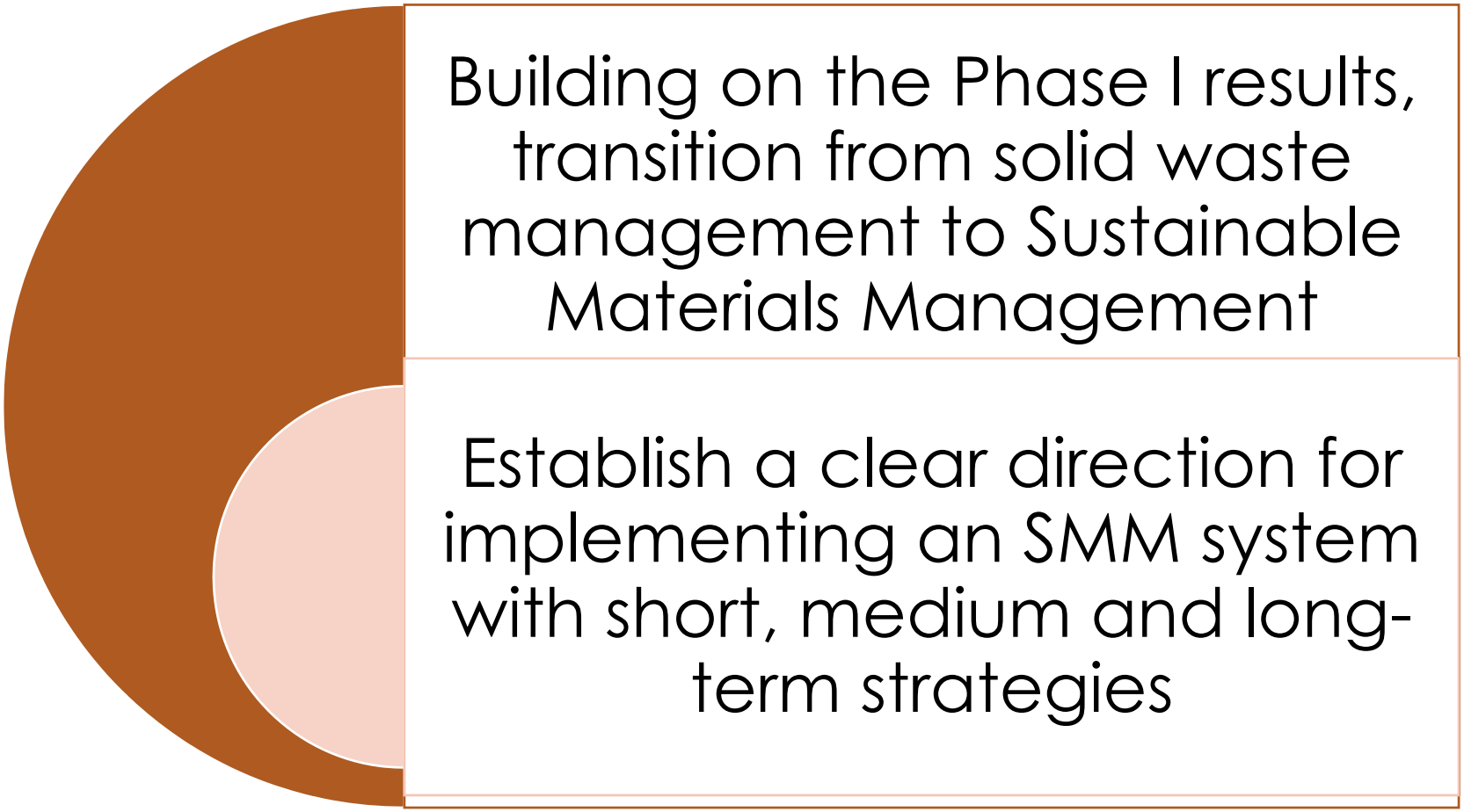
Iowa Transitioning from ISWM to SMM



BREAK (5 Minutes)

