Guidance and Links for Teams
for the 2022 Massachusetts Envirothon Current Issue
1/12/22

Achieving a Zero Waste Future for Massachusetts

1. This goal of this document is to lay out the landscape of the Zero Waste issue to help teams launch their community research. It is an imperfect map to be used for explorations, not a textbook to be studied for a test. The goal is to get you exploring your community!
2. Much of the link-related text in this document is drawn directly from the linked websites. The intent is to give readers a better sense of each resource.
3. The document begins with a listing of the topics covered to give readers a sense right up front of what is included.
4. This document is a draft and may be updated and reformatted. Comments, and ideas for additional topics and resources should be sent to Will Snyder, Current Issue Station Leader:

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Outline of what is covered in this Guide

What is the "Current Issue"?

In this component of the Envirothon program, teams research a current environmental issue as it occurs in their own community, then prepare a presentation on their findings and proposed solutions.

YOU CHOOSE how far and deep you want to go. Envirothon provides guidance to judges, but there are no right or wrong answers or strategies. Follow your interests, dedicate the amount of time that feels right to you. Go where your energy is rising! Take charge of your learning, and pursue what YOU think is most important. The value of what you have learned will shine, the judges will take note, and YOU will have a great experience.

Environmental problems are too big and complicated to be solved by individual action alone. The Current Issue focuses on collective rather than individual action, particularly on how local and state government can solve problems. However, in 2022 we will look at action possibilities in both individual and collective arenas.

Preparing for your Current Issue presentation

Part of getting ready for the Envirothon is a community investigation. Your team will research a current environmental issue as it occurs in your own home community. You investigate the issue, then decide what next steps your community needs to take to address the issue. You will visit places and talk to people and identify the important steps that need to be taken.

Then you prepare a 15-minute presentation on what you found and your recommendations. You give that presentation to a panel of judges at the Envirothon, then answer their questions for 10 minutes.

Some teams catch fire in their Current Issue research. They can earn the Community Research award. Some teams take that deep, wide research and put it to work in a community project. They can earn the Community Action award. Some teams decide to take on a project that aims to change the system that caused the problems. Their project may gain recognition for Civic Engagement.

This "Guidance and Links for Teams" is designed to help launch your team into your community research

- The goal is to give you a sense of the breadth of this field, and to whet your appetite to explore.
- The goal is to launch you into investigations of real people and places in your community.
- The information and links here are NOT comprehensive.
- You do NOT have to explore all the areas included here.
- What looks interesting? Start there!

This presentation will be updated. As resource people review it, and as teams recommend resources they have discovered, it will become a more helpful resource. It will become a better map of this year's Current Issue.

But remember: Even when it's "finished" it is still just a map. YOU will choose your own areas to explore, and YOU will decide how deep you want to go.

What teams can gain from the Current Issue/Community Awards experience

The Current Issue aims to be an authentic experience of participation in Massachusetts' environmental protection community

What teams learn and practice as they prepare for their Current Issue presentation:

Key components:

- Community research skills
- Science/civics integration
- Apply school science knowledge to understand particular local environmental situations
- Issue identification and framing
- Knowledge of multiple strategy options for environmental problem-solving
- Presentation skills
- Teamwork

Additional learning opportunities:

- Initiative
- Community connection – people and places
- Knowledge of roles and interactions of levels of government, business, and nonprofit sectors on environmental issues
- Knowledge of diverse strategies for effective civic engagement
- Spatial thinking and mapmaking
- Local-global environmental issue connections
- Media literacy
- Data collection and analysis
- Imagination. Envision a different world. Reframe big issues. Question authority. Ask: *Why not?*

Beyond the competition: Recognition for learning that matters:
The Massachusetts Envirothon Community Research & Action Awards

Recognition

When your team works hard to prepare for your Envirothon Current Issue presentation, you deserve recognition for this work! And if your Current Issue research results in a service or action project that benefits your community, Mass Envirothon wants to recognize this, as well.

The Mass Envirothon Community Awards provide important recognition for your team, plus visibility for your school and your community. A letter of congratulations is sent to your principal, with copies to your coach, your superintendent, your state legislators, your community partners, local media, and the Secretary of Energy & Environmental Affairs. Teams who work to qualify for the awards tell us that they have a better Envirothon experience overall. Everybody wins!

These awards are optional and noncompetitive. They can be earned by any team that meets the award requirements. You and your coach are responsible for certifying the quality and completeness of your work. Your team can earn one or both of these awards:

- **The Massachusetts Envirothon Community Research Award** is presented to teams who have done thorough and wide-ranging community investigation in preparation for their

Current Issue presentations. To meet the standard for the award, you must show that you have been resourceful in using a range of research strategies -- exploring community places, talking to a variety of people, using maps, researching at the library and town offices, making scientific observations, and using the web.

- **The Massachusetts Envirothon Community Action Award** is presented to teams who take what they learn in their Current Issue research and use that knowledge to benefit their community. All kinds of action projects are possible: community education, advocating for change, collecting data, or hands-on conservation projects in the field. You might plug into an existing community effort or develop a project of your own. To be eligible for the Action Award, your team must first meet all the requirements for the Community Research Award. This demonstrates that you know what you are talking about!

Student-Led Civic Engagement projects

Environmental science and environmental justice are critical issues facing our communities and the world. As you undertake research for your Current Issue presentation, and particularly if you take that research into a Community Action project to make lasting change, your team is engaging in many of the components of **a new element of the Massachusetts high school curriculum: *student-led civic engagement projects***. The 2018 *Act to Promote and Enhance Civic Engagement* requires that:

- *Each public school serving students in the eighth grade and each public high school shall provide not less than 1 student-led, non-partisan civics project for each student . . .*
- *Civics projects may be individual, small group or class wide . . .*

There is more information here: Civics Projects Quick Reference Guide . Your coach or principal may have more information about how your school is meeting this new requirement, and how your Envirothon work can fit in.

2022 Massachusetts Envirothon Current Issue

Achieving a Zero Waste Future for Massachusetts

- Many building blocks for a zero waste future are in our hands today, but major changes in how we produce, distribute, sell, and use products and services as a society will be required.
- Achieving zero waste is particularly important because some of our communities bear more than their fair share of the negative consequences of our past and current waste management practices. This results in major health and economic consequences for the people who live there. Addressing these wrongs will be an important part of a zero waste future.
- The "circular economy" is a key concept for envisioning a zero waste future. Ecology tells us that there is no "waste" in Nature's economy. Barry Commoner's Second Law of Ecology states that: "Everything must go somewhere". Envirothon teams will find that their understanding of ecosystem science, and how we manage and use natural resources, will be important to imagining and engineering solutions.
- As we move toward the goal of zero waste, we will also be moving toward climate solutions, addressing energy issues, and promoting social and environmental justice.

2022 Current Issue
This year's challenge is on two levels

Envirothon teams do community research through the year. In March, they receive the final Current Issue "Problem" that they will respond to in their Envirothon presentations. The 2022 challenge will ask teams to propose Zero Waste action steps on two levels.

To prepare, teams should keep an eye out for solutions on both levels:

Individual and voluntary action. Zero waste will require individual voluntary commitment to significant change. What can you do in your individual life, in your family's household, to reduce waste? What can you do in your neighborhood or in your school to persuade others to change wasteful practices?

Government decision-making and policy. Zero waste will require collective commitment to change on a society-wide scale. Under a democratic system of governance, we the people decide together on our goals and how we will get there. Incentives and regulations are tools we can use to move our whole society toward our goals. What are the most successful and promising government initiatives? What new policies and regulations will help us move toward an environmentally just, zero waste future?

Some General Background on Solid Waste Management
Overview

- US EPA National Overview: Facts and Figures on Materials, Wastes, and Recycling
- US EPA Sustainable Materials Management Basics
- Mass DEP Recycling & Solid Waste Data for Massachusetts Cities & Towns
- Videos of the recycling process at the Springfield (Mass) Materials Recycling Facility (MRF)
- From US EPA: Examples and Resources for Transforming Waste Streams in Communities
- Recorded webinars from the Product Stewardship Institute. "Product stewardship" is the act of making products safer for people and the planet, from design to disposal.
- Some serious fun: **The Story of Stuff** exposes the connections between a huge number of environmental and social issues, and calls us together to create a more sustainable and just world.

Who is responsible for what aspects of waste management under our federal system of government?

- Federal Resource Conservation and Recovery Act (RCRA)
- State A Legislator's Guide to Municipal Solid Waste Management (1996). Old but still relevant regarding relationships among levels of government.
- National Conference of State Legislatures (NCSL): State and Federal Efforts to Revitalize Recycling (2020)

Resources specifically for Massachusetts K-12 Schools

- The Mass DEP Green Team
- RecyclingWorks for K-12
- Mass Farm to School Food Waste Audit & Resources

Big Ideas for the 2022 Mass Envirothon Current Issue

Waste as an Environmental Justice issue

- **From the US Environmental Protection Agency:** Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies.
- **From Massachusetts' Executive Office of Energy and Environmental Affairs:** All people have a right to be protected from environmental hazards and to live in and enjoy a clean and healthful environment.
    - **Map showing Environmental Justice communities and solid waste facilities in Massachusetts:**
- **A Boston-based community organization**: At Community Action Works, we believe that environmental threats are big, but the power of well-organized community groups is bigger.
- **Before European colonization**, indigenous communities were modeling many elements of a circular economy. What are their views on sustainability today?
- **Waste-pickers around the world** are doing essential environmental work. But do we want to live in a society that relies on waste-picking as a method of waste management?
- **This StoryMap** explores the relationship between marginalized communities and the location of landfills in Massachusetts

Zero Waste

- **Natural systems evolve to be closed-loop and waste-free. Human ones should take a cue from nature.**
- **Global Principles for Zero Waste Communities**
  Zero Waste programs are the fastest and most cost-effective ways that local governments can contribute to reducing climate change, protect health, create green jobs, and promote local sustainability.
- **The *Zero Waste Design Guidelines*** address the crucial role that design plays in achieving NYC's ambitious goal, outlined in OneNYC, to send zero waste to landfills by 2030.
- **The Institute for Local Self-Reliance**
  . . .we should not only invest in recycling and composting, but also in those other activities upstream, to redesign the systems and to set up reuse programs and reuse facilities, and help with innovations like fix-it clinics, and repair fairs . . .
- **How Communities Have Defined Zero Waste**

Circular Economy

- **Circular economy introduction –** lots of links and explanatory videos
- https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview
- **Is a world without trash possible?** The vision of a "circular economy"—where we use resources sparingly and recycle endlessly—is inspiring businesses and environmentalists alike.
- https://www.nationalgeographic.com/magazine/article/how-a-circular-economy-could-save-the-world-feature
- **Zero waste and circular economy concepts are often mixed up** or used interchangeably. . . . they are two different models that take approaches towards sustainability**.**
  https://www.zerowaste.com/blog/zero-waste-vs-circular-economy-a-guide/
- **Indigenous influences**: Before colonization, Hawai'i was an example of a working circular economy. A resolution advocating for a circular economy modeling traditional Hawaiian values was introduced

to the state Legislature last session thanks to the dynamic work of ‘Aina Aloha Economic Futures. https://www.ainaalohafutures.com/

- **Business sits at the heart of the transition to a circular economy**. https://ellenmacarthurfoundation.org/resources/business/overview
- **A sustainable business model is good for people, planet, and profit**. https://earthyb.com/blog/how-to-develop-a-sustainable-business-model/
- **The shaping of the circular economy should not be left to global corporations. It has to be owned by citizens and an enlightened civil society**, and it has to acknowledge the fact that complex problems do not have easy solutions. . . . Maximising recycling and re-use of materials is necessary, but cannot be a cure-all. To truly flourish, the circular economy needs to be part of a bigger effort to tackle economic growth, wasteful consumerism and undemocratic power structures in the global economy.

Life Cycle thinking and design

- *Our actions affect the environment in ways we may not understand when we decide what products to use and how we use them. . . . **We can better inform our choices with what is often called “life-cycle thinking,” which recognizes the importance of potential environmental effects at each stage of a product’s life** (that is, resource extraction, manufacture, use, and end-of-life management). Focusing on just one stage or one effect can be misleading. . . . Life-cycle thinking can also show that the “obvious” answer isn’t always the right one; for example, “non-recyclable” packaging can sometimes outperform recyclable packaging from an energy and resource perspective, if it’s significantly lighter and occupies less space – in this case, the benefits of more efficiently transporting the product may outweigh the lost recycling benefits. . . .*
- ***Waste is a design flaw**—in packaging, products, buildings, cities—the whole system is designed as a linear, cradle-to-grave consumption model. Ecosystems recycle materials indefinitely, in circular loops, but humans discard 99% of the materials we extract from the earth within six months. So as designers of our built environment, there are many things architects can do.*

Talking with People and Organizations in Solid Waste Management

A lot of the most important, up to date, relevant information you will get in your current issue research will come from PEOPLE, not books, not the web. Interviews will be a key element of your research.

Tips for Interviewing: Here are some things we have learned from listening to Envirothon teams talk about interviewing:

- When you do research in the community on the current issue, there will be lots of people who are happy to share what they know, but it will be up to YOU to ask the questions that will build your own understanding. Don’t just sit back and listen!

- There’s always an awkwardness at the beginning. You may feel embarrassed because you are not familiar with the terminology they are using. And you may not even feel familiar enough with the topic to ask good questions. You’ve got to push through that. The more questions you ask, the better you will get at asking them, the more familiar the language becomes, and the easier and more fun the research becomes.

- If you can interview these people in their native habitat (in their workplace) you are likely to have a better experience. The questions will come more naturally for you, and the interviewee will be more relaxed in show-and-tell mode.

- We learned during the pandemic that Zoom interviews can be almost as good as being there and are a lot easier to arrