Recycling in Alabama

Cleaner

Greener

Alabama

Increasing the Recycling Rate

Celebrating Alabama's Progress

Certified Public Manager Program

CPM Solutions Alabama 2023

CPM
CERTIFIED PUBLIC MANAGER PROGRAM
AUBURN UNIVERSITY AT MONTGOMERY

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The research, findings, and recommendations presented in the white paper do not represent the views of any agency or organization, but rather the collective educational research and analysis from a diverse group of team participants in the Certified Public Manager® Training Program.

Introduction

Solutions Alabama is the capstone project of the Certified Public Manager program administered by Auburn University at Montgomery. Our team projects are designed to highlight critical issues facing the citizens of Alabama. Each team researches an assigned issue, highlights what Alabama is currently doing, and proposes research-based recommendations to further solve the problem. Our team's topic is how to increase the recycling rate in Alabama. Through this project, we will determine how to encourage more people to recycle and how that will benefit our state. To answer these questions, we researched the history of recycling, the benefits of recycling, and how Alabama and other states and local governments are encouraging their citizens to recycle. Based on our research, our recommendations are being made within this project white paper.

It is our team's purpose with this project to help move Alabama further in the direction of sustainability. Simply put, "sustainability consists of fulfilling the needs of current generations without compromising the needs of future generations, while ensuring a balance between economic growth, environmental care and social well-being." (Santander, 2022). We believe recycling will not only benefit our citizens from a conservation standpoint but also from an economic one. This paper and presentation will highlight what we have learned and serve as a catalyst for renewed energy and focus on the issue of recycling in Alabama.

Background and History

Since the 1960's, increasing environmental consciousness in the United States has led to passing laws and creating government agencies aimed at protecting the earth's natural resources. Through media and education programs, generations have grown up with Earth Day, Keep America Beautiful, and "Reduce, Reuse, Recycle." Today, government and business increasingly work together to promote sustainability through green policy in the public and private sectors.

Protecting Alabama's environment is the job of the Alabama Department of Environmental Management (ADEM). The mission at ADEM is "to assure for all citizens of the State a safe, healthful, and productive environment." (ADEM, 2023). This is accomplished through programs that administer and enforce state environmental laws.

In 2008, the Alabama Legislature formally addressed the issue of recycling in Alabama in an amendment to §22-27, Code of Alabama, 1975, known as the Solid Wastes and Recyclable Materials Management Act (SWRMMA). It contained several provisions related to solid waste disposal including control of unauthorized dumping, establishing a trust fund to pay the cost of investigation, required cleanup, and closure of unauthorized dumps, and authorization of fees for disposal of solid waste within the state. The benefit to recycling in Alabama in this new law came through the establishment of a trust fund to provide for a grant program for local governments to develop, implement, and enhance recycling and waste minimization efforts and to establish minimum standards for solid waste reduction, minimization, and recycling.

§22-27-15, Code of Alabama, 1975, required ADEM to establish a goal for the percentage of reduction in the amount of household and commercial solid waste and the time frames for that reduction. The reduction of solid waste would come not only from recycling, but also from diversion of materials from landfills by other means including source reduction, waste minimization, reuse, composting and incinerating.

The goal for solid waste reduction set by ADEM was 25 percent. In 2015, the overall waste reduction rate in Alabama was reported as 16.36 percent. At that time, only 25 percent of Alabamians had access to curbside recycling. By focusing on increasing the recycling rate statewide, the 25 percent goal of diversion is very feasible.

SWRMMA established for the levy of disposal tipping fees of $1 per ton or $0.25 per cubic yard for dumping waste at solid waste management facilities permitted by ADEM. These fees supply the funding for ADEM's recycling grant program. Alabama Recycling Fund (ARF) grants are available to communities across Alabama to develop and strengthen their recycling efforts.

Following SWRMMA becoming effective, a group of public and private entities was established into the Alabama Recycling Partnership (ARP). In 2015, ARP commissioned a study by the Southeastern Recycling Development Council (SERDC), a non-profit organization whose mission is, "to promote recycling and its economic benefits in the Southeast by strengthening relationships across the recycling value chain." (SERDC, 2023) The study had several goals, including the

identification of best practices for recycling and the economic impact of the recycling industry in Alabama.

In 2016, SERDC produced a report that outlined eight best practices for the state to increase recycling and improve its current system. The report listed recycled raw materials recovered within the state as a viable engine for Alabama's economy. The report also showed that by tapping into the available materials, a significant economic impact can be made.

The best practices recommended in the report are summarized here:

1. Optimize the collection, transportation, processing, and marketing of recyclables along a system of recycling facility "hubs" and "spokes". Material recycling facilities (MRFs) collect and process recyclables. A small number of these "hubs" can process materials from a number of surrounding communities through transfer "spokes," making recycling more efficient.
2. Encourage and incentivize local communities to provide cart-based single stream recycling as well as to promote drop-off recycling centers for glass containers. Citizens use a recycling container, or cart, located at their home or business to collect all recyclable materials, without having to sort them by type. This single stream of recyclable material is then sorted at a MRF.
3. Encourage and incentivize curbside communities to provide drop-off recycling access for multi-family populations, and rural communities for their entire populations.
4. Encourage and incentivize local governments to adopt a common suite of materials in their recycling program. The State should also develop a toolkit of consistent material descriptions and terms for these materials.
5. Develop a standardized recycling education and outreach program that establishes a theme and a "brand" for recycling in Alabama to provide to communities for their use and adoption.
6. Improve the statewide data reporting system and ensure that it covers all entities that manage materials, including collectors and markets.

7. Adopt programmatic strategies for the regional hub and spoke recycling system, including strategic planning to collect materials, limit disposal of non-recyclable materials, and offer economic incentives to reduce waste.

8. Restructure the recycling grant program to support all the facets of the report's recommended new recycling system by strategically awarding grants to create a statewide recycling system. (SERDC, 2023)

Several of these best practice recommendations have already been put into practice, at least in part. Most notably, the legislated tipping fee imposed on all solid waste disposal in the state allowed ADEM to create ARF grants, which provide funding to communities for creating or improving their recycling programs. ADEM has been working to promote ARF statewide to inform local governments of the available funds. From 2009-2019, according to ADEM's website, an average of $1.7 million was available annually through ARF. As more grants are funded and news of the program spreads, more grant applications are being received by ADEM each year.

ADEM is joined in its effort to promote recycling by a growing number of green industries that use recycled materials in their production processes. The Alabama Recycling Partnership, which commissioned the SERDC report, counts among its members several companies that will benefit from an increase in the recycling rate in Alabama. As the report concluded, not only do recycled materials have value as raw materials, but the result of increased recycling can create jobs, business income, other increased economic activity, and state and local tax revenue. The total potential economic impact of recycling in Alabama, according to SERDC, is in excess of 84,000 jobs and $24 billion.

TABLE 5
ECONOMIC BENEFIT OF RECYCLING IN ALABAMA

Economic Benefit	Value to State of Alabama
Jobs	84,412
Business Income	$4.5 Billion
Increased Economic Activity	$19.4 Billion
State and Local Tax Revenue	$765 Million

(SERDC, 2023)

Not only is ADEM interested in increasing the recycling rate, but the Environmental Protection Agency (EPA) in 2020 released its goal for recycling in America. By 2030, this agency aims to see the recycling rate in America reach 50 percent of solid waste produced. This ambitious project is backed by an infrastructure of educational and monetary resources available to states, tribes, local governments, and other entities to promote recycling. The EPA recognizes the benefits to the ecology as well as the economy of the United States and its citizens.

Benefits of Recycling

According to the Environmental Protection Agency, "recycling is collecting and processing materials that are considered trash and converting them into new products." (EPA, 2023). Recycling sustains the environment and reduces waste sent to landfills which lessens the harmful effects of pollution. Recycling saves money, energy, protects the environment, and preserves natural resources. For example, recycling just ten plastic bottles produces enough energy to power a laptop for more than 25 hours (EPA, 2023).

Even with public awareness and increased curbside collection bins, recycling in the United States can be improved. Curbside collection is only one step in the recycling process.

Recycling is not just a matter of recovering recyclable materials; it is a total economic system. The markets for the material consumers put on the curb or into the recycle bin will be depressed until recycled consumer products become more available.

Companies like American Airlines and Coca-Cola have made buying recycled products and investing in green R&D part of their overall business strategy. They have cut down on waste, increased profit margins, and in some cases, created new business models that include the use of recycled materials in their manufacturing.

The success of recycling depends on whether or not recycling makes economic sense. To build demand for recycled materials, government and business must not only seek ways to collect and use recycled products, but they must also create recycling relationships.

The most common barrier to large scale recycling is supply of and demand for recycled materials. Media stories abound concerning recycling centers and waste haulers dumping loads of plastic

bottles, newspapers, or phone books into landfills after preparing them for markets that do not exist.

The cost of recovered materials is one facet of the economic impact of the recycling industry. The use of recovered materials in the manufacturing supply chain is another. Using recycled materials in manufacturing creates jobs and contributes tax dollars in the local and state economy. By recycling, we create a healthier planet for ourselves and future generations. We also create a sustainable economic engine that reduces the need to extract resources such as timber, water, and minerals for new products.

Recycling is not just an issue in America, but a world-wide concern. According to Friends of the Earth, a grassroots environmental advocacy group in the United Kingdom, the government there has a target to recycle 65 percent of municipal waste by 2035. Currently, their recycling rate is approximately 45 percent. The group gives seven reasons why recycling is important:

1. Conserving natural resources
2. Protecting ecosystems and wildlife
3. Reducing demand for raw materials
4. Saving energy
5. Cutting climate-changing carbon emission
6. Cheaper than waste collection and disposal
7. Tackles youth unemployment

(Friends of the Earth, 2023)

Manufacturers being proactive in the selection of materials they use in packaging helps minimize waste and promote recycling. Consumers can play a part in that decision by patronizing companies that use environmentally friendly packaging. Pollution produced by landfills and the devastating effects of plastic in our oceans are just two reasons that recycling is important. By increasing

recycling at home, in schools, and in our workplaces, we can reduce the effects of pollution related to solid waste disposal.