Phase II

Purpose and Goal



Process

Prioritize material categories

Select specific material types within each category

Apply LCA to material types

Define and recommend specific strategies

- Policies
- Programs
- Infrastructure
- Funding mechanisms

Establish implementation timeline, responsible parties, and performance metrics

Stakeholder Group Role

Obtain perspectives on SMM adoption and implementation

Consult and advise DNR on establishing SMM

Provide guidance to subcommittees

No formal voting; may be polling and/or surveying

Subcommittees Role

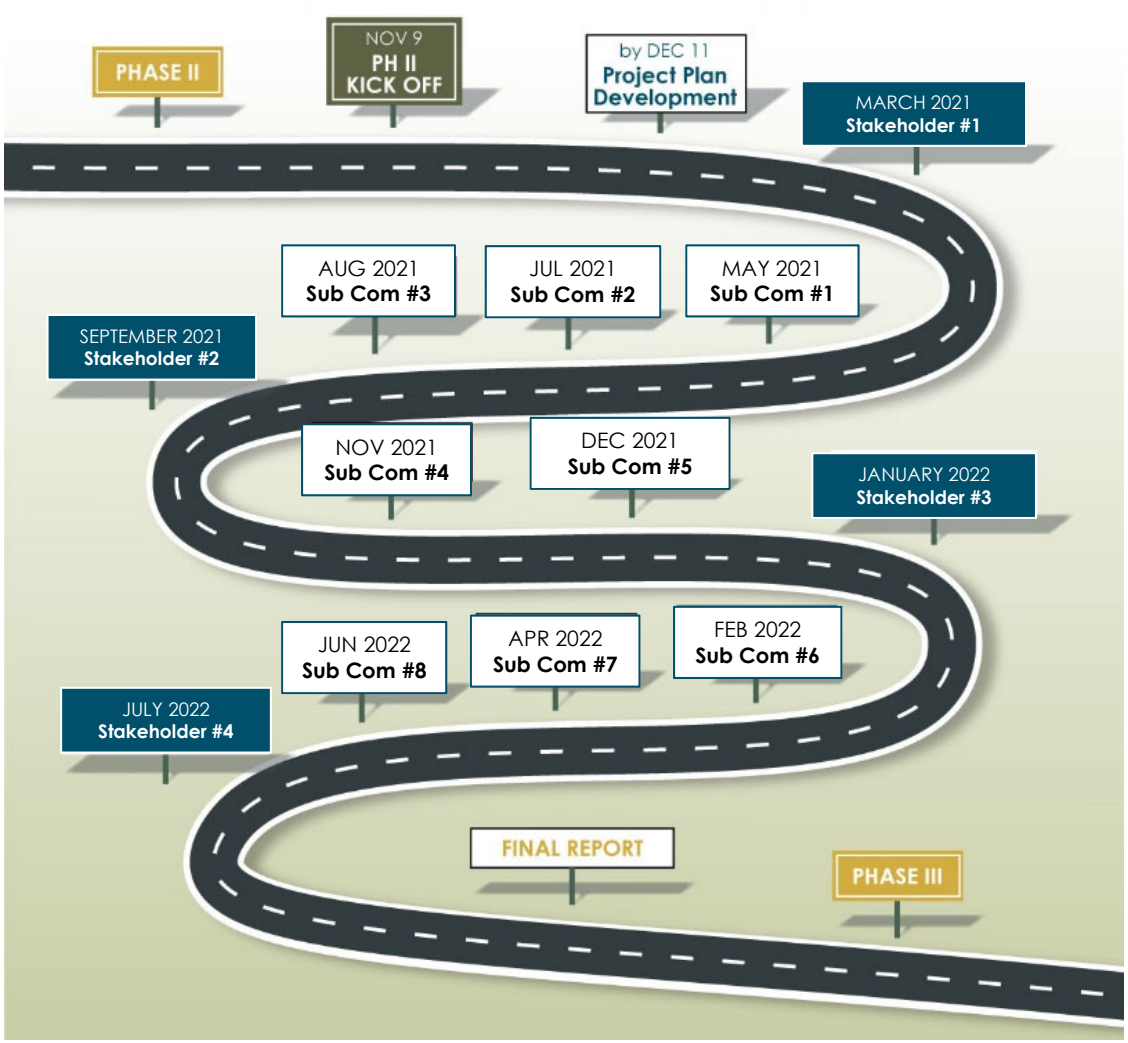
- Will finalize material types, evaluate LCA's, identify strategies
- Will consist of nine to 12 individuals
  - Combination of invitation and application
- Will elect a representative for their group
- Will make decisions using modified consensus

