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

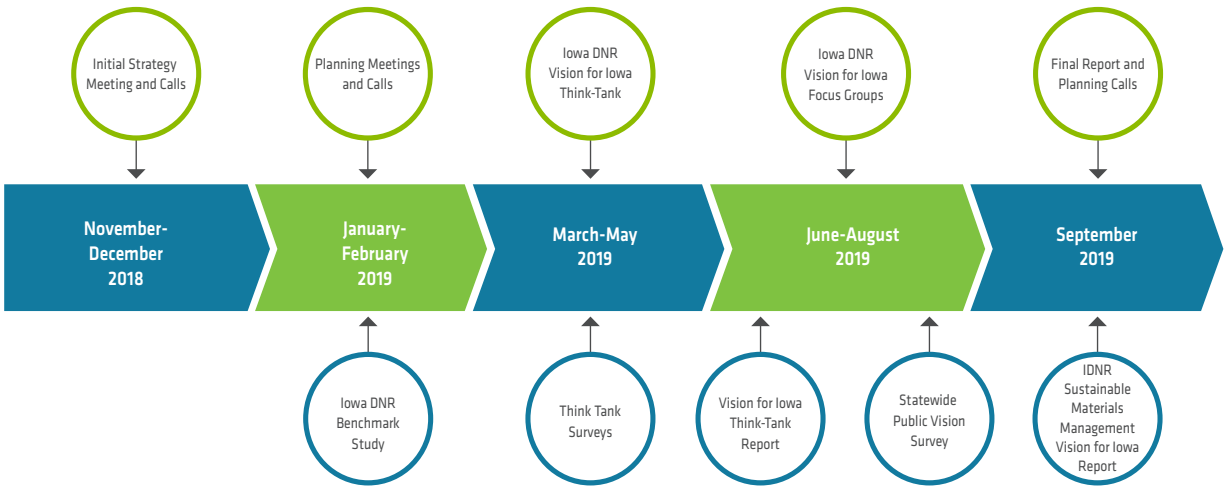
1.0 EXECUTIVE SUMMARY

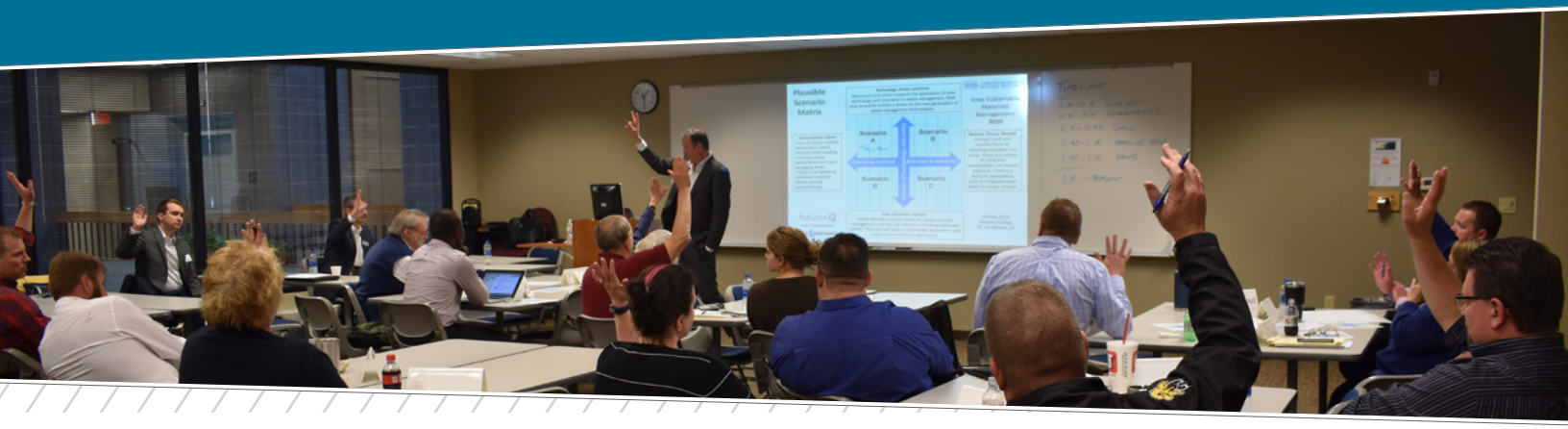
In late 2018, the Iowa DNR embarked on a comprehensive Visioning Project for the future of sustainable materials management in the State of Iowa. The firms of Burns and McDonnell and Future iQ were contracted to facilitate a series of DNR and stakeholder meetings, research and outreach that will ultimately 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

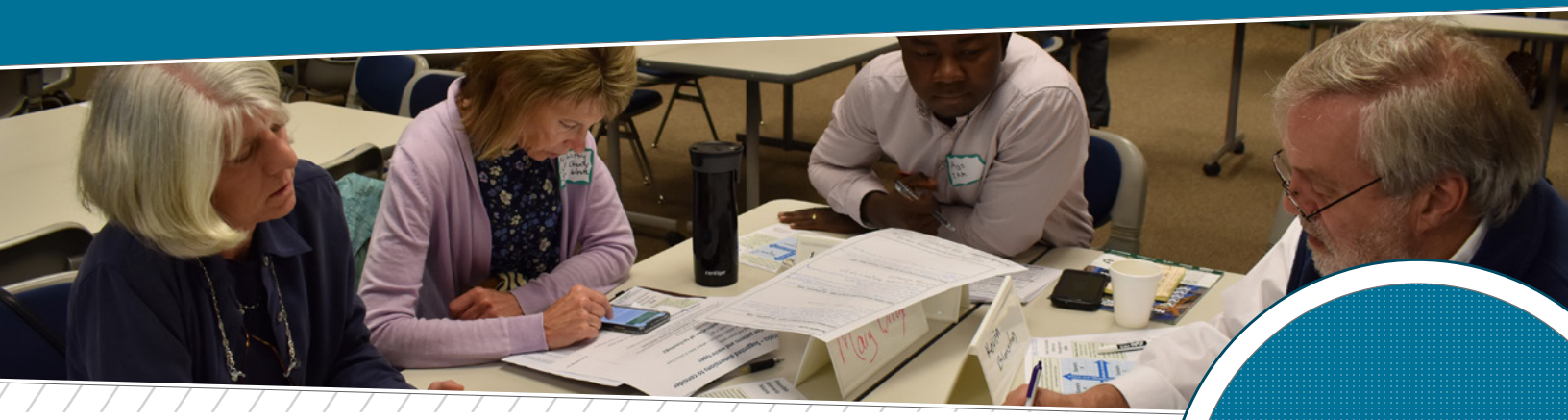
Of particular relevance to the discussion on trends is the speed and scale of change occurring. Newly developed innovations are being implemented globally and locally at all scales, thereby changing the face of industries and society in a rapid and profound way. Manufacturing is at the forefront of this 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.

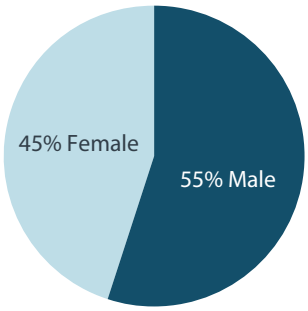
4.0 SURVEY RESULTS – KEY STAKEHOLDER INPUT

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.

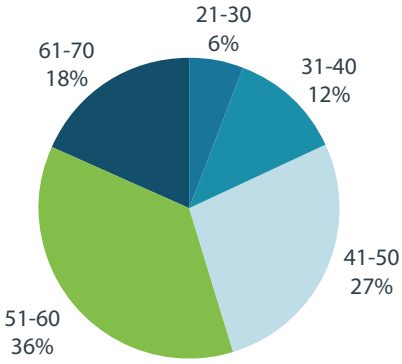
4.1 PROFILE INFORMATION

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.

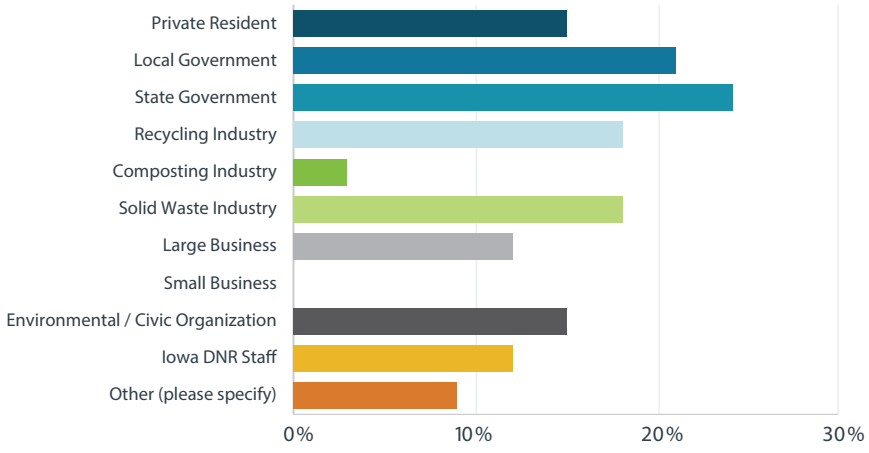
Please provide your gender



What is your age?



