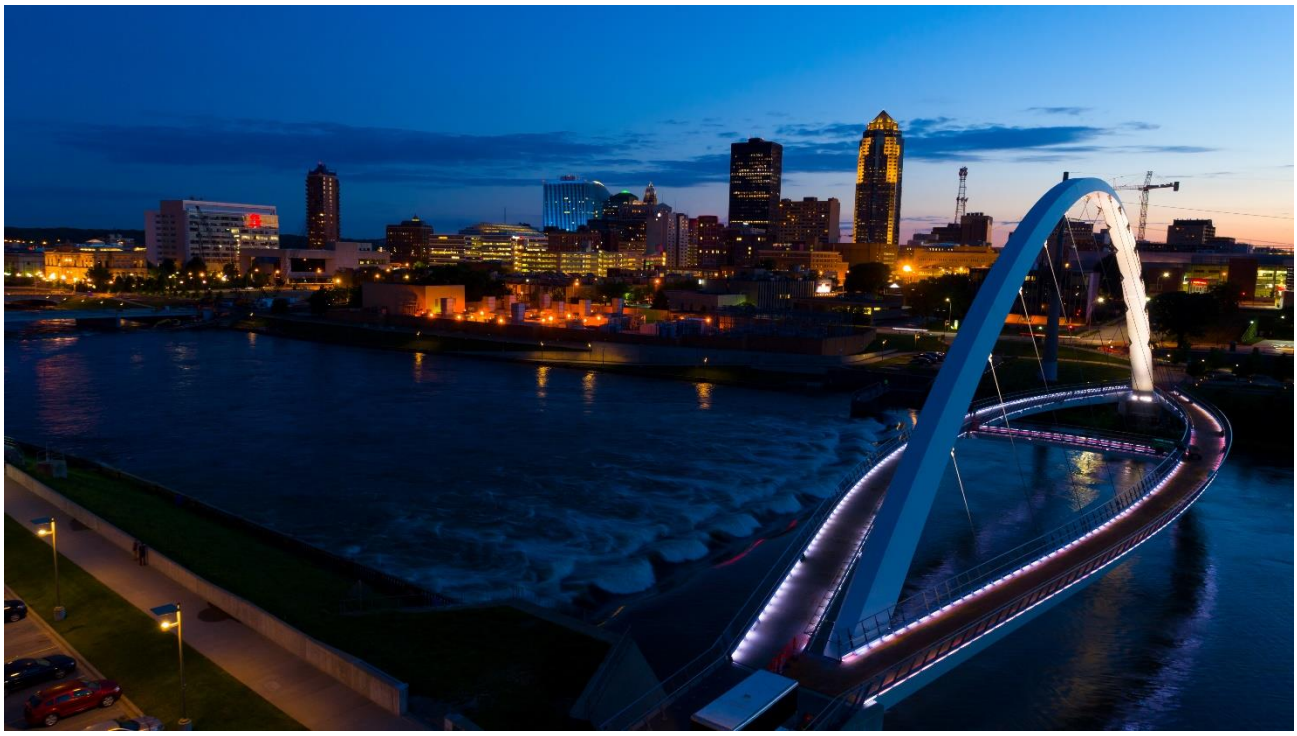
Benchmarking of Sustainable Materials Management Policies and Programs



IOWA DEPARTMENT OF NATURAL RESOURCES

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1.0 BENCHMARKING OF SUSTAINABLE MATERIALS MANAGEMENT POLICIES AND PROGRAMS

1.1 Introduction and Background

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) 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 Recovery	Sustainable Materials Stakeholder (SMM) Education	Container Deposit Laws	Product Stewardship
Minnesota	√	√	√	√	√		√
Vermont	√	√	√	√	√	√	√
Maine	√	√		√	√	√	√
Oregon	√	√	√	√	√	√	√
Tennessee	√			√	√		
Iowa				√		√	√

1.2 Summary of Sustainable Materials Management Programs And Policy Approaches

The waste diversion and reduction goals for each of the selected states and the state of Iowa are summarized below as frame of reference for evaluating various state programs.

Benchmarking Summary	
States	SMM Statewide Goal
Minnesota	75% Recycling Rate by 2030
Vermont	50% Diversion Rate by 2020
Maine	Recycle or Compost 50% of MSW Annually
Oregon	55% Solid Waste Recovery by 2025
Tennessee	47% Reduction in Per Capita Rates by 2025
Iowa	50% Landfill Reduction Goal

The specific information gathered in this benchmarking analysis for each selected state is organized into the following categories for comparative purposes. Please note there may be some overlap between sections in describing the respective state programs.