Another important reason for recycling is reducing litter. Less litter on our highways and byways makes Alabama a more beautiful place to live and work. Keep Alabama Beautiful believes that being litter-free is the most important part of a first impression when people visit your area. The Beautification and Community Greening Program for Alabama was put into place in order to assure that people get a good first impression when they come to visit as well as make the state beautiful for its residents.

Keep Alabama Beautiful programs help to prevent litter through Adopt-a-Mile, Adopt-a-Park, Adopt-a-Stream, CleanYOURBlock, Prevent Litter, Cigarette Litter Prevention, Trash Dash, and Great American Cleanup. These programs are put in place to help keep Alabama beautiful as well as invest in future generations of Alabama citizens. In addition to these programs there are recycling centers and other beautification projects that take place all over the state of Alabama. (Keep Alabama Beautiful, 2023)

A vast network of recycling resources exists to aid any state, local government, or grass-roots effort to increase recycling. A simple Google search will bring up thousands of hits on recycling resources. From federal agencies like the EPA, to non-profit agencies like Keep America Beautiful, and private businesses such as Waste Management, there is a plethora of information about recycling and the benefits of participation. According to the Keep America Beautiful website, consumers, businesses, and municipalities want more recycling and goods made from recycled materials. The benefits are clear, the resources are available, and we stand at a tipping point in our history. The effect of inaction today on the future of our environment and people is potentially devasting.

Celebrating Alabama's Recycling Success

So, where does our state stand in this global battle? Alabama has not been stagnant in the fight for solid waste reduction.

State Government

In 2008, as required by SWRMMA, ADEM to set forth a statewide solid waste reduction goal of 25 percent. Some of the goals of SWRMMA were to:

1. Establish a statewide waste reduction/recycling program, goal, and measurement methodology.
2. Provide stable funding for ADEM's solid waste and recycling programs.
3. Establish a grant program for local recycling efforts.
4. Provide fiscal resources to remediate unauthorized dumps/illegal disposal sites. (ADEM Administrative Code, §335-13-13)

All programs require funding. Alabama collects tipping fees of one dollar per ton of solid waste disposed in landfills. The Alabama Recycling Grant program receives 25 percent of the fees, and the other 75 percent are used in the administration of SWRMMA.

ADEM's website provides information to non-profit and local government entities and schools seeking recycling grants. Applications for these grants are due on March 1 each year. (ADEM Administrative Code, §335-13-10) Since the inception of SWRMMA, grant applications have increased each year as information about their availability spreads. These grants provide needed funding for recycling activities statewide.

Alabama Schools

Educating the public about recycling has been ongoing for many years, but does educating the public work to get more citizens to recycle? Teaching future generations can make recycling a "norm" as they grow. Recycling can then become a habit that is carried into adulthood. By recycling, citizens reduce the amount of solid waste that is transferred to landfills. So how do we, as a state get more counties, cities and individuals involved in recycling? How do we educate adults and parents about recycling?

In the course of our research, our team met with the Alabama Department of Education (ASDE). Dr. Michal Robinson described recycling programs that some Alabama schools have implemented.

Currently, recycling education in the schools that were highlighted focuses on students in kindergarten, special education programs, 5th through 8th grade, and high school. When working with the younger children, middle school and below, the focus is to teach them what recycling is, why it's important, who should be recycling and how it is done. The goal on this level is for children to take this information back home to their families to get them involved in the process and practice of recycling.

The next level of education is focused on the high school level. The emphasis here is on the conservation aspect of recycling. It is the hope that, from this multi-level education, the enthusiasm for recycling will continue into their adulthood. This approach is also taken in the Gulf Shores City School system, where there is an after-school recycling program to continually educate students about recycling from elementary to high school. There are recycling bins in the classrooms, in the hallway, and in front of the school to promote and encourage everyone to participate.

The US Department of Education's Green Ribbon School program highlights schools and school systems in the US that model sustainability. The program focuses on sustainability through cost-saving, health promoting, and performance-enhancing school initiatives related to the responsible handling of waste. Several Alabama schools have been successful in achieving Green Ribbon School status. These schools promote sustainability by educating students, teachers, and staff about responsible waste management practices.

In the Gulf Shores city school system, environmental sustainability is incorporated into the academic program. Recycling and diversion of solid waste are taught to students at a young age. Children learn about the importance of recycling, not only to the global environment but also the positive effect it has in each city and county. Young people then take what they learn home to educate their families and garner further interest in sustainability.

Another Alabama success story is the Talladega County school system. There the focus is on involving school-aged children to teach the community about recycling. Students take their new-found knowledge and practices learned at school to share with their families at home. This program has been so successful, the Talladega County school system was also awarded the Green Ribbon

School Award. When the idea of sustainability leaves the classroom and enters the community at large – change happens.

Local Programs

The City of Auburn is a great example of a recycling community. The Eastern Alabama Recycling Partnership (EARP) consists of Lee County, the City of Opelika, City of Auburn, and Auburn University. The vision of EARP is to establish a comprehensive and coordinated regional recycling program that will divert a combined 50 percent of municipal solid waste from landfills. EARP has a long-term goal of promoting the development of a regional materials recovery facility. Goals like this help to bring companies to Alabama with the ability to repurpose waste. (East Alabama Recycles, 2023)

Auburn is a great example for other cities of similar size and demographics. Auburn started its recycling program in 1987 with a simple questionnaire mailed to its citizens. The survey asked each household if it would be interested in participating in a curbside recycling program. Those who wanted to participate were provided with curbside containers. As time progressed, more residents joined the program, many following the lead of their neighbors. In 1999, a drop-off recycling center that is accessible 24/7 was opened. To date, the program is so successful that a larger drop off center is planned. Since the program started, Auburn's recycling rate has continued to grow to an outstanding 84.7 percent participation. Education about recycling continues in Auburn through information on the city's social media pages and website that even includes interactive games about recycling.

Business Initiatives

For recycling to become more than a benefit to our ecology, businesses must get involved. Even if every resident of Alabama recycles their household waste, without a market to purchase the recycled materials, we are still left with material that serves no purpose. Recycled commodities have value and can help defray the cost of recycling services. Fortunately, Alabama already boasts several manufacturers that use recycled materials in their products. KW Plastics in Troy is the largest recycler of plastic in the world. They produce high quality plastic resins that are used worldwide. Encore in Rainsville reconditions OEM bumper covers for automotive bodies. They

take what is essentially junk, repair and reuse it. These are just two companies in Alabama that specialize in the repurposing of waste. Every product manufactured in their facilities diverts solid waste from Alabama landfills.

Ecore in Ozark and Novelis in Bay Minette are two more companies entering the state that use recycled materials in their manufacturing. Ecore is investing $25.5 million to build a facility that will recycle rubber tires to create flooring and surfacing products. Novelis will spend $2.5 billion in Baldwin County to recycle aluminum for the beverage container industry. They are also partnering with the local government there to build a material recycling facility. Information provided by the company shows the flow of materials involved in their business model. This model is integrative, with consumers and producers each contributing to close the loop.

(Novelis, 2023)

As more companies choose to find their raw materials in the recycled material markets, the demand for these materials will increase, making recycling more cost-effective for communities. This is the circular economy that makes recycling not only affordable, but potentially profitable.

Recycling in America

Alabama is not alone in its aspirations to increase recycling. Our research uncovered other states' programs to encourage their citizens to recycle. The states of North Carolina, Vermont, California, Connecticut, New York, and Massachusetts were our research subjects for their successful programs to reduce waste and promote recycling. These states employ various methods to promote recycling including education, legislation, and incentives.

North Carolina

North Carolina has a recycling rate of 44 percent. It provides common recycling guidelines and educational materials for each community to help educate its citizens. In 1989, and the years following, the North Carolina General Assembly passed legislation that prohibits certain materials from being disposed of in landfills (Recycle More NC, 2023). North Carolina subsequently passed statutes creating programs to collect and recycle aluminum, newspaper, office paper, glass, and plastic bottles. Additionally, fluorescent bulbs used in public buildings are required to be recycled and public agencies must purchase recycled paper and paper products and other products with recycled content. (North Carolina Environmental Quality, 2023). In North Carolina, education helps reduce recycling contamination. The North Carolina Department of Environmental Quality conducts numerous studies related to recycling in the state. One study showed the contamination can drop significantly with an eight-week curbside outreach campaign. North Carolina makes educating the public, single-stream collection, and enforcement the emphasis of their recycling program. Simply switching to single-stream recycling, removing the need for residents to sort materials for recycling, has increased participation and tonnage of materials being processed.

North Carolina is home to more than 670 recycling companies with an annual payroll of $664 million and has more than 60 manufacturers that rely on recycled material to make essential products. These companies employ over 14,000 workers with annual sales of more than $4 billion. There are 2.17 million households served by 312 curbside programs, according to the state website, (Recycle More NC, 2023).

North Carolina also offers grants, available to each community to help fund recycling programs. The various grants include:

- The Community Waste Reduction and Recycling Grant Program - a recurring program for local governments to expand capacity to divert materials from the waste stream and/or increase public awareness of recycling.
- The Multifamily Recycling Grant Program provides the opportunity for communities to initiate or expand multifamily recycling programs within the state.
- The Glass Equipment and Infrastructure Grant is designed for single-stream material recovery facilities (MRFs) to purchase glass recycling equipment or for local governments to establish or expand community drop-off glass collection. (North Carolina Environmental Quality, 2023).