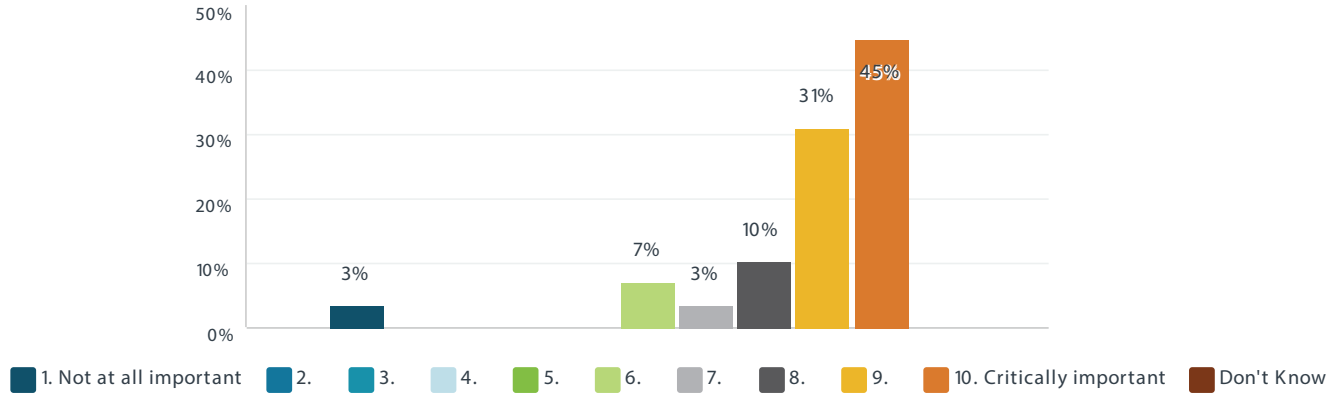
What is your organizational affiliation?



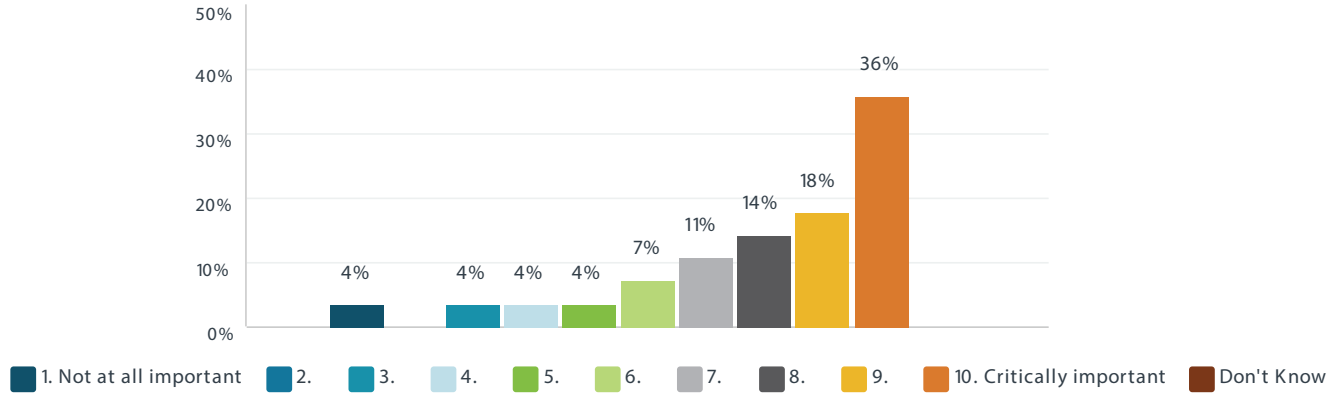
4.2 IMPORTANCE OF A SHARED VISION

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.

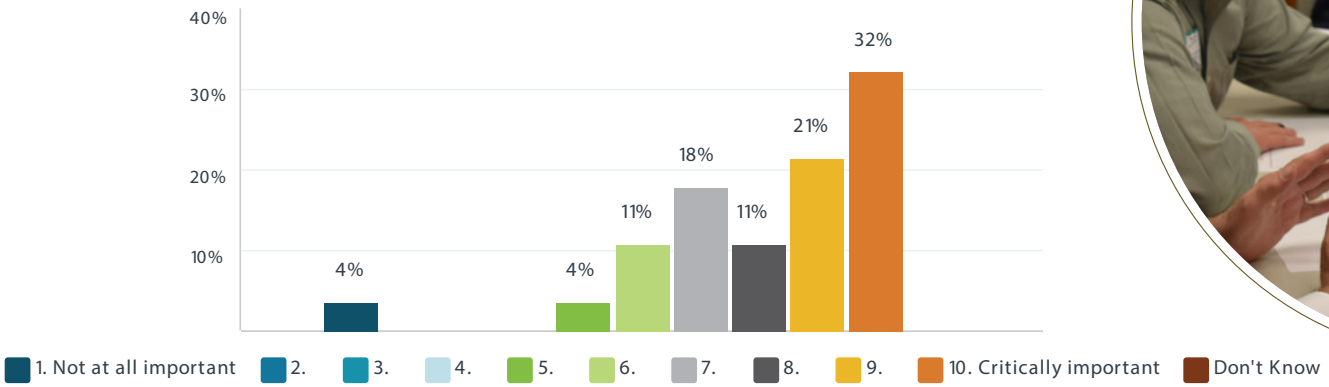
4.3 TRANSITIONING TO A SUSTAINABLE MATERIALS MANAGEMENT POLICY APPROACH

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:

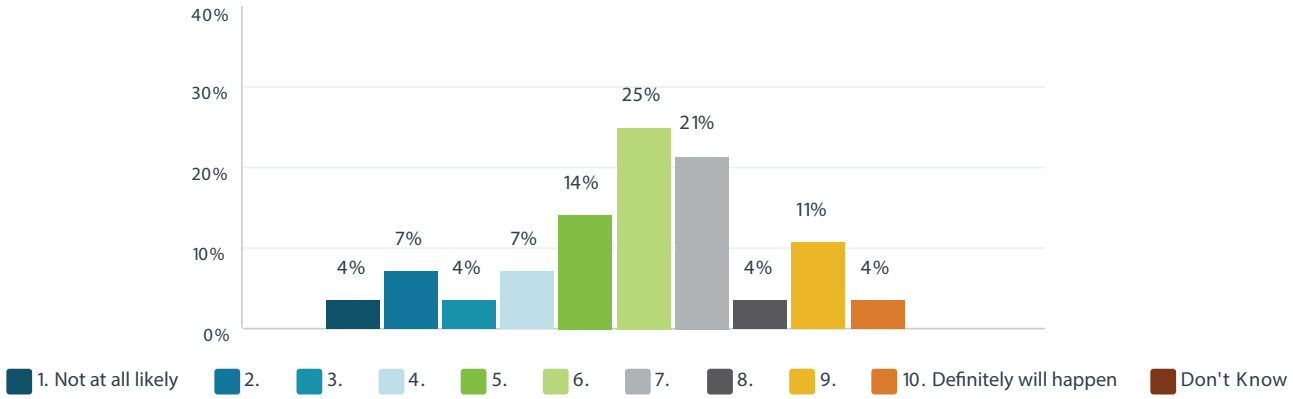
- Consistent advocacy for policy change at the legislative level will be necessary to move from integrated solid waste management to materials management in the State of Iowa.
- The key to the transition from integrated solid waste management to materials management will be the long-term sustainability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

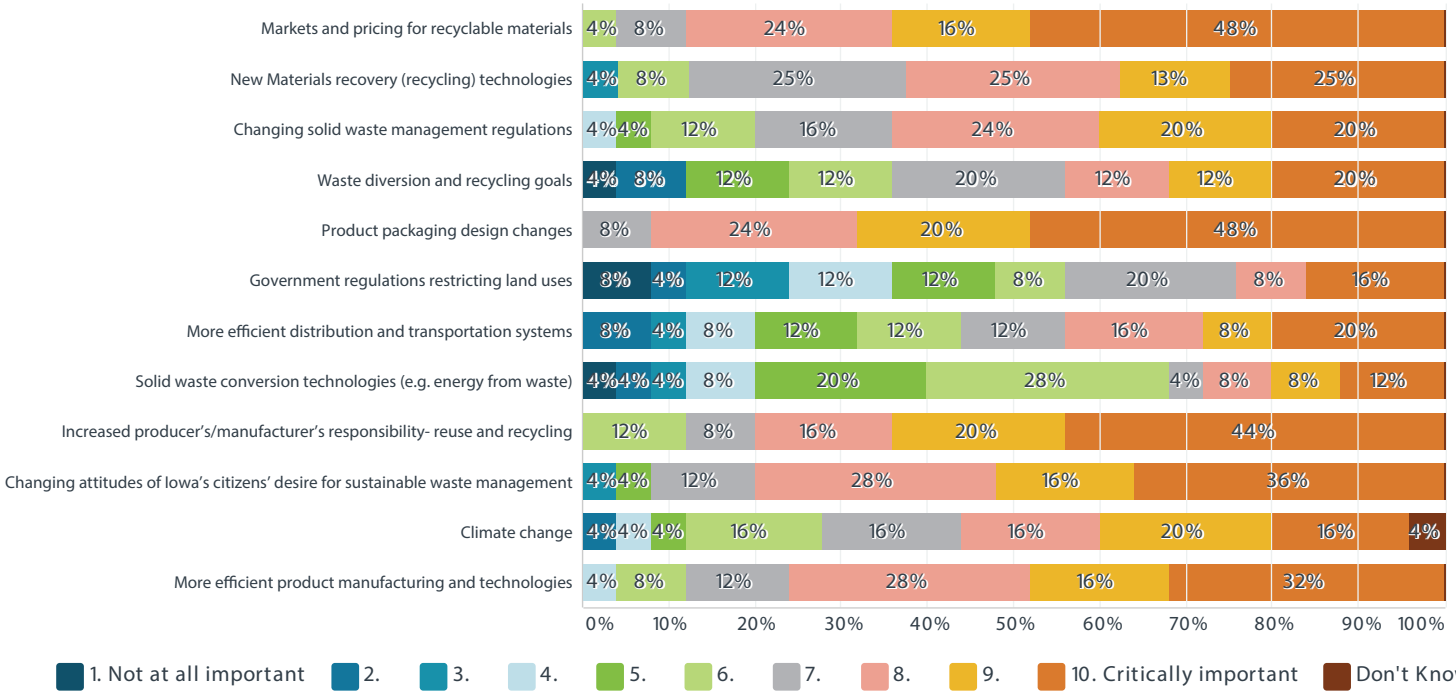
4.4 DRIVERS OF CHANGE ANALYSIS

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:

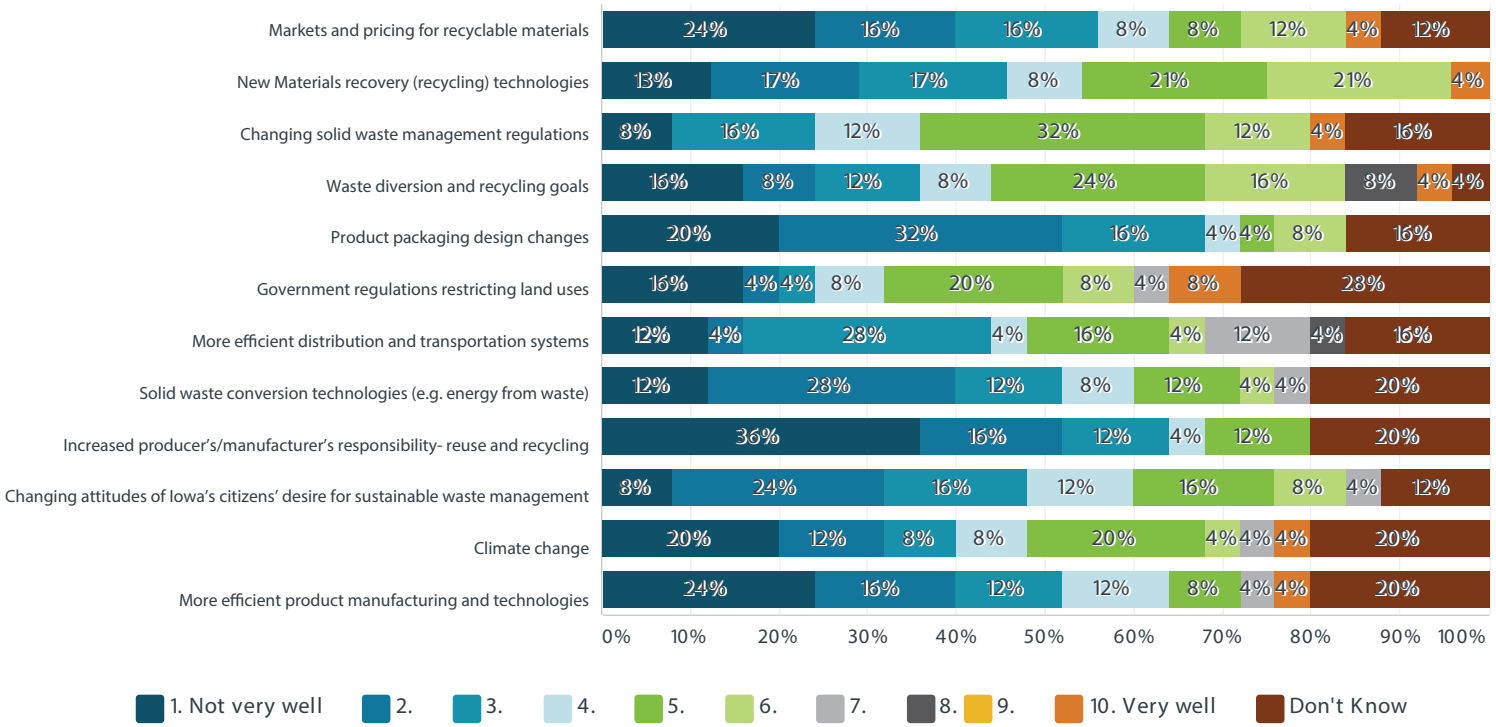
- Survey respondents considered markets and pricing for recyclable materials and product packaging design changes as the most important drivers of change in shaping the future of waste management in Iowa.
- The Iowa DNR Think-Tank is a significant step in identifying the gaps in current policy that will 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:

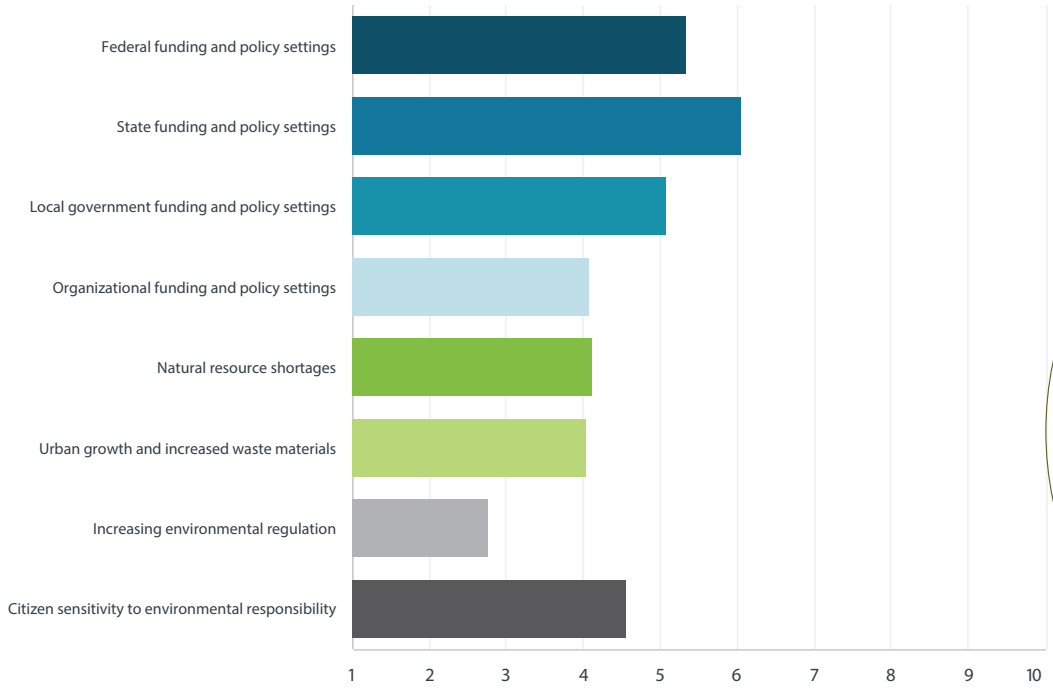
- Iowa was considered by survey respondents to not perform well in the area of increasing producers'/manufacturers' responsibility for materials reuse and recycling and product packaging design changes.
- Consumer and producer education will play a key role in helping the State of Iowa make the transition 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:

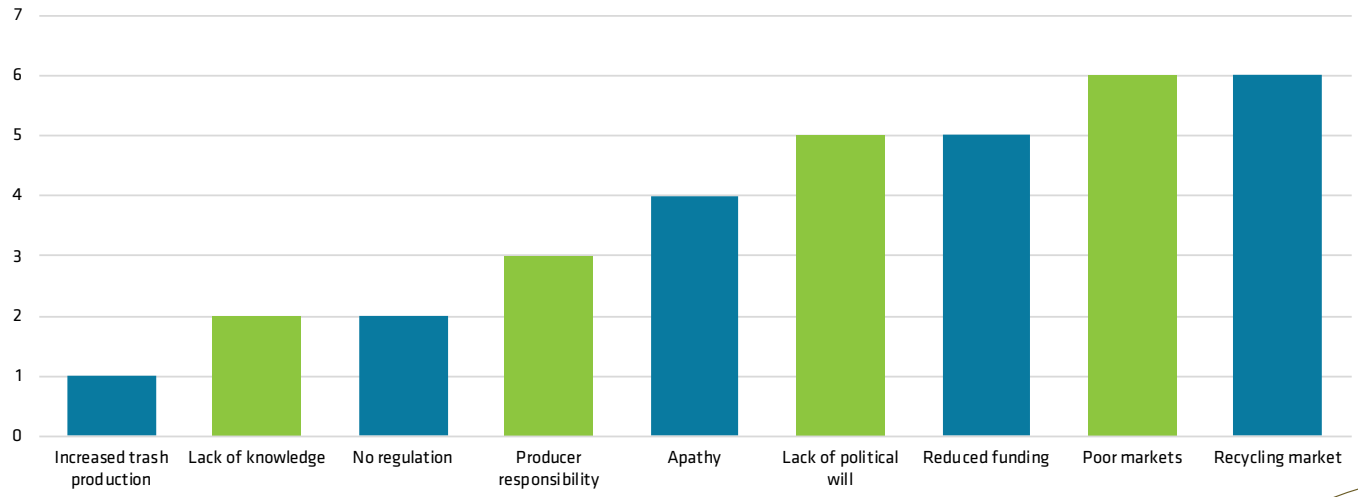
- All of the factors identified by the Iowa DNR were considered relatively important by survey respondents.
- Changes in citizen perceptions to environmental responsibility have been key elements in gaining support to alter the direction of integrated solid waste management towards sustainable materials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

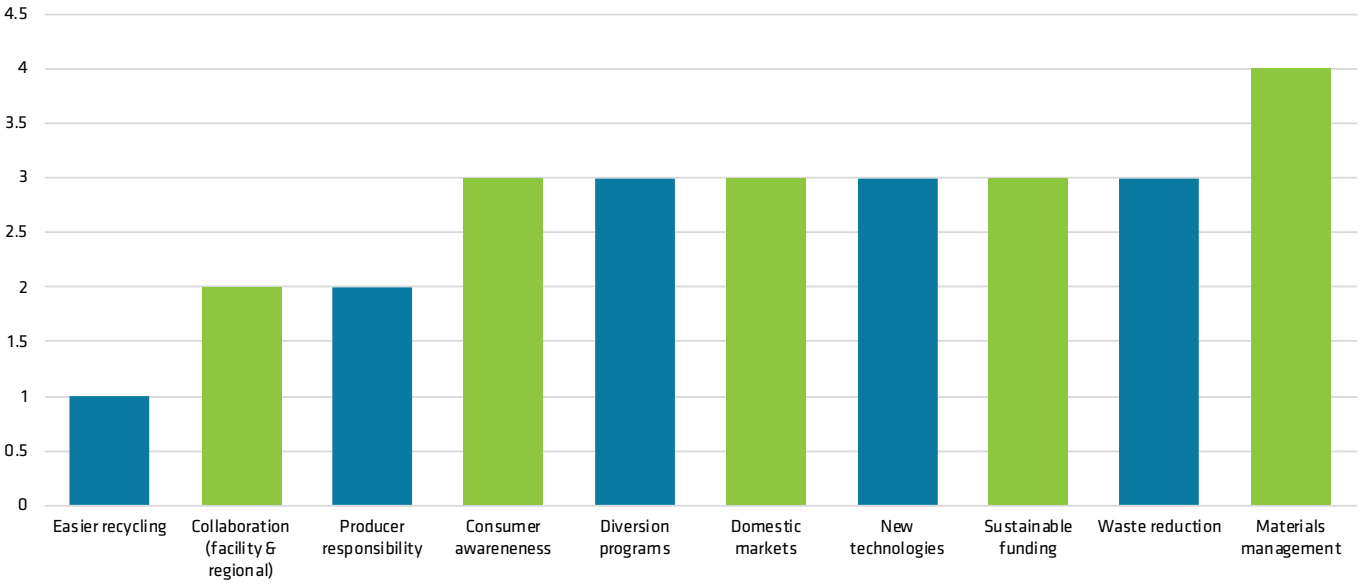
- Addressing perceived threats to waste management will take visible leadership in both public and private sectors in order to achieve the desired transition to sustainable materials management.
- The reliance on international markets for recovery and reuse of recycling products has weakened the U.S.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

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

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.

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

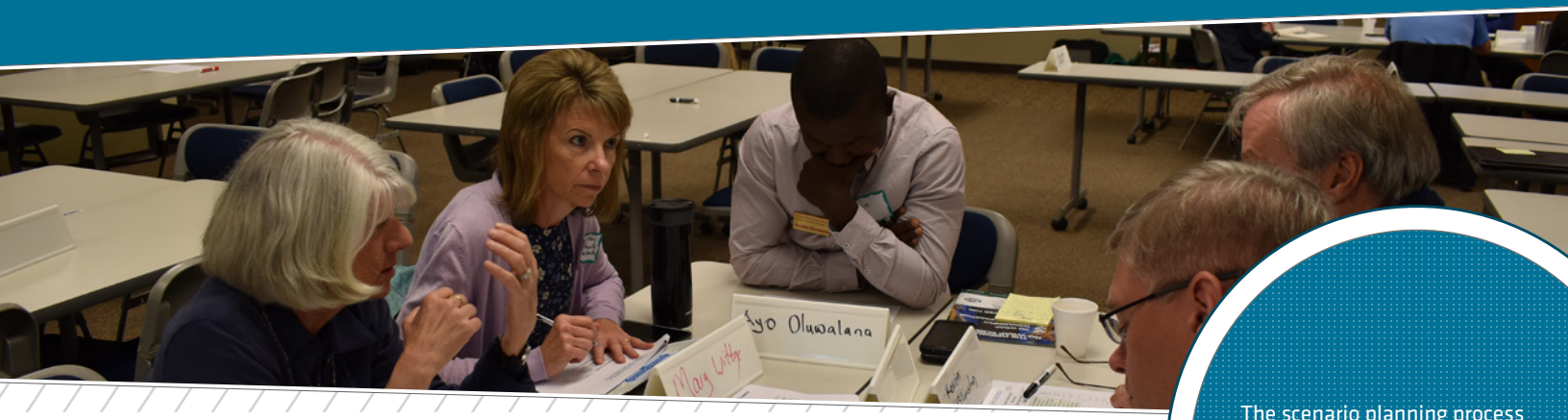
What do you think are the biggest opportunities facing waste management in Iowa in the future?



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.

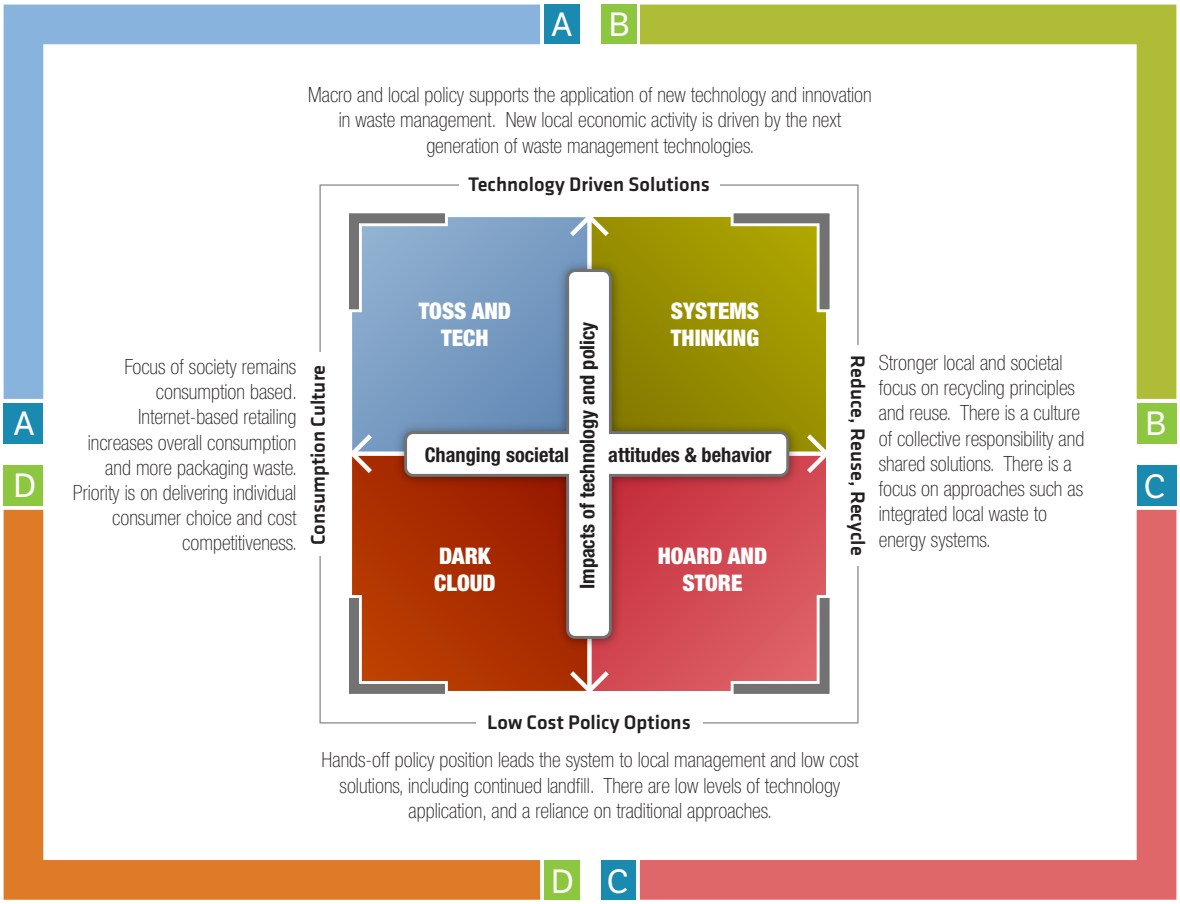
FUTURE-SPLITTING QUESTION

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

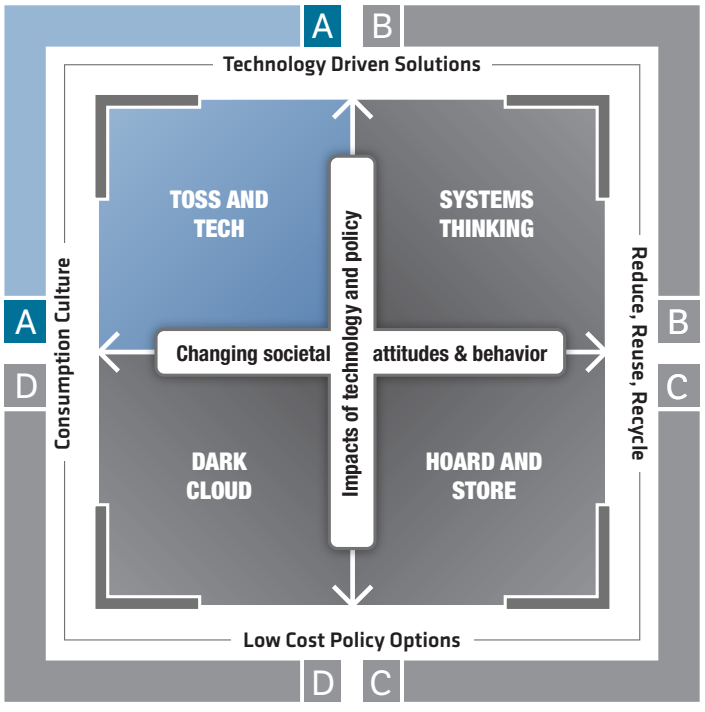
Based on the Pre-Think-Tank survey responses and key input from IDNR staff, themes were identified to become the basis for two axes on the scenario matrix. The two axes identified were **Changing Societal Attitudes and Behavior** and **Impacts of Technology and Policy**.

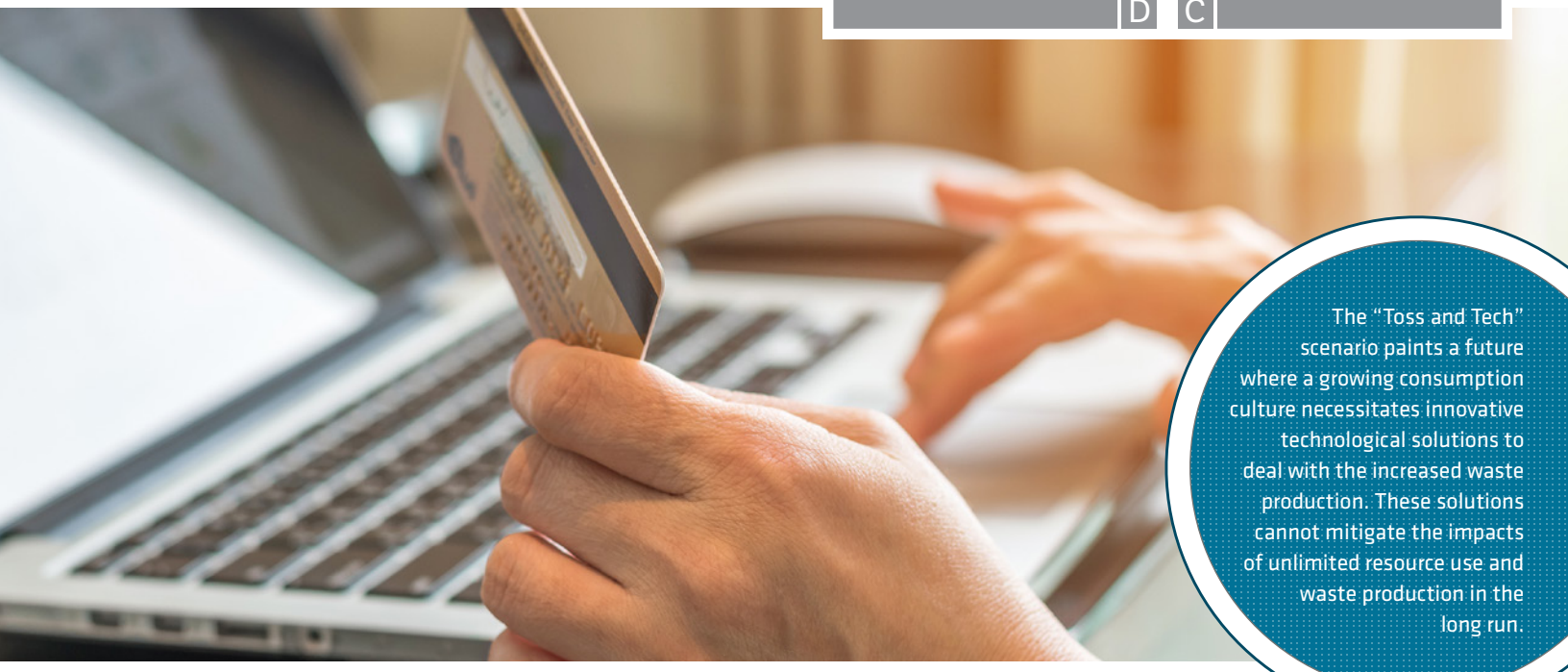
Think-Tank participants were presented with the scenario matrix, defined by the two major axes of 'Changing Societal Attitudes and Behavior' and 'Impacts of Technology and Policy' (see diagram). Brief descriptions were also attached to the end points of each driver axes. Participants were divided into 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:

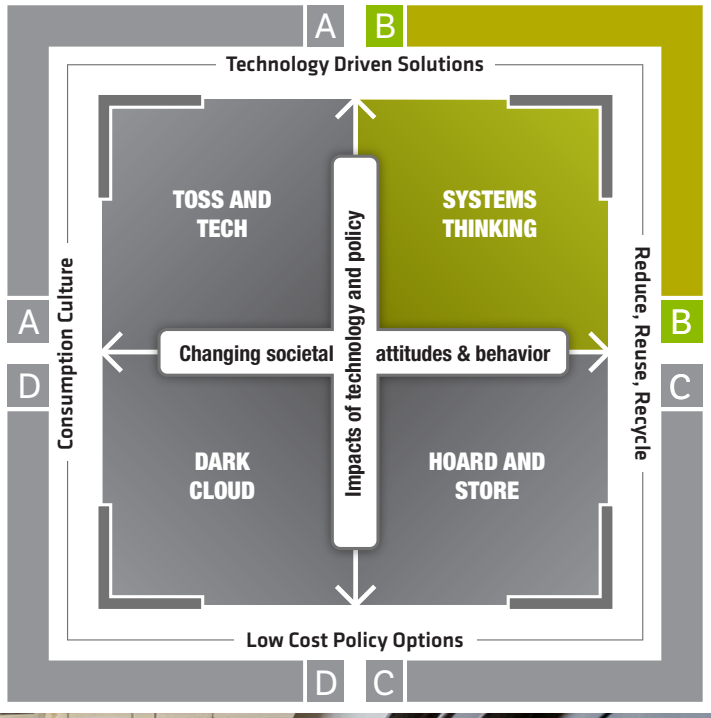
"Businesses and residents push back on new waste policy and fees"

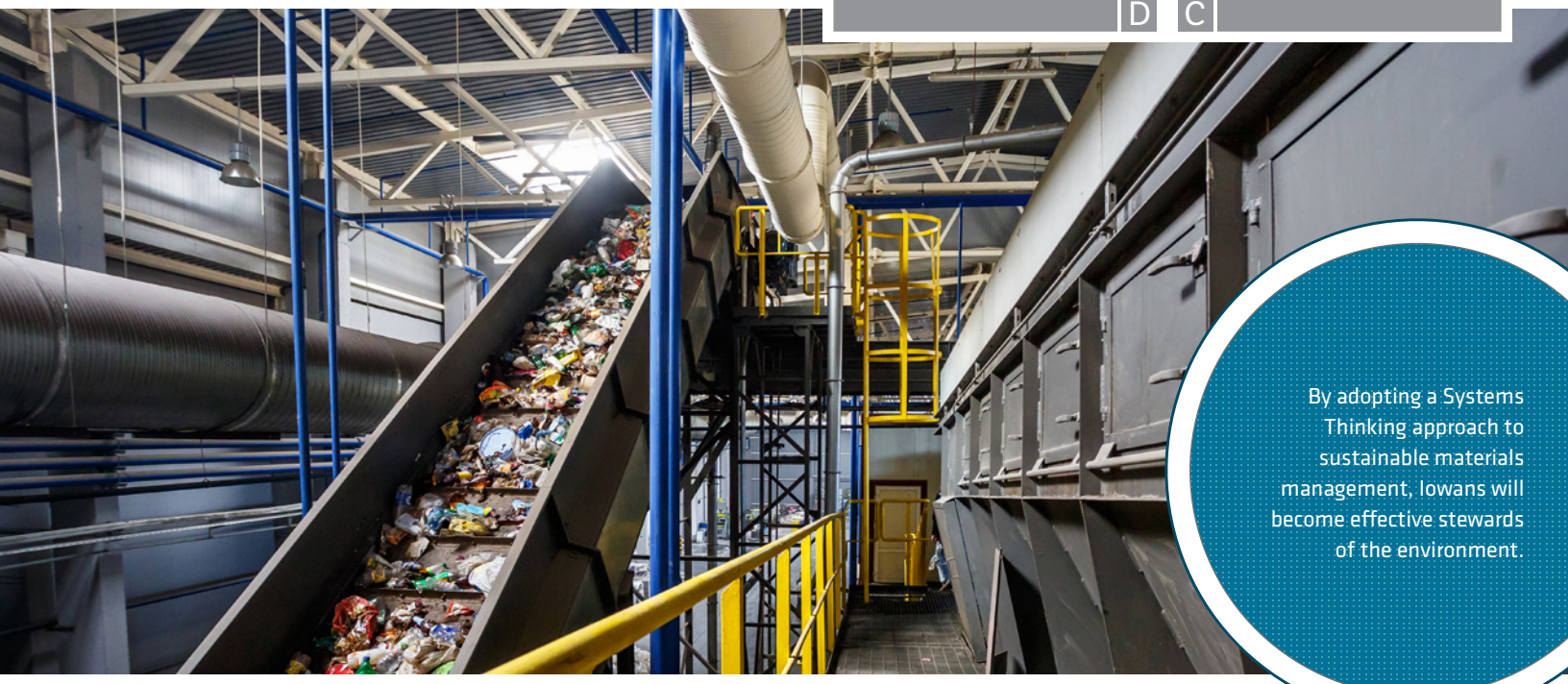
2030 HEADLINE NEWS:

"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:

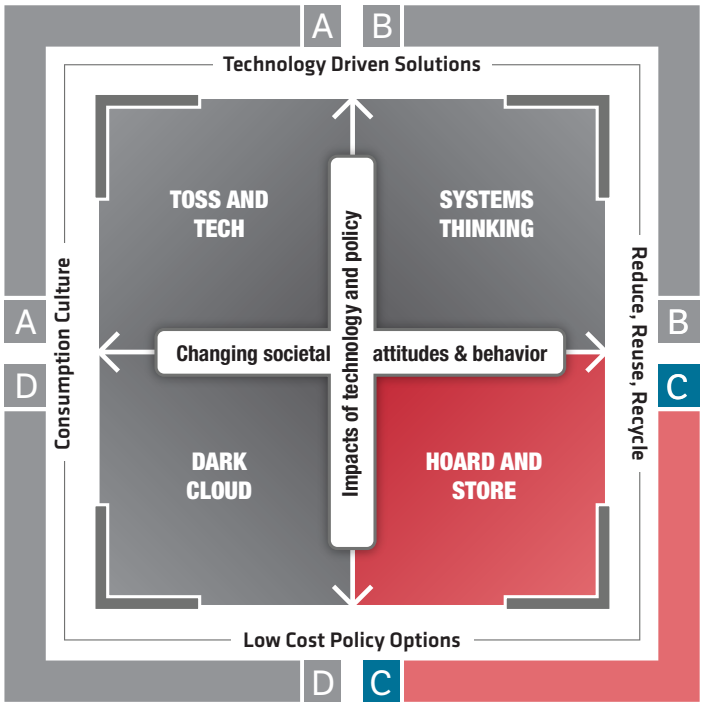
"Iowa replicates 'complete streets' approach to materials management"

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:

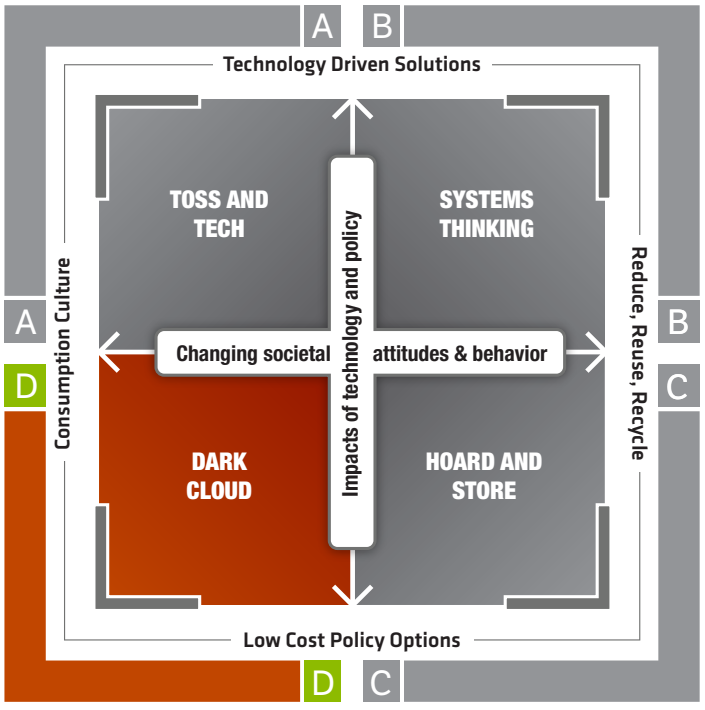
"Manufacturers respond to Iowans' demands for sustainable materials in packaging"