- Planning
- Measurement
- Programs
- Funding

1.2.1 Minnesota

1.2.1.1 Planning

Minnesota has a long history of waste diversion and materials recovery. In 2015, the Minnesota Pollution Control Agency (MPCA) defined its commitment to sustainable materials management (SMM) with the 2015 Solid Waste Policy Report. The policy report's approach to materials management helped transform end-of-life management of materials to maximizing the usefulness of a material throughout its life-cycle based on the principals of SMM. The plan highlights the vision for SMM in the context of previous financial analysis, waste stream characterizations, recycling studies, life-cycle analysis studies, and previous policy. Recommendations for future policy, measuring, stakeholder engagement, and goal setting tools are outlined in the report. The challenges associated with these changes are also explored.

The Metropolitan Solid Waste Management Policy Plan 2016 – 2036 established a SMM plan specific to the Twin Cities Metropolitan Area (TCMA) and was adopted in April of 2017. Similar to the state's plan from 2015, the report examined the current state of solid waste and recycling using various studies, including a study addressing environmental justice.

A vision and framework for change was developed by the MPCA, with the input of seven Metropolitan Counties and other stakeholders. The plan identified the responsibilities that stakeholders will bear in transforming the solid waste management system. Four groups of stakeholders were identified: product producers, government, waste generators, and waste management businesses. These stakeholders outlined the strategies that they would implement to achieve a shared 75% recycling rate goal. All stakeholders in the system have roles and responsibilities to ensure successful implementation of these strategies. An accountability plan was developed and included in The Metropolitan Solid Waste Management Policy Plan 2016 – 2036 for the implementation of strategies of each stakeholder.

1.2.1.2 Measurement

Both plans also identify new measures of success to better analyze SMM programs. Traditionally, success was measured by comparing recycling or diversion rates, however, this method has its shortfalls. For example, given a producer's transition from corrugated cardboard (OCC) boxes to reusable transport containers, there would be less OCC recycled, and lower overall recycling rates. Lower recycling rates

have historically indicated unsuccessful programs. The 2015 plan directs Minnesota to use capture rate (the amount of a specific material that is captured, relative to the total amount of the specific material that is generated) to measure the success of recycling programs and policies. The MPCA has recommended individual material capture rate goals be set for various recyclable materials in order to achieve the TCMA recycling rate of 75%.

Along with new measurement tools, the plans identify the need for analysis as a tool to inform policy decisions. Case studies, material life-cycle analyses (LCA), and waste characterization studies have since been completed to identify a baseline for policy decisions. LCA studies analyze product impact throughout the life-cycle (production, use, reuse, end-of-life) and allow programs and policies to prioritize the specific impacts of a material. The major policy developments that these studies helped to inform include recycling market development, product stewardship, and food waste recovery.

1.2.1.3 Programs

Minnesota has since begun implementing those programs. An active recycling market development coordinator helps industry professionals to connect via a network of business, government and non-profit organizations. Product stewardship laws have been adopted, or are currently being developed, for carpet, mercury lamps, batteries, paint, and mattresses. Minnesota aims to divert or reduce a majority of food waste via compost, anaerobic digestion, and individual household food waste reduction. The Metropolitan Solid Waste Management Policy Plan 2016-2036 states that all TCMA municipalities will offer curbside organic recycling collection by 2025. The plan sited statutory precedent requiring organics collection where “communities that are currently required to provide curbside recycling under 115A.552 Opportunity to Recycle should be required to offer curbside organics collection”. The plan highlighted that side-by-side curbside organics and recycling collection “will be necessary if the 75% recycling goal is to be achieved”.

Educational efforts to inform generators and other stakeholders of their responsibility within a SMM system have been a focus of the MCPA. Notably, recycling and composting requirements are displayed on collection containers and a number of outreach activities have been developed to engage citizens in SMM programs.

The MPCA also is collecting more data on items like statewide access to organics collection, energy impacts of materials, financial needs of communities. Annual reporting is required to receive funding. This data will help to better assess programs and policies.

1.2.1.4 Funding

Minnesota's funding structure has changed over the years. Currently, the Solid Waste Management (SWM) Tax is collected by solid waste service providers and remit to the Minnesota Department of Revenue. SWM tax rates vary depending on the type of waste, and generator. The table below displays the SWM tax rates for various generators.

SWM Tax Rate	
Mixed Municipal Solid Waste (1)	
Residential	9.75% of sales price
Commercial	17% of sales price
Self-hauler	17% of sales price
Non-mixed Municipal Solid Waste (2)	
Construction and demolition debris	60 cents per cubic yard or $2 per ton*
Industrial waste ("per ton" rate is subject to change)	60 cents per cubic yard or 46.2 cents per ton
Infectious and pathological waste	60 cents per cubic yard or .004 cents per pound

(1) garbage, refuse, and other solid waste from residential, commercial, and community activities.
(2) construction, demolition, industrial, infectious and pathological waste material that's collected, processed, and disposed of separately from mixed waste.
* The commissioner of Revenue, after consultation with the commissioner of the Pollution Control Agency, shall determine and may publish by notice a conversion schedule for construction debris.

Programs at the MPCA are funded with most (70%) of the revenue collected by this tax, including solid waste and landfill cleanup activities. The remaining 30% of this tax revenue presently goes to the General Fund. Counties receive MPCA program dollars via Select Committee on Recycling and the Environment (SCORE) fund. All counties with an approved Solid Waste Management Plan and compliant annual SCORE reporting receive a minimum SCORE payment, with remaining funds distributed based on county population. $17.25 million has been allocated for SCORE distribution annually. Additionally, grants are awarded based on program objectives and annual initiatives.

1.2.2 Vermont

1.2.2.1 Planning

Building on Vermont's 2012 Universal Recycling Law, the Vermont Department of Environmental Conservation (VDEC) finalized its Materials Management Plan (MMP) in 2014. The plan outlined a vision with the goals to prevent waste from being generated, promote the highest and best use of material,

minimize the reliance on waste disposal, conserve resources, reduce energy consumption, and reduce Greenhouse Gas (GHG) emissions.

The vision plan was driven by the following legislatively mandated goals, per VT statute 10 V.S.A Section 6604a.:

- Expanded education and outreach to schools, businesses, and the general public
- Extended producer responsibility & product stewardship
- Reduction in the statewide disposal rate (pounds per person per year)
- The reuse, recycling, and composting of materials to reduce the amount needing to be landfilled
- Reduction of toxicity in the waste stream
- Improved availability of statewide infrastructure and services for waste reduction and diversion (strive for convenient, consistent, and cost-effective services)
- Improved measurement and progress of performance standards
- Development of sustainable financial structures to manage materials

Analysis was completed to identify categories of recyclable materials that would allow for the prioritization of the specific policy approaches necessary to achieve these goals. Recyclables, organics (biosolids, bioproduct residuals, food waste, etc.), construction and demolition materials, household hazardous wastes (HHW), sludge, septic, and residual wastes, were identified. Material specific goals were identified for these materials. The plan outlines six tools for action:

- Public Outreach and Education,
- Product Stewardship,
- Government Leadership,
- Infrastructure Improvements,
- Disposal Bans, and
- Performance Standards.

With these goals in mind, the 2014 MMP outlines performance standards that are action oriented. Stakeholders were involved in the development of the MMP through a public comment period and through engagement in various working groups for materials management within the state. The VDEC is tasked with reviewing and redrafting the MMP every five years and are currently in the updating process for the 2019 MMP. Vermont Statute 24 V.S.A. Section 2202a requires municipalities to provide their own Solid Waste Implementation Plans (SWIPs) to be in conformance with the state plan.

1.2.2.2 Measurement

Vermont requires annual reporting from local Solid Waste Entities to measure improvement via diversion and disposal rates. These reports will allow the state to determine the local needs for technical assistance. The Universal Recycling Law requires that the state analyze and report the state of recycling markets, in order to assess and prioritize policy decisions.

1.2.2.3 Programs

Since adoption of the SMM approach, Vermont implemented a food waste reduction program to collect food scraps for compost and anaerobic digestion. Starting July of 2020, food scraps will be banned from municipal solid waste (MSW) landfills. The program also promotes the collection and distribution of excess food to donation centers. Vermont's Residuals Management and Emerging Contaminants Program establishes the goals to divert organic residuals from municipal and industrial processes.

Food scraps are just one of many materials that Vermont has mandated for landfill diversion. As mentioned previously, Vermont passed a Universal Recycling Law in 2012. According to the VDEC, "The Universal Recycling law seeks to improve the capture and diversion rates for these valuable materials to prevent them from being landfilled". The law phases out landfilling recyclables, food scraps, and leaf and yard debris, and aims to ensure collection of these materials coupled with incentivizing diversion through "pay-as-you-throw" fee systems.

Vermont has recognized the need to help stakeholders comply with mandated diversion. An online Universal Recycling Map tool connects waste and recycling generators to haulers, recycling facilities, composters, food rescue organizations, and other diversion mechanisms. A related recycling market development tool was developed to estimate the tons of food waste that sources are projected to generate.

Product Stewardship programs give product generators additional responsibility for sustainable management, use, and end-of-life consumption of materials such as batteries, e-waste, paints, and mercury containing products.

Vermont's Beverage Container and Redemption Laws (Bottle Bill) approaches diversion differently than the Universal Recycling Law. Instead of mandating material diversion, the Bottle Bill offers an incentive to consumers to divert material. When a covered bottle or can is deposited at redemption centers, consumers redeem a deposit. In 2013, a systems analysis was completed to compare recycling rates under the Expanded Bottle Bill to rates prior to any container law. Results showed that material collection rates under the Bottle Bill improved for all materials.

Similar to Minnesota, Vermont uses studies and reports like these to further inform policy decisions. An extensive database of studies and reports includes: 2019 Biennial Report on Solid Waste, 2019 Report on Battery Stewardship, 2018 Vermont Waste Characterization Study, CPI Backyard Composting Survey, Textiles Reuse & Recycling in Vermont, and a variety of stakeholder group publications.

1.2.2.4 Funding

Per discussions with VDEC staff, it was explained that about $500,000 are available annually to assist municipalities with the completion of the requirements of the MMP. Grants are awarded based on population and number of municipalities in each respective region. The VDEC's Solid Waste Program is funded by a surcharge fee of $6.00 per ton.

1.2.3 Maine

1.2.3.1 Planning

The Maine Department of Environmental Protection (MDEP) updates its Solid Waste Management and Recycling Plan every five-years and conducts a biennial Waste Generation and Disposal Capacity Report to inform the planning process via legislative guidelines. During the development process of each plan update, an Advisory Committee - made up of public, private, and non-profit solid waste program and policy organizations - assist MDEP staff. Together, the MDEP and the Advisory Committee determine priorities based on waste generation trends, changes in waste recycling and disposal technologies, development of new waste generating activities, and changes in policy approach (such as the shift to SMM). Action strategies are identified in the plan to address these priorities. The most recent report update was completed in 2014.

The 2012 Waste Generation and Disposal Capacity Report found that the combined MSW, construction and demolition debris (CDD) and land clearing debris recycling rate of (39.6%) did not meet the state's waste diversion goal of 50%. To reach this goal, the MDEP elected to transition to a SMM approach with the 2014 plan update. The following priorities were identified:

- Encourage the development of new infrastructure for separation from the waste stream and utilization of organics, including composting and technologies such as anaerobic digestion.
- Encourage increased beneficial use and recycling of materials, including identification of incentives and removal of unnecessary barriers.
- Provide tools and assistance to municipalities and businesses to support waste reduction and diversion efforts.

- Continue refinement of data sources and data management systems to more accurately and consistently assess progress toward statewide reduction and recycling goals, and to evaluate the effectiveness of programs and strategies.

1.2.3.2 Measurement

There are no mandatory reporting requirements for quantities of materials disposed to landfills, diverted to recycling facilities, or composted. MDEP has complied a database of voluntary reports. Natural Resource Council of Maine (NRCM) staff identify this as a challenge the state faces when assessing the success of their programs. The NRCM is an environmental non-profit advocacy and policy group that has worked to introduce SMM policies at the Maine legislature. Several NRCM staff are members of the MDEP Advisory Committee.

1.2.3.3 Programs

Maine has implemented a food waste recovery program that aims to promote diversion of food waste to composting, anaerobic digestion facilities, and food rescue programs. MDEP does this via a dedicated staff who offers technical assistance for composting operations and organic recycling permitting. Recent grants have targeted organics management across 6 project sites.

Maine also has a container deposit law (Bottle Bill) that has brought success to its recycling program. The program achieves an estimated 90% collection rate for plastic, glass, and aluminum bottles and cans. As the NRCM explains, bottle bills are not only a valuable SMM tool due to the increased recycling rate, but also for the source separation of materials. PET plastic is a material that can be recycled many times during its life-cycle. Recovery of PET can reduce energy consumption in the production of PET containers. Aluminum is one of the most energy intensive materials to mine and manufacture. High recovery rates, due to Bottle Bill collection activities, reduce the need for natural resource extraction for the production of virgin aluminum materials. Glass materials traditionally have limited recycling markets due to the single-sort glass recovery technology. However, due to the source separation through the Bottle Bill, Maine extends the end-of-life usefulness of glass material for use in production of new products.

Other product stewardship laws have addressed the production, use, and end-of-life sustainability for e-waste, batteries and cell phones, light bulbs, and thermostats. NRCM staff indicated that product stewardship for packaging with be a focus in the near future.

Web based Toolkits are provided by the NRCM to encourage individual citizens, municipalities, and solid waste organizations to participate in a SMM system. For example, the “Pay-As-You-Throw” Toolkit,

educates citizens on the merits of a PAYT collection method, and offers municipalities examples of other communities with PAYT programs, sample ordinances, publication templates, and Sustainability Initiative Seed Grant applications. The toolkits provide a "one-stop" web portal for communities to access technical and financial support.

1.2.3.4 Funding

The MDEP Solid Waste Program is funded using state allocated funds, environmental fees associated with the purchase of tires and car batteries, licensing and annual reporting fees, and surcharges on landfill tipping fees. The State of Maine levees a $2 per ton surcharge on all solid waste disposed of in permitted landfills.

1.2.4 Oregon

1.2.4.1 Planning

Of the states that were reviewed in this benchmarking evaluation, Oregon has the most extensive detail into the planning process behind their SMM visioning plan, the Materials Management in Oregon – 2050 Vision and Framework for Action. Developed in 2012, the plan's objective is to create a foundation of goals and measuring outcomes based on supporting material life-cycle analysis. From this foundational work, policies and regulations have been enacted to achieve goals based on sound research and adequate program funding. Collaborations with state agencies, business and local organizations aim to improve material life-cycle sustainability. Educational programs engage stakeholders in the system in order to improve successful participation in new and existing SMM programs.

The planning process supporting this plan was extensive, and components of the Oregon Department of Environmental Quality (DEQ)'s approach has been modeled by others. In 2011, a workgroup was convened with stakeholders representing municipal leadership, state officials, businesses, and solid waste and recycling organizations. The group developed a 2050 vision and determined the framework and action steps necessary to achieve it. The framework for action was defined:

- *Foundations*. This work will create the solid foundation necessary to achieve the 2050 Vision. Foundational work includes setting goals and measuring outcomes, supporting and performing research, and securing stable funding.
- *Policies and regulations.* DEQ will evaluate and develop policies and regulations that put Oregon on the path toward achieving the 2050 Vision.

- *Collaboration and partnerships*. Coordination throughout the lifecycle of materials and products will support innovative solutions. DEQ will collaborate with other state agencies, businesses, local governments and nongovernmental organizations.
- *Education and information*. DEQ will share information it develops with partners for distribution to appropriate audiences.

The 2050 vision was itself structured in its definition. The 2050 conceptual goals are grounded in SMM principals and are defined by their material life-cycle impacts. Specific vision goals were developed in the context of the three stages of a material's life cycle:

- Upstream, Design and Production
- Consumption and Use
- End-of-Life Management

The 2050 goals were then analyzed in the context of these stages in 2012 using data derived from Waste Characterization, LCA, and other studies. Based on this analysis, the Department of Environmental Quality has set individual program goals and an interim 2025 statewide goal of 55% diversion.

1.2.4.2 Measurement

The framework and goal setting structure that Oregon provides the framework for the state to leverage LCA and similar studies to assess program success. Annual reporting also helps the state evaluate and measure performance against prior reporting and research. Analyses such as these will provide planners the insight to focus on specific materials and programs to help achieve the 2025 short-term diversion goal and the 2050 vision. Packaging, food products, building materials, and other materials were identified as critical materials for action. Well-focused research has helped Oregon implement successful food waste, product stewardship, recycling market development, and related educational programs to divert these materials.

1.2.4.3 Programs

Food reclamation is priority for the DEQ. Both the 2050 Vision and the Oregon Global Warming Commission's Interim Roadmap to 2020 identify wasted food prevention as a priority material. This focus is based primarily on the estimated combined environmental burdens of food production, distribution, refrigeration, preparation and final disposal. To address food waste in Oregon, a detailed Food Waste Prevention Strategy was developed, based on a wasted food measurement study. Food rescue partnerships with local organizations redistribute edible food waste. Organics unable to be diverted for consumption are encouraged to be collected for composting and anaerobic digestion. The state requires

detailed materials feedstock reporting during the permitting process for organic composting and anaerobic digestion, to better optimize material reclamation and energy recovery.

The DEQ has implemented an extensive stakeholder engagement process with facility operators, recyclable materials end users, generators, and the public to more effectively participate in SMM. Online resources are provided for local leaders to engage citizens. Tools include research reports, education plans, to multi-tenant recycling engagement strategies. For businesses, recycling market stakeholder meetings are conducted, along with market assessment reports, and a resource database. Education and outreach programs conducted by the DEQ help to educate individuals to recycle more effectively.

As with other states, Oregon has product stewardship laws for several materials including carpet, paint, electronics, and other materials. The state has followed through with its commitment to develop industry partnerships through business advisory committees for certain material and packaging types. Bottle Bill and Rigid Plastic Container Laws have increased recycling rates for containers for a variety of materials, such as PET, aluminum, and glass.

1.2.4.4 Funding

Securing funding was identified in the 2050 vision plan as the foundation needed to achieve state goals. Currently a landfill tipping fee surcharge funds all materials management programs. Surcharges cannot exceed $1.18 per ton but vary depending on the type of and amount of materials disposed. The DEQ awards project grants on a yearly basis for any project that reduces waste generation, promotes reuse, or recovers solid waste through recycling, composting or anaerobic digestion. These projects might include changing processes or materials to prevent waste, creating reuse infrastructure, processing and other waste prevention, recycling, composting and waste recovery initiatives. Grants for non-profit and government organizations have been approximately $500,000 annually. Some recent awards have included micro-grants to small businesses for work-force development for organics recycling facilities.

1.2.5 Tennessee

1.2.5.1 Planning

The Tennessee Department of Environment and Conservation (TDEC) is another organization that put stakeholders at the forefront of its planning process. As part of the development of the SMM plan, a series of three stakeholder engagement sessions were convened throughout the state. In each set of sessions, stakeholders representing businesses, municipalities, consumers, and waste generators offered their opinions publicly to identify key issues with sustainability. During this time, public comment was available online. The TDEC also convened an internal stakeholder meeting and provided information as

part of the Plan's development. To ensure adequate feedback was received from groups that seemed under-represented in the public meetings, two online surveys were administered targeting Tennessee businesses and municipalities. Larry Christley, a program manager with the TDEC, was intimately involved with this process and provided the planning process details for this report.

The first public engagement session identified key issues the state of Tennessee should address to reach the goal of waste reduction. Four public meetings were convened and gave opportunity for the public to identify important themes and priorities they preferred to see incorporated into any new statewide plan.

A second round of public meetings was conducted in order to set objectives and strategies for the upcoming plan, in the context of the key issues. In these meetings, TDEC technical staff presented issues and strategies that had been identified in previous meetings. Stakeholders were asked to engage with TDEC staff and select issues that should be identified in the plan.

In the third series of stakeholder engagement sessions, a draft plan was presented to stakeholders for public comment and approval.

Tennessee's SMM policy guidance was implemented with the 2015 - 2025 Solid Waste and Materials Management Plan. The plan had eight major objectives:

- update goals and measurement tools for the state to gauge material management success,
- increase access and participation to recycling programs,
- enhance recycling processing and end markets,
- increase organic diversion,
- support new diversion technology,
- expand outreach and education of stakeholders,
- ensure efficient and environmentally sound disposal, and
- develop funding for SMM.

Within the plan, the TDEC identified and analyzed the need to transition from an ISWM approach to a SMM system. In this analysis the plan recognized the political and economic challenges associated with the current system and the transition to a new vision. To address these concerns, the plan outlined the legal authority of the plan based in the context of Tennessee's statutes. Securing sustainable funding was also a priority of the plan, as defined in the eight objectives.

Analysis was conducted within the report to identify the current economic impact of recycling within Tennessee. The economic benefits of increased waste diversion were highlighted in the plan. Waste

characterization studies categorized MSW, C&D, and recycling streams to prioritize materials, account for imported waste streams, and quantify the value of materials currently being disposed.

With the present challenges and opportunities considered, Tennessee set a goal to reduce waste from 5.17 pounds per person per day to 3.5 pounds per person per day by 2025.

1.2.5.2 Measurement

The TDEC prefers to measure its waste reduction goal as the pounds disposed per person per day, due to the perceived advantages of allowing for population growth and eliminating the need for a comparison to a base year. The plan called for linking per capita reductions to future planning, as well as grant initiatives. Annual reporting will continue to ensure consistent measurement and assessment.