Vermont

Vermont has a recycling rate of 62 percent. It is estimated that Vermont recycles 72 percent of its paper and containers. Vermont has implemented many actions to increase its rate of recycling. The state provides grants in support of recycling, composting, and waste reduction. Some of the grants provided are school compost/recycling grants, home compost bin grants, and Solid Waste Management Entity outreach grants. (State of Vermont, 2023)

In 2012, the Vermont Legislature passed the Universal Recycling Law (Act 148), which bans three categories of materials from going to landfills: the disposal of common recyclables (2015); leaves, yard debris, and clean wood (2016); and food scraps (in phases with a full ban in 2020). The phases of the food scrap ban began with banning food scrap disposal by commercial food producers, then rerouting potential food waste from restaurants and stores, and the final step of the total ban of food waste in all trash and landfills. Banned recyclables include paper (mail, magazines, newspaper, office paper, paper bags, and box board); cardboard; aluminum and steel cans, foil, and pie tins; glass bottles and jars from food; and hard plastic bottles and jugs #1 and #2. The Universal Recycling law prioritizes food waste reduction, food donation, feeding animals, composting, and anaerobic digestion as the highest uses for food. (State of Vermont, 2023)

Vermont offers incentives to reduce waste by requiring municipalities to implement variable rate pricing for materials collected from residential customers based on volume or weight. This

incentive is known as Pay-As-You-Throw. With the Universal Recycling law, all Vermont towns require waste collectors to charge for trash based on its volume or weight instead of a flat fee, thus allowing the people of Vermont to pay less if they produce less trash. Haulers are also required to utilize variable rate pricing systems in accordance with the specific ordinances and rules that are implemented by municipal entities, including solid waste districts, towns, town groups, and alliances. More recycling options are available by requiring recycling containers to be in public buildings and publicly owned or controlled municipal and state land wherever trash cans are located, except in bathrooms. (State of Vermont, 2023)

California

California's recycling rate is 54 percent. The California legislature passed the Integrated Waste Management Act of 1989 which required all cities, counties, and approved regional solid waste management agencies to enact plans and implement programs to divert 25 percent of their solid waste by 1995 and 50 percent by the year 2000. Later legislation mandated that 50 percent diversion be achieved every year. CalRecycle ensures all California cities, counties, and approved regional solid waste management agencies plan and implement programs to divert 50 percent of their solid waste annually. Compliance and enforcement include reviewing annual reports and conducting site visits. Students are a focal point of educating the public, as they learn waste reduction at schools and can take the information home to their families. (CalRecycle, 2023)

In San Francisco, the Board of Supervisors and Mayor established the goal of sending zero waste to landfills by 2020. All citizens are required to separate their waste per legislation passed by the city. In the past decade, San Francisco reduced their contribution to landfills by half. The city diverts 80 percent of all materials that would otherwise go to a landfill through source reduction, reuse, recycling, and composting. Two new Zero Waste goals set by the city of San Francisco will reduce landfill use by 50 percent and solid waste generation by 15 percent by 2030 (San Francisco Environment Department, 2023).

Owners and managers of homes, apartments, condos, food establishments, and events are required to provide color-coded, labeled bins in convenient locations. Recyclables (blue bin) are for materials that can be made into new bottles, cans, and other products. Compostables (green bin)

are food, soiled paper, and plants that are composted into nutrient-rich soil used by local farms. Trash (black bin) is taken to landfills. Educational material on recycling must be provided to tenants, employees, contractors, and janitors on what goes in each bin. Property owners can lower their bills by recycling and composting more and ordering a smaller black trash bin or decreasing their collection frequency. The waste management provider gives apartment starter kits and pails for kitchen food scrap collection. (San Francisco Environment Department, 2023).

Connecticut

Connecticut's recycling rate is between 24 and 30 percent (Northeastern Recycling Council, 2023). Until 1975, most towns in Connecticut directed their trash to landfills in their own communities. Because of these landfills failing to meet federal guidelines, reaching their capacity, and/or posing health risks to the water supply, leaders began to formulate a plan to develop new methods for disposing of solid waste. The plan is multifaceted and tackles waste by reducing the origins of waste, turning waste into fuel, and recycling. Landfills are used as a last resort for processing municipal trash. (State of Connecticut, 2023).

In 1980, laws were passed making recycling mandatory in Connecticut. These regulations required 25 percent of municipal waste be recycled by January 1, 1991. According to the state's website, the items the laws initially targeted included, "glass food & beverage containers, used motor oil, vehicle batteries, scrap metal, corrugated cardboard, newspaper, metal food & beverage containers, leaves, white office paper" which aided them in meeting their goal. Five years later, the laws were amended to include mandatory recycling of nickel-cadmium batteries. Manufacturers sponsor programs for batteries to be returned directly to them by partnering with designated establishments within the community. (State of Connecticut, 2023)

Grass clippings in Connecticut are banned from landfills. Homeowners are encouraged to allow their grass clippings to remain on their lawns and/or be composted. The grass that is not recycled through these channels is burned to create energy which is sold to utility companies. By 2003, only 4 percent of cut grass went to landfills.

In 1993, new laws were passed in Connecticut that increased the recycling goal to 40 percent. As goals were increased, some municipalities added even more items to the list of mandatory items to be recycled. These items include magazines, certain plastic items, as well as some mail.

Leaders in Connecticut encourage municipalities to connect with a collection facility that allows them to benefit economically from the sale of their recyclables. Companies benefit by buying from the local facilities since there is a steady supply of recycled materials available. The state also takes an active role in purchasing and promoting the use of recycled materials. Today, Connecticut is a model for recycling in the United States.

New York

According to the New York State Department of Environmental Conservation, each person produces 4.5 pounds of waste daily. The US Census report from 2021 puts New York state's population at about 19.84 million people. Based on these figures, New York produces over 89,000,000 pounds of waste daily! There are about 30 landfills in the State of New York that take in around 6 million tons of trash from within the state. The state also diverts about 2.5 million tons to facilities that turn waste into energy. In 2008 alone, more than 6 million tons of waste was exported to other states.

In 1988, the New York State Assembly passed the State Solid Waste Management Act (New York State Assembly, 2023) to reduce unnecessary waste entering the landfill. This mandates the separation of all recyclable items from garbage and requires each city in the state of New York to have a 40 percent recycling rate. The act also requires packaging manufacturers to design the materials they sell to have the ability to be reduced, reused, and recycled. There are numerous policies and resources that contribute to increasing the recycling rate of New York, such as the foam ban which prohibits the use of Styrofoam containers and packing peanuts, the bag waste reduction law that requires retailers to recycle plastic bags, New York's bottle bill which requires a refundable deposit on beverage containers, and the organic materials management program, which provides guidance of the disposal of food waste (New York State, 2023).

Residents, schools, institutions, and agencies must set out clear bags or labeled bins with "Department of Sanitation" clearly marking them as meant for recycling. Items that must be

recycled are cardboard, glass, paper, rigid plastic, and metal cartons. If recyclables are not separated properly from trash or bins/bags are not clearly labeled, a ticket may be issued (City of New York, 2023).

Massachusetts

In Massachusetts, 37 percent of the waste produced in the state is recycled. According to Mass.gov, Massachusetts General Laws Chapter 16, Section 21, mandates that the Massachusetts Department of Environmental Protection create and maintain an extensive plan for handling and reducing solid waste which is updated every decade. The initial Solid Waste Master Plan (SWMP) was published in 1990 with a goal of reducing source waste and establishing recycling goals to be met by the year 2000. Their goals include reducing trash by decreasing the sources of waste, recycling, and clearing toxins from waste prior to disposal, as well as initiating a program within the University of Massachusetts to work with industries on the stewardship of their goods.

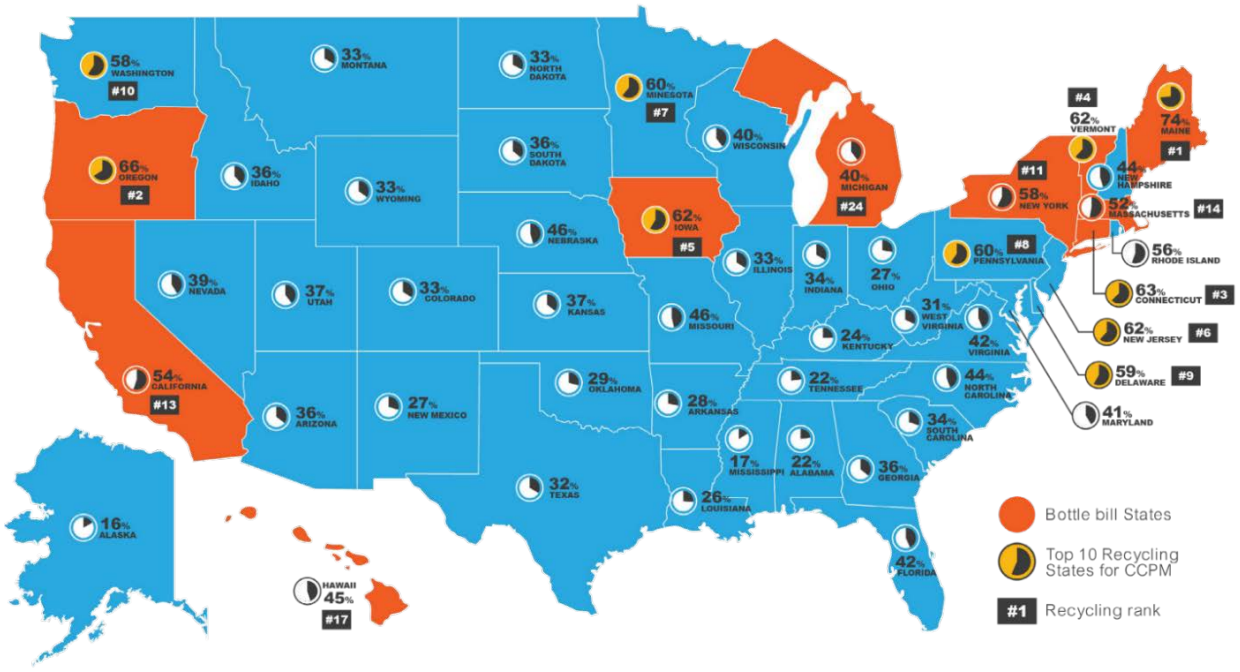
In the revision of the SWMP in June of 2006, the state recognized the accomplishments of the initial plan. These accomplishments included a 60 percent total reduction of waste in 2004. The number of municipalities participating in the Pay-As-You-Throw program also increased from 94 to 114. Additionally, there was a 30 percent increase in the number of citizens participating in this program. (Massachusetts Department of Environmental Protection, 2023)