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"

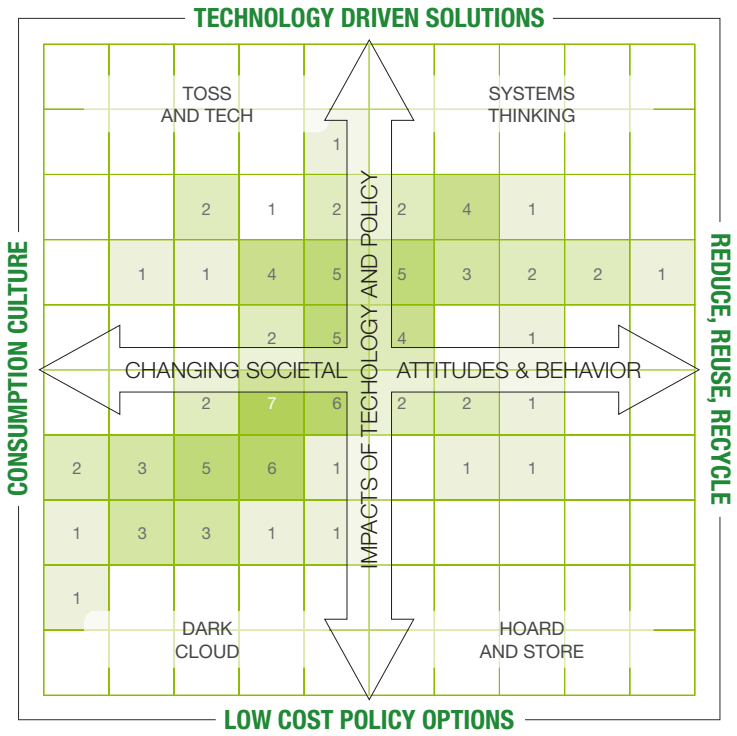
IDNR stakeholders were aligned around the common view of the expected future if no actions are taken to change societal attitudes and behavior around materials management in Iowa. This will take a quantum shift in education for consumers and producers.

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.

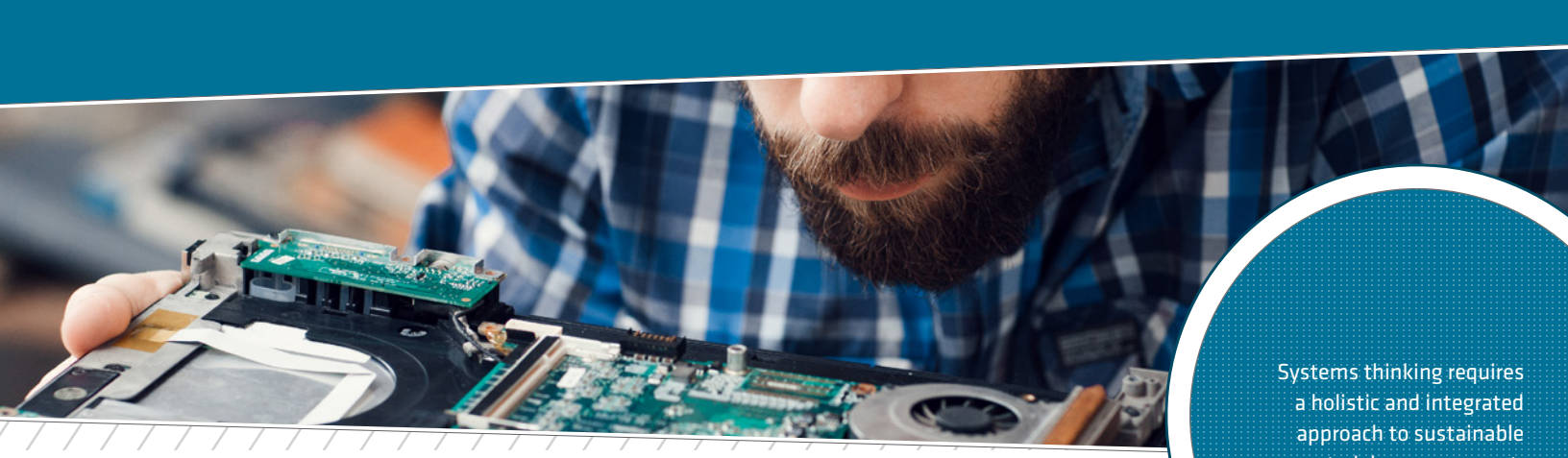
Iowa Sustainable Materials Management Think-Tank Heatmap



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.

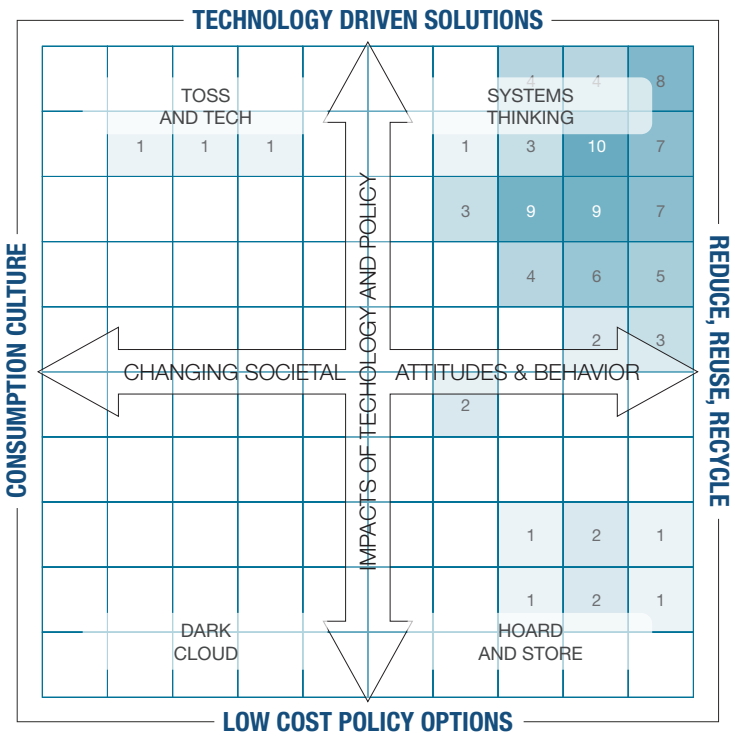


Systems thinking requires a holistic and integrated approach to sustainable materials management.

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.

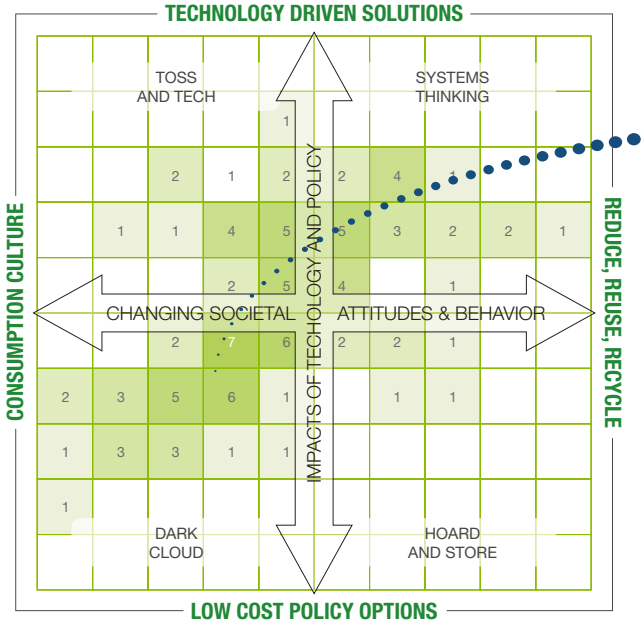
Because of the long-term nature of the Scenario Planning methodology, stakeholders often see the 'distant future vision (2030)' as unattainable and unrealistic. However, this underestimates the progress that can be made during the intervening years, and the cumulative positive impacts of change.