Research

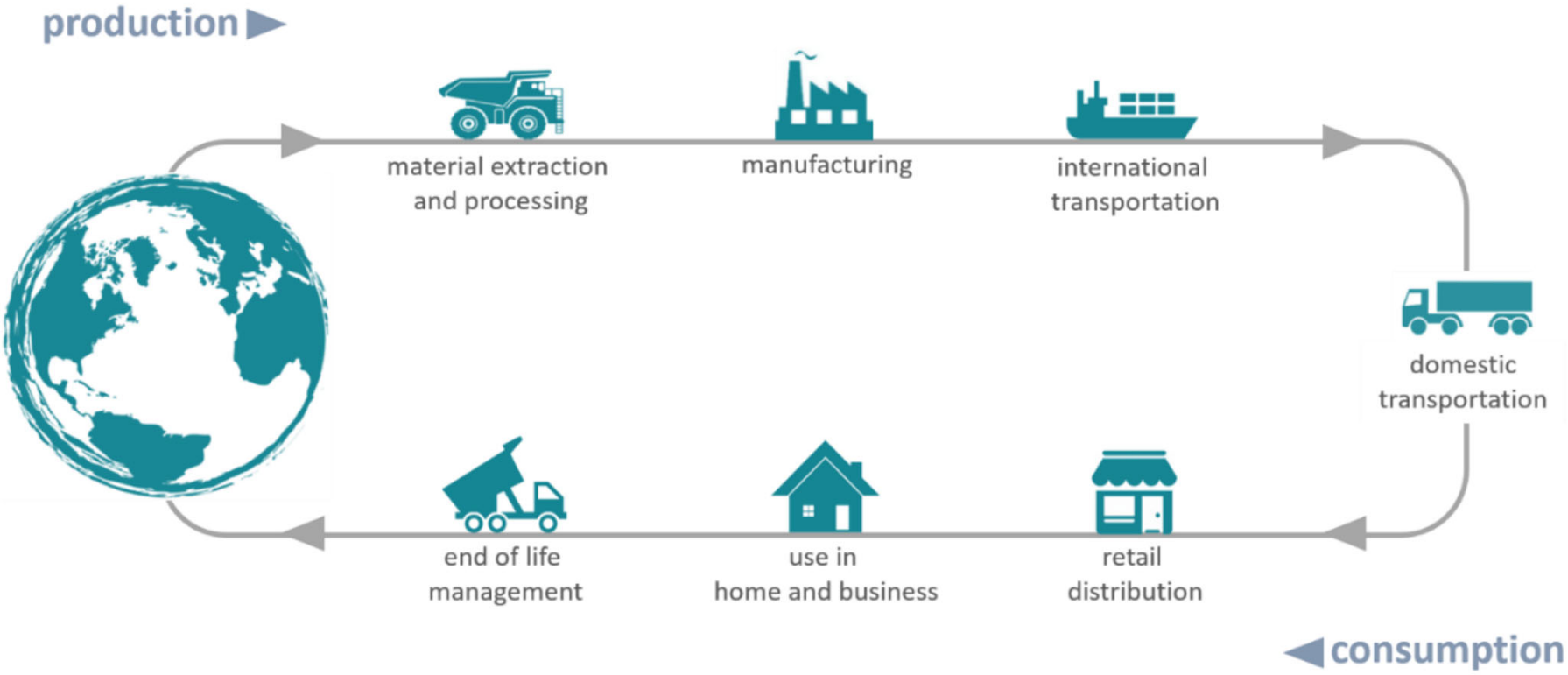
- Iowa products and producers
- Existing LCA's
- Strategies, metrics, reporting