A Supermarket Organics Recycling Network now exists to divert most grocery food waste. Between 60 and 75 percent of trash is diverted away from landfills. The program generates savings of approximately $45,000 per store. Through the network, loans are available to companies that provide services directly related to recycling. Companies operating in this industry can apply for loans ranging from $50,000-$500,000 to purchase equipment, real estate, and financing for acquisitions. Local cities, towns, and regional authorities can also apply for grants to assist in their programs to increase recycling in their communities.

The programs of the several states highlighted in our research show how a multi-layered approach to recycling, including legislation, can affect the recycling rate.

Currently, ten states and all Canadian provinces have laws requiring a refundable deposit on beverage containers. So called “bottle bills,” the laws in these states contribute to a reduction in litter and the amount of waste going into landfills. In 2020, a study was conducted by Eunomia for the Ball Corporation that investigated recycling rates for common containers and packaging materials (CCPM) in the United States.

Their report was a comprehensive look at recycling in all 50 states in the US. The map below shows how the states rank in their rates of recycling:



(Eunomia, 2021)

All of our research points to how important recycling is to our nation’s economy and social consciousness. Citizens around the country spearhead grass roots efforts that can eventually lead to legislation and policy regarding recycling and the diversion of materials from landfills. The question for Alabama is, “What can we take from these examples to increase the recycling rate in our state?” Our research into the successful programs of other states and the SERDC report of best practices leads us to specific recommendations.

Recommendations

Leadership

The catalyst for increasing the recycling rate in Alabama is communication and cooperation among the stakeholders to create a unified purpose and goals. All the recommendations outlined in this project need to be strategically planned. As the state agency in charge of environmental management, ADEM is the logical leader in these initiatives. Our team recommends that ADEM use its resources to strengthen the network of local government contacts by inviting them to help develop a step-by-step strategic plan to increase the rate of recycling. We propose ADEM work with a professional public relations firm to create a statewide public service campaign. Our team further advocates the Alabama Department of Education (ASDE) be part of this campaign by mandating a recycling curriculum be taught to students and practiced in schools statewide.

We also recommend individuals be identified from all sixty-seven counties to work with ADEM to communicate, educate, and enforce existing waste management policies and implement new ones. We propose that funding for this plan be sought through the EPA's grant program and from businesses and environmental awareness organizations.

With ADEM's leadership and adequate funding, efforts to educate and incentivize Alabamians to recycle can be carried out on a variety of fronts in a strategic manner.

Education

Based on the team's research, we recommend a multi-level approach to educate children and adults about recycling. As is evident through other state programs, educating the citizens of Alabama is necessary to increase the recycling rate.

The start of this multi-level education initiative begins with the children. Making recycling a part of every school day makes the younger generation accountable and responsible for their participation in it. This promotes students' continued involvement and commitment to recycling. Consolidating the various resources and offering specialized training to teachers in schools through ASDE is needed to spread the message of recycling far and wide.

There are many agencies and resources available to teachers and school systems to enhance recycling education. An initiative by the Southeastern Environmental Education Alliance (SEEA) called “Don’t Waste It” is an example. “Don’t Waste It” is specifically an educators’ guide and program that includes information on waste management, recycling, composting, and waste reduction (SEEA, 2023). It consists of eleven lessons covering five themes: municipal solid waste, recycling, plastics, composting, and landfills. The program is available in the southern states of Alabama, Florida, Kentucky, North Carolina, and Tennessee.

The Environmental Education Association of Alabama (EEAA) is in the SEEA network, and their mission is “to enhance the abilities of formal and informal education to connect people to the natural world in order to foster responsible stewardship.” The members of EEAA are “comprised of educators from around Alabama who share a passion for educating our citizenry, especially our young people, on the diverse natural resources our state enjoys.” (EEAA, 2023) Teachers in Alabama should be provided with and encouraged to utilize these resources.

Educating the community though events like Earth Day can be very successful. Earth Day is celebrated on April 22nd of each year. Its purpose is to celebrate the “birth of the modern environmental movement” and to “demonstrate support for environmental protection” (Earth Day, 2023). In 2022, ADEM held an Earth Day outreach program at the Montgomery Zoo, and again at the Mann Wildlife Learning Museum in 2023. The theme was “Invest in Our Planet” and the event’s purpose was to raise the “public awareness of actions both adults and children can take to help protect Alabama’s environment and Planet Earth” (WSFA, 2023). Programs like these can reach many people on a large scale and help garner public interest, educate citizens, promote participation, or restart the habit of recycling. These agencies and events are good stand-alone educational opportunities but there also needs to be a statewide education program. Although ASDE offers recycling resources highlighting how recycling affects the environment, these resources should be part of a formal curriculum taught statewide and put into practice in every school. We have to understand the impact that landfills have on the environment and how, as citizens, we can all reduce waste. Children are growing up in a global age, and we must teach them how our actions here affect people and places on the other side of the world.

By creating a comprehensive education program for children and adults the awareness of the need to recycle and participation in the practice will increase. Education can be in the form of mail outs, fliers, online education, social media outreach and more access to public recycling facilities. Drop-off recycling centers can make citizens aware that their community offers recycling and could potentially trigger the desire to recycle at home. Cities that don't have recycling programs could start in the same way as the City of Auburn, with a survey asking for those who would like to participate. Those who recycle can help educate others, who may think it is too complicated to recycle.

Legislation

Based on our research of states outlined in this paper, it is evident that legislation is an effective tool to increase the recycling rate. Our team recommends an incremental approach to enforcement of recycling and landfill bans, including grassroots legislation at the city and county levels. Statewide legislation to incentivize recycling is also recommended, including requiring a refundable deposit on glass containers. These "bottle bills" offer a monetary incentive for consumers to recycle glass beverage containers.

As education and public awareness increase, our team proposes that banning certain materials from landfills would support recycling efforts. If bans are effective for recycled plastics, for example, other material can be added in time. We realize this is a long-term strategy that cannot be immediately implemented. Getting legislation passed that restricts citizens' "freedoms" is difficult, even when it is for a good reason. However, we propose that this is a vital component in the strategic plan for increasing recycling in Alabama.

Along with government asking citizens to do their part, our team advises that existing recycling regulations be enforced in state buildings and that each building be equipped with water filling fountains and recycling bins. Requirements for recycling bins in state agencies currently exist per §22-22B, Code of Ala. 1975, but there is little to no enforcement. Our team advocates public service campaigns and communication within state agencies, which is vital to the success of any changes in law or regulation.

Incentives

In conjunction with laws governing recycling, we recommend incentives be implemented by local governments and private companies. Several states we researched offer incentives for recycling, such as Pay-As-You-Throw programs and limits on the number of bags disposed in a curbside garbage container. These incentives not only increase recycling but equate to money saved by citizens where they are in place. While these programs would have to be legislated within the state or community, they empower the consumer to make the choice of bearing the cost of waste disposal versus saving money by recycling. From the information our team examined, we recommend instituting Pay-As-You-Throw programs for garbage disposal and creating opportunities for citizens to fill reusable water bottles that will incentivize responsible waste management in Alabama.

The growing green economy creates markets for recycled materials. When recycling turns into cash, as with refunding deposits for returning glass bottles, people pay attention. Even without direct payments to consumers, when governments sell recycled materials collected in their jurisdictions, those funds can be used to decrease the cost of services or beautify their localities. Citizens are more likely to participate in programs where they can see the result of their actions. The team promotes the offering incentives to citizens as a vital component of the plan to increase the recycling rate in Alabama.

We further recommend that not only government, but private business encourage recycling through their business practices. Retailers, like the grocery chain Aldi, charge customers for bags. Stores that charge for disposable bags are far more likely to have customers bring their own. Even at Publix, where there is no charge for disposable bags but there are signs to remind customers to bring their own bags, consumers feel they are part of the solution to the problem of waste. This type of cooperation, where government and private industry work together to encourage recycling, incentivizes citizens to recycle and creates markets for recycled materials. As we saw from our study of other states' programs, everyone can benefit from doing the right thing.

Infrastructure

The best practices stated in the 2016 SERDC report proposed a hub and spoke system of recycling facilities throughout the state to optimize recycling efforts. Our team recommends the creation of this system be a primary focus in the strategy to increase the rate of recycling in Alabama. Montgomery County already has a material recycling facility (MRF) that serves counties in central Alabama by accepting recycled material. It also gleans recyclables from garbage that is disposed of with trash. This type of facility is known as a "dirty" MRF. Other communities have "clean" MRF's that accept single stream recyclables. A combination of clean and dirty MRF's are needed in Alabama to capture as much recyclable material as possible. Some communities, especially rural ones, lack the ability to effectively collect recyclables. By using dirty MRF's, recyclable material can be recovered even without community participation.

No one wants a landfill in their community. However, having a MRF in a community is a great opportunity to educate the public. Baldwin County's new planned MRF will have an educational space for students to learn about recycling onsite. Field trips for school children will be available to show them just how recycling works and how it can benefit them at home and globally.

Conclusion

We believe the recommendations generated in our Solutions Alabama project will help focus the trajectory of recycling in Alabama. Through the leadership of the Alabama Department of Environmental Management and the Alabama State Department of Education, recycling is already being highlighted. We believe by creating a strategic plan to include education, legislation, incentives, and infrastructure, the number of Alabama citizens participating in recycling and the recycling rate will increase. We would like to thank all of the stakeholders who give their time and talent to recycling in Alabama. We look forward to making an impact on the effort to increase recycling in Alabama through this report.

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