8.0 NEXT STEPS – GETTING TO THE PREFERRED FUTURE

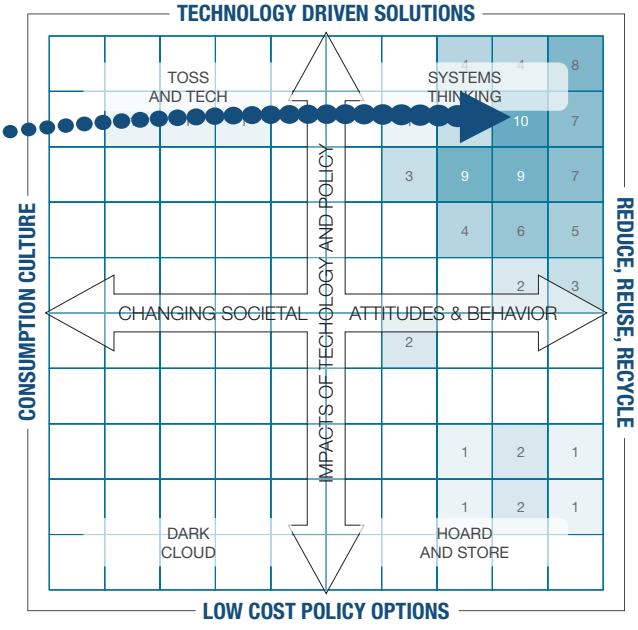
Think-Tank participants discussed the ramifications and implications of failing to achieve the preferred future. There was strong alignment among participants that Scenario B, "Systems Thinking" represented the preferred scenario for Iowa, with a recognition that the transition from integrated solid 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



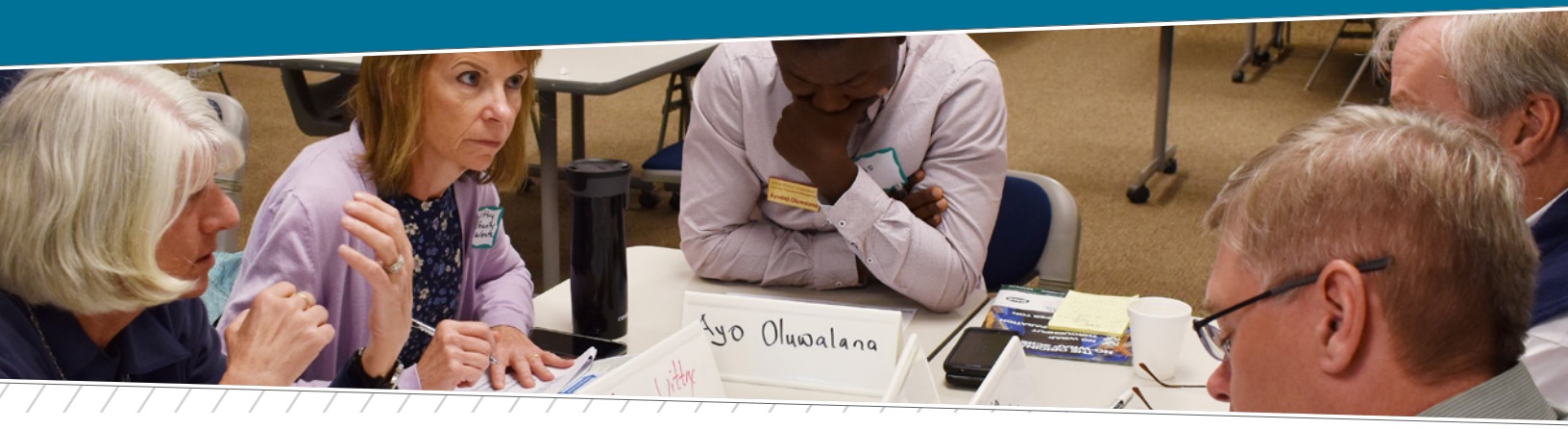
PREFERRED FUTURE – 2030



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

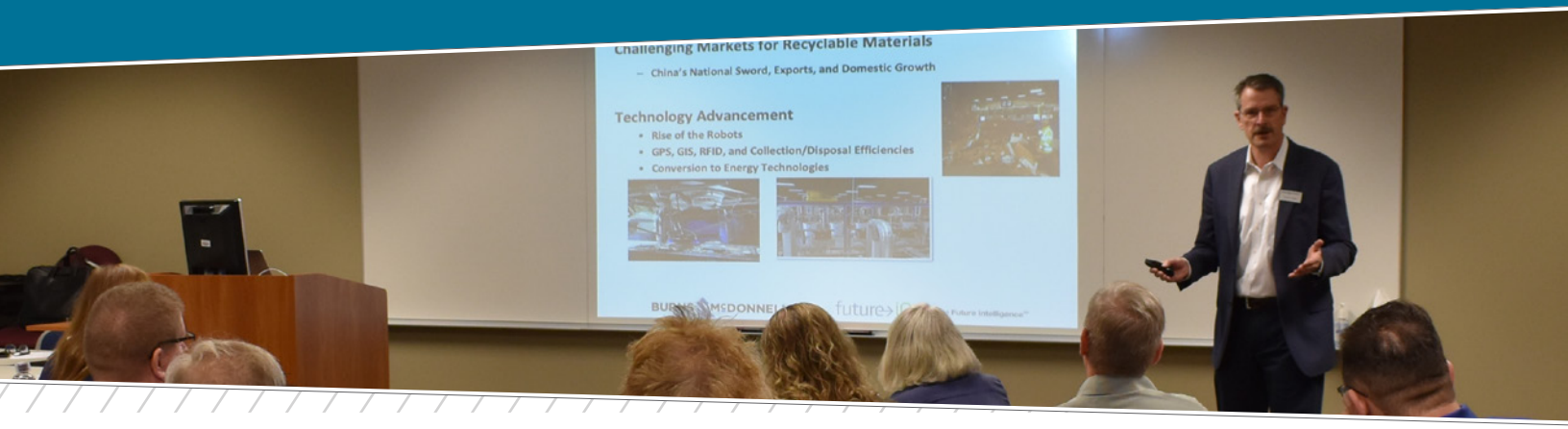
10.0 CONTACT DETAILS

For more information on the Iowa Department of Natural Resources and sustainable materials management Think-Tank, please contact:

Alex Moon, Bureau Chief
alex.moon@dnr.iowa.gov

Jennifer Wright
jennifer.wright@dnr.iowa.gov

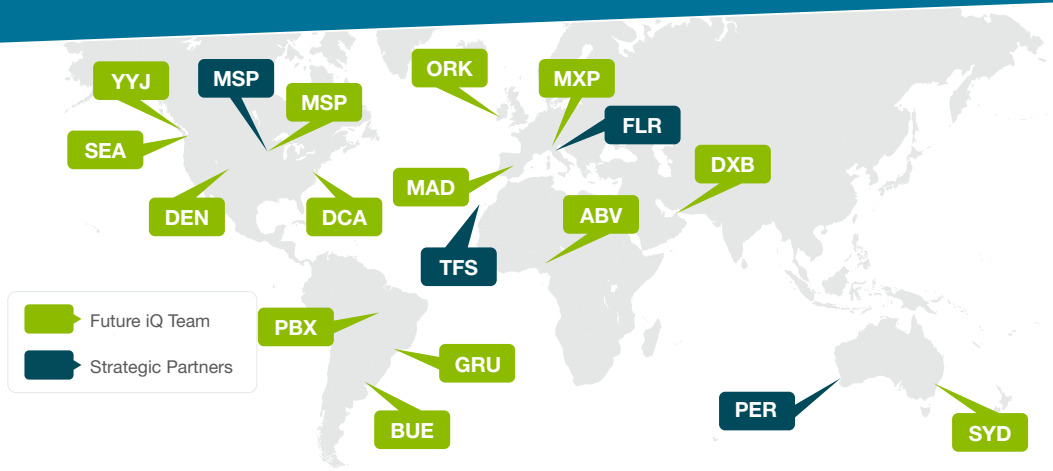
Tom Anderson
tom.anderson@dnr.iowa.gov



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.

Robert W. Craggs, Burns & McDonnell
Department Manager \ Solid Waste and Resource Recovery \ Environmental Global Practice
8201 Norman Center Drive, Suite 300
Bloomington, MN 55437
O: 952-656-3617
M: 651-503-3198
rwcraggs@burnsmcd.com
http://www.burnsmcd.com



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**

WORKSHOP AND REPORT PREPARED BY:

David Beurle

CEO, Future iQ

Heather Branigin

VP, Foresight Research

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

BURNS McDONNELL

DNR IOWA DEPARTMENT OF NATURAL RESOURCES