Iowa Waste Reduction Center
IWRC
University of Northern Iowa

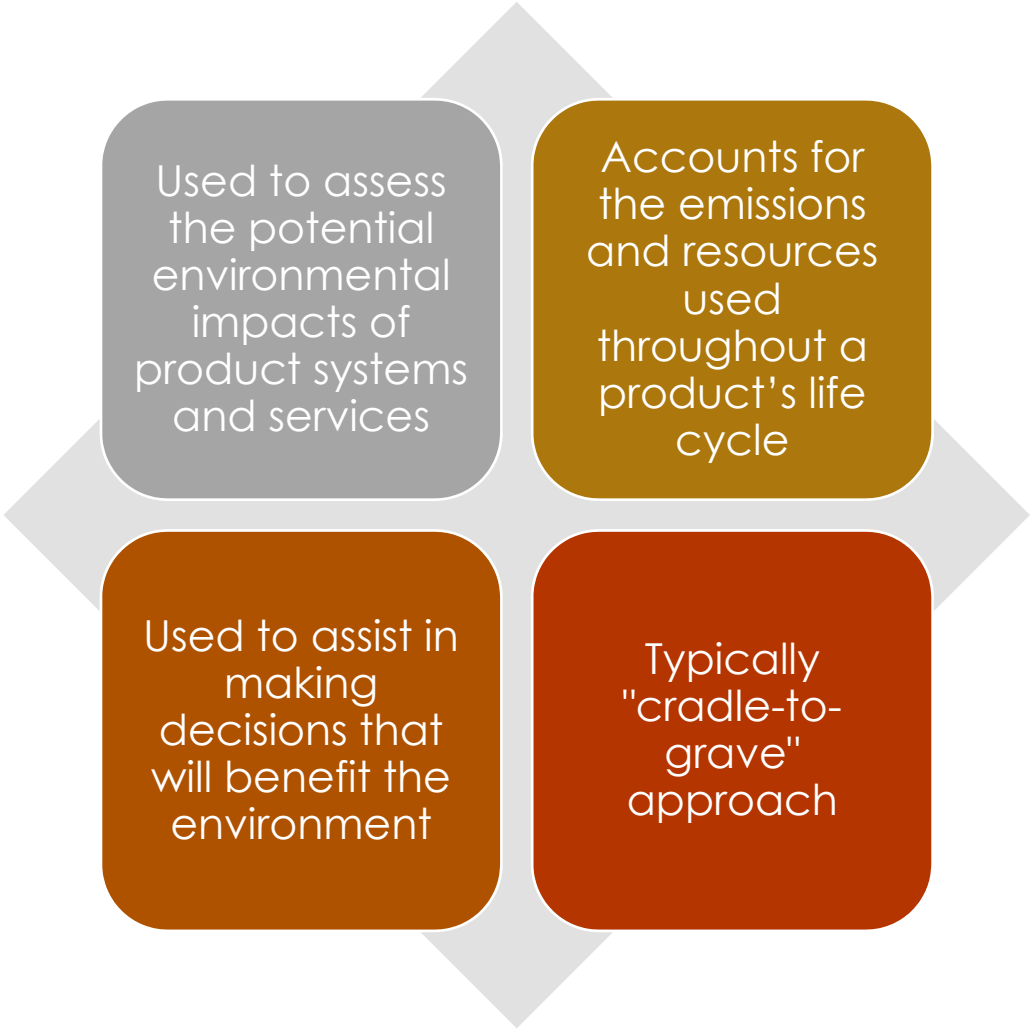
Schedule


PHASE II
NOV 9
PH II
KICK OFF
by DEC 11
Project Plan
Development
MARCH 2021
Stakeholder #1
AUG 2021
Sub Com #3
JUL 2021
Sub Com #2
MAY 2021
Sub Com #1
SEPTEMBER 2021
Stakeholder #2
NOV 2021
Sub Com #4
DEC 2021
Sub Com #5
JANUARY 2022
Stakeholder #3
JUN 2022
Sub Com #8
APR 2022
Sub Com #7
FEB 2022
Sub Com #6
JULY 2022
Stakeholder #4
FINAL REPORT
PHASE III

Life Cycle Assessment



What is Life Cycle Analysis?



LCA Framework

- Definition of study goal and scope study
- Life cycle inventory analysis
- Life cycle impact assessment
- Interpretation of outcomes
- Improvements/alternatives

LCA Example

Glass Bottles

Aluminum Cans

Plastic Bottles

Potential Priority Material Categories


Plastics


Metals


Fibers


Organics


Glass


Construction and Demolition Debris


Household Hazardous Materials/Universal Wastes


Durable Goods


Renewable Energy Equipment

Category/Material Types

Plastics

- Rigid containers
- Rigid bottles
- Straws
- Bags
- Packaging
- Film
- Styrofoam
- Vinyl

Organics

- Yard trimmings
- Agricultural waste
- Pre-consumer food scraps
- Edible food
- Post-consumer food scraps
- Biosolids
- Manure
- Textiles

Category/Material Types

Durable Goods

- Appliances
- Carpet
- Mattresses
- Tires
- Vehicles
- Tools
- Luggage
- Lawn/Gardening Equipment

HHM/Universal Waste

- Paint
- Solvents
- Cleaning Supplies
- Lawn/Garden Supplies
- Electronics
- Light Bulbs
- Motor Oil/Filters
- Medicine
- Batteries

Category/Material Types

Fibers

- Office Paper
- Newspaper
- Magazines
- Corrugated Cardboard
- Packaging
- Fiberboard
- Junk mail

Metals

- Aluminum beverage containers
- Other aluminums (i.e. foil)
- Tin cans
- Ferrous metal
- Other metals

Category/Material Types

Glass

- Bottles
- Ceramics
- Windows
- Porcelain
- Mixed Cullet
- Pyrex

C&D

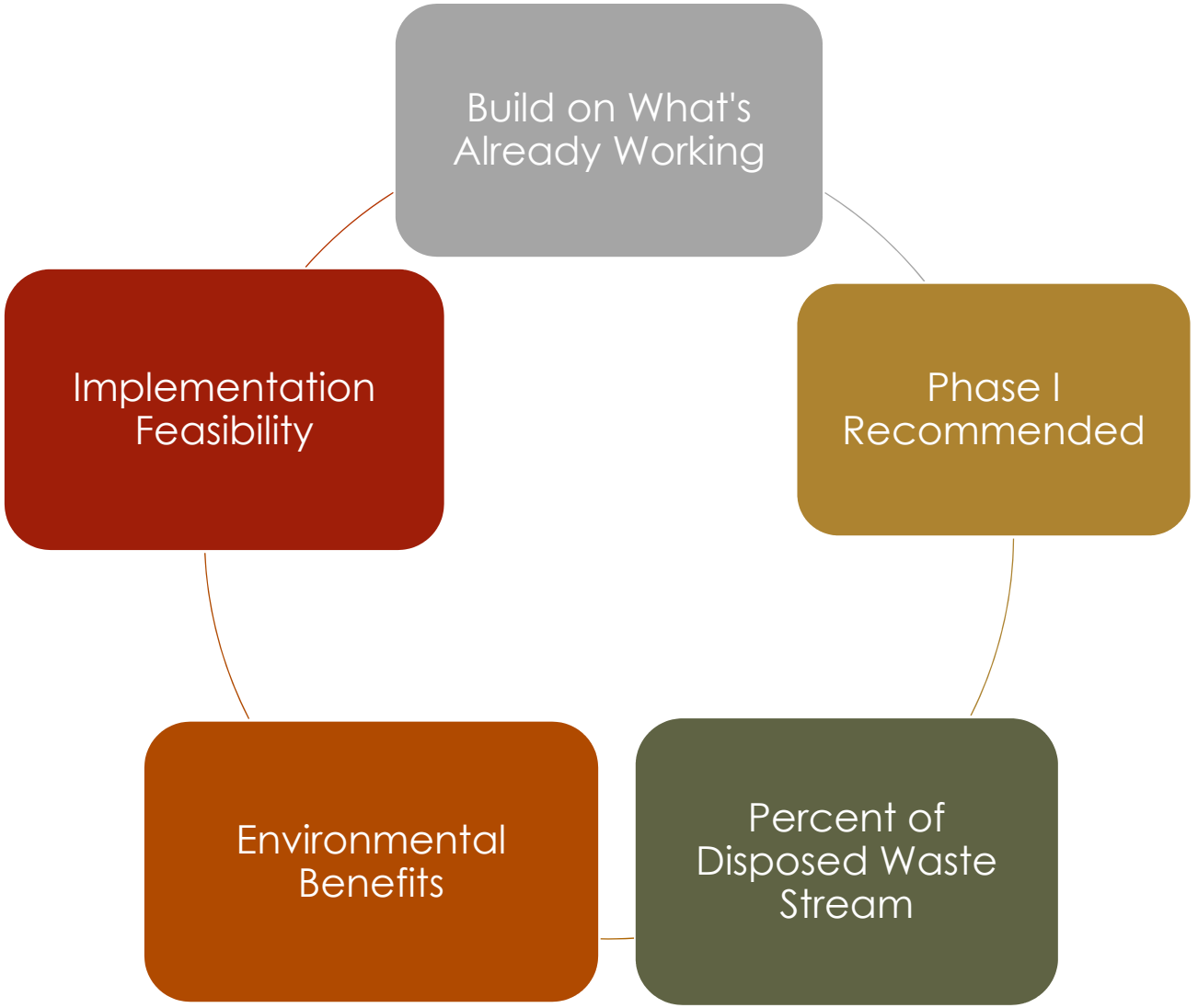
- Treated Wood
- Untreated Wood
- Roof Shingles
- Asphalt Paving
- Bricks, Rocks, Concrete
- Drywall, Plaster, Gypsum Board

Category/Material Types

Renewable Energy Equipment/Waste

- Windmill Blades
- Solar Panels
- Wire
- Batteries
- Ash

Criteria for Category Selection



Phase I Recommended

Single-Use Plastics

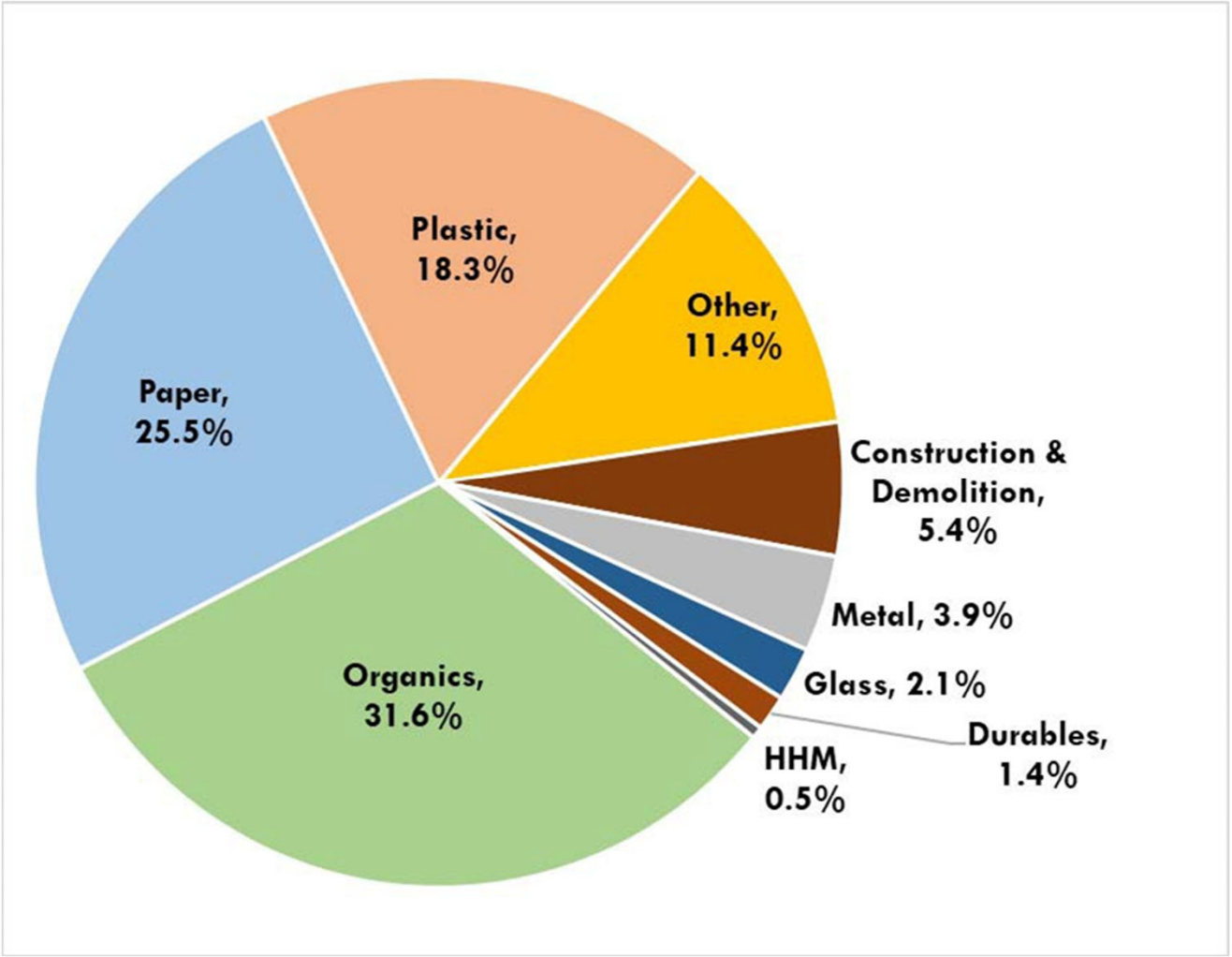
Organics

Paper and Plastic Packaging

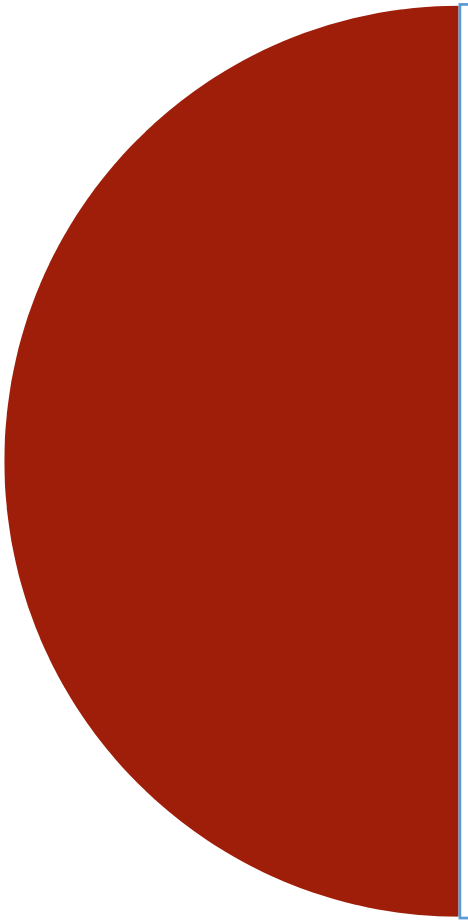
Build on What's Already Working

- Bottle Redemption Program (Certain Plastics, Metals and Glass)
- HHM Collection Sites
- Yard Waste Ban
- SWAP
- Iowa Waste Exchange (IWE)

Percent of Disposed Waste Stream



Environmental Benefits