1.2.5.3 Programs

Since implementation of the plan, the state has made a focused effort to encourage organics recycling. Educational resources are available for individuals to compost food and organic material at their homes. The TDEC offers grants for municipalities and non-profits to participate in organic collection, composting, and anaerobic digestion. Grants are also available for other local waste reduction programs.

Similarly, technical assistance on waste reduction and recycling is provided to counties, municipalities, policy makers, solid waste industry, recycling industry, and residents. The TDEC will evaluate Regional Solid Waste Plans, identify equipment needs, provide solid waste and recycling infrastructure design, and refer issues to technical assistance providers.

Grant and technical assistance programs help to support drop-off sites where residential collection is not feasible (rural areas) and enhance curbside recycling in locations with poor diversion rates. In this way, the needs of individual communities are addressed. Similarly, market development tools are recommended in the plan to help foster local improvements in recycling collection, recovery, and marketing to end users.

Tennessee bans the disposal of whole tires and used oil to landfills. Grant programs help fund the beneficial use of tires. A used oil collection program is funded by the state. Collected oil can be re-refined to lubricant quality motor oil, burned for energy recovery, or burned in specially designed space heaters.

1.2.5.4 Funding

TDEC funding prior to the 2015 – 2025 plan has been through a variety of mechanisms. The primary funding source for the Solid Waste Assistance Program is a $0.90-per-ton tipping fee surcharge on municipal solid waste disposed in landfills. However, additional revenue sources include revenues from

environmental fees on the sale of new tires, surcharges on each quart of motor oil sold, and state general fund. Moving forward, the plan proposes increasing tipping fee surcharges and other new state-level revenue sources to fund the SMM program. New revenue sources explored include extended producer responsibility laws, recycling fees, and new environmental funds.

1.2.6 Iowa

1.2.6.1 Planning

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 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.*

The waste management hierarchy is referenced throughout the Iowa Code as a guide for state-wide decision making, setting priorities, developing solid waste comprehensive plans, and awarding financial assistance. It was established not only to protect the public health but conserve natural resources and save energy. It continues to provide value as a guide for managing discarded waste. The "*Reduce, Reuse, Recycle*" component of the waste management hierarchy has also been beneficial in providing public awareness and education to foster behaviors that reduce reliance on sanitary landfills for management of end-of-life materials.

1.2.6.2 Measurement

Per the 1989 Waste Volume Reduction and Recycling Act, Iowa established the statewide goal to reduce the amount of materials in the waste stream, existing as of July 1, 1988, by an intermediate goal of twenty-five percent, and by a final goal of at least fifty percent, through the practice of waste volume reduction at the source and recycling.

Iowa law requires cities and counties to develop a comprehensive solid waste reduction program in collaboration with the landfill(s) or other waste facility(s) that serves their area. These programs/strategies are detailed in a plan, which is referred to as a comprehensive plan. Cities and counties can develop plans individually, or they can group together with other cities and counties (often grouping together in political subdivisions called 28E organizations) to prepare a solid waste comprehensive plan. A city or county or group of cities and counties preparing a plan is referred to as a planning area. Iowa's Administrative Code defines a comprehensive plan as: "a course of action developed and established cooperatively between cities, counties, and sanitary disposal projects regarding their chosen integrated solid waste management system, its participation, waste reduction strategies, and disposal methods."

Every five years each planning area completes a plan update. With input from stakeholders, planning areas evaluate current waste management practices and measure their progress towards achieving the waste reduction goals. Iowa DNR reviews and approves the updates to ensure that the plan meets code requirements. Planning areas are required to have an approved solid waste comprehensive plan on file in order to renew solid waste facility permits that serve their area.

1.2.6.3 Programs

The state of Iowa encourages the development of waste volume reduction programs and education at the local government level through incentives, technical assistance, grants, zero and low interest loans and other supporting programs. Iowa's citizens, local governments, business and industry have proactively worked together to protect Iowa's environment by reducing waste, recycling, manufacturing recycled goods and buying recycled-content products. Moreover, it is Iowa policy to support and encourage the development of new uses and markets for recyclable materials. This cooperative effort has built an impressive recycling industry that creates and retains higher wage jobs and businesses.

Iowa's Beverage Containers Control Law, also known as the "Bottle Bill," was enacted in 1979 to reduce litter through redemption of beverage containers and has fostered increased recycling of the targeted beverage containers. Iowa's container deposit law covers all carbonated and alcoholic beverages. Consumers pay a five-cent deposit when purchasing a beverage container and receive a five-cent refund when returning the container to a store or redemption center. The high level of participation by Iowa's businesses and Iowa consumers has resulted in a successful program. An estimated 71% of beverage containers are redeemed annually in Iowa.