Potential To:

- Reduce Greenhouse Gas Emissions
- Prevent Littering/Open Dumping
- Decrease Energy and Water Use
- Create Renewable Energy

BREAK (10 Minutes)

Break-Out Groups

Prioritization Mapping

SHORT BREAK

BREAKOUT GROUPS RESULTS


GOALS
What's Next?

Subcommittee/Stakeholder Meetings

Subcommittee Meeting #1

Evaluate category, narrow to material types

Subcommittee Meeting #2

Review LCA results

Subcommittee Meeting #3

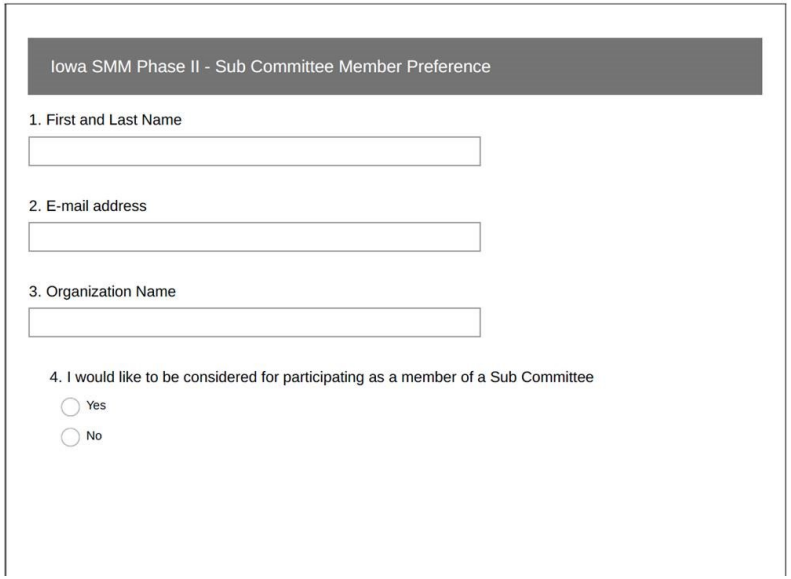
Materials through SMM hierarchy – what can Iowa do?

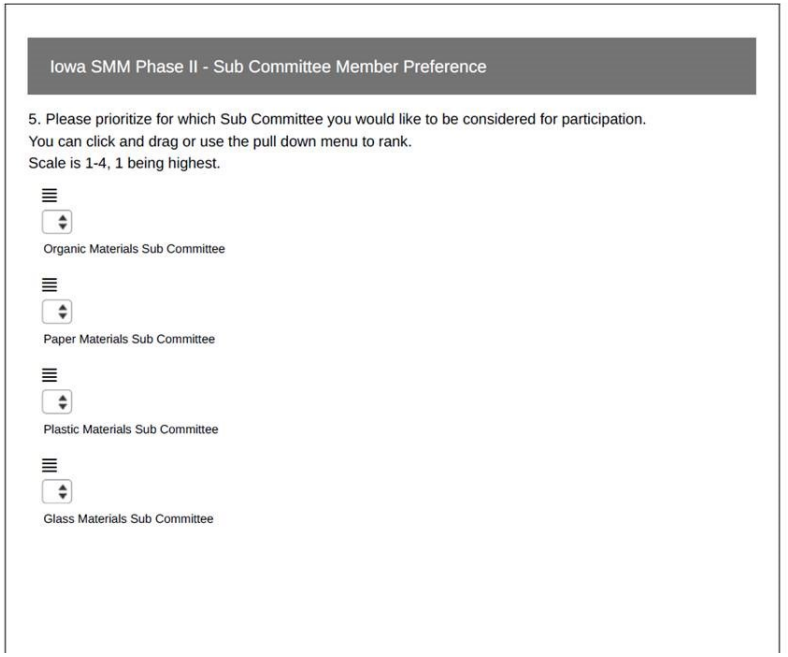
Metrics for success

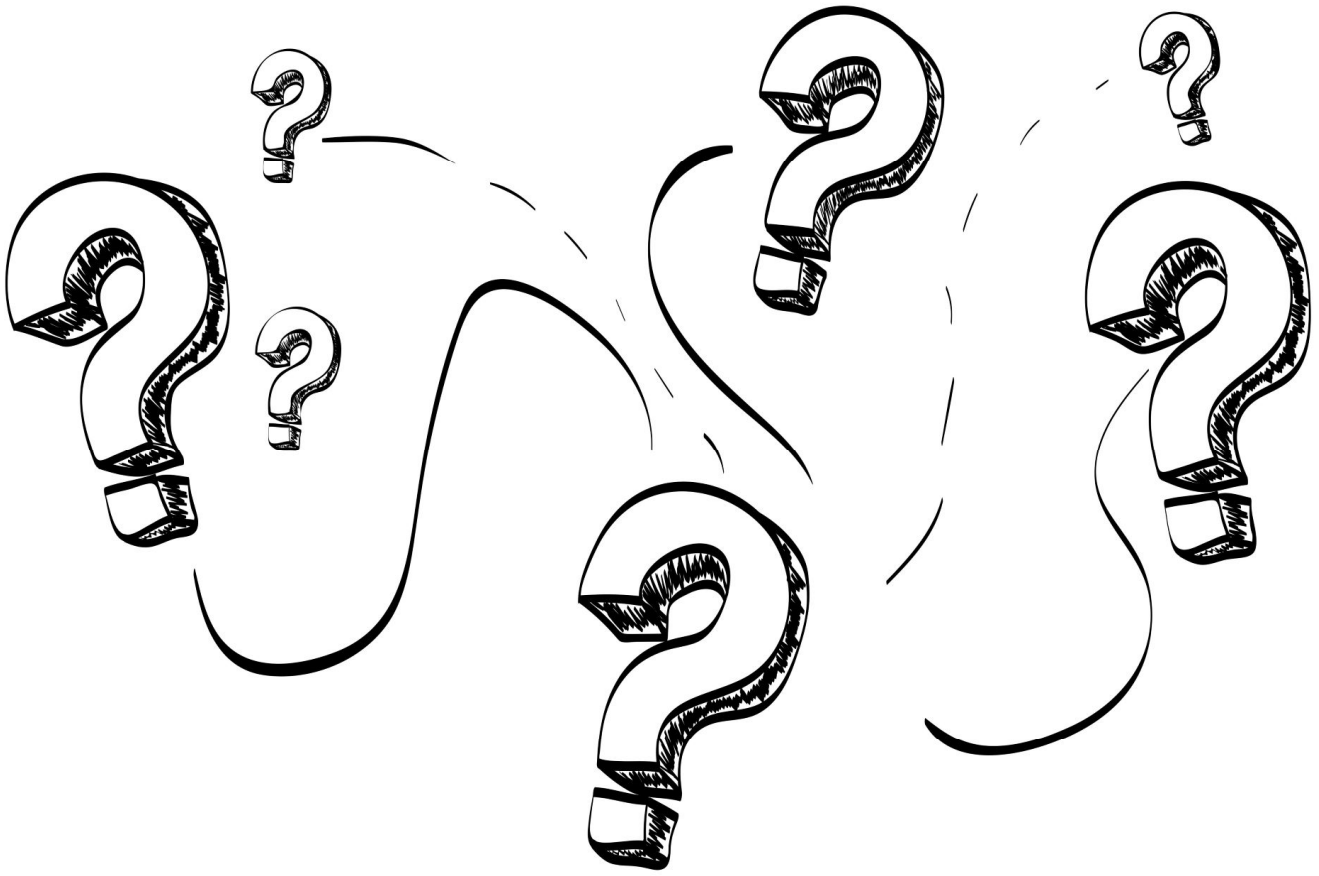
Stakeholder Meeting #2

Present results of Subcommittee meetings 1-3

Subcommittees







ATTACHMENT F

RECODED FILES OF MEETING AND BREAKOUT ROOMS