In 2015, the Iowa Waste Reduction Center (IWRC) at the University of Northern Iowa contracted with the Iowa DNR to investigate food waste generation in the industrial, commercial, and institutional (ICI) sectors throughout the state of Iowa. Created under the 1987 Iowa Ground Water Protection Act, the

IWRC's mission is to assist Iowa small businesses with environmental regulations compliance and to reduce the amount of solid waste being directed to Iowa landfills.

The IWRC completed a study identifying food waste generators, documented generation characteristics, and estimated food waste generation rates on a statewide basis. The data collected and utilized in this initiative provides the Iowa DNR with information to foster the creation of food waste recovery programs and facilitate development of food waste management infrastructure to divert food waste from disposal.

A comprehensive set of Regional Household Hazardous Waste Collection Centers (RCCs) have been established throughout the state of Iowa. RCCs are permanent collection facilities designed to properly manage and dispose of hazardous waste from households and conditionally exempt small quantity generator (CESQG) businesses. RCCs accept specific types of hazardous materials that are toxic, flammable, corrosive and reactive. Many RCCs provide a material exchange for usable products. Iowa DNR Grants have been provided to establish RCCs or improve/expand existing RCC facilities and services.

1.2.6.4 Funding

Iowa Code section 455B.310 establishes a statewide solid waste tonnage fee. Tonnage fees are fees collected and remitted to the State by the operators of Iowa's sanitary landfills for each ton of solid waste received and disposed of at an Iowa landfill. Currently, the base tonnage fee is $4.25 per ton of solid waste. This amount is reduced or increased dependent upon the level of waste reduction that is achieved by the cities and counties using each landfill. In 2018, the average fee collected per ton of waste disposed in landfills was $3.63. The local solid waste agencies responsible for solid waste management retained an average of $1.50 of the tonnage fee collected. The retained monies are used for waste reduction, recycling, or small business pollution prevention purposes. The remaining moneys are remitted to the Iowa DNR and deposited into the Groundwater Protection Fund. The monies in the Groundwater Protection Fund are apportioned to various state programs based on Iowa Code section 455E.11.

The Solid Waste Alternatives Program (SWAP) was established to reduce the amount of solid waste generated and landfilled in Iowa. Through a competitive process, financial assistance is available for a variety of projects, including source reduction, recycling and education. The program provides financial assistance in the form of forgivable and low interest loans.

Any unit of local government, public or private group or individual is eligible to apply for program funds and can be used to fund a broad set of activities associated with fostering waste reduction and recycling.

Projects are selected through a competitive process. Emphasis for selected projects is placed on tonnage avoided or reduced, sustainability and ability to replicate the program or project.

Local governments are the principal responsible entities for implementing waste reduction and diversion programs. The landfill tipping fees are the primary revenue source for funding local programs with a few other supplemental funding sources.

1.3 Findings and Conclusions

Upon review of the information gathered during research of state SMM policies and programs, we were able to draw the following conclusions:

- ***While the principles of SMM encourage a wholistic approach to goal setting, statewide SMM goals are still tied to diversion and waste reduction.*** State's like Minnesota and Oregon have identified the need to transition to goals that reflect these principles and measure specific environmental impacts. For example, Minnesota expresses the desire to transition to a material capture rate goal to more efficiently measure and improve upon material recycling rates – however, has yet to implement specific material capture rate guidance, goals, or standards. The state of Oregon has set greenhouse gas emissions goals but has not effectively tied those goals to their SMM statewide goal. Both states are, however, transitioning to these metrics and goals and preforming a number of studies to quantify impact using LCA and annual reporting.
- ***The funding mechanisms are not necessarily sustainable in the long-term***. Tipping fee surcharges still common revenue sources, however, are not sustainable given increased the diversion intended from SMM policies. Many states have identified this as a problem and have actively explored alternative methods of funding SMM programs.
- ***States transitioning to a SMM system prioritize organics diversion and product stewardship.*** Organic wastes, specifically food wastes, make up a large percentage of the municipal solid waste stream. By prioritizing organic waste reduction, diversion, and energy reclamation, states can cost-effectively work to achieve SMM goals. Product stewardship strategies place responsibility for end-of-life management in the hands of producers, generates revenue for material diversion, and can create SMM corporate citizenship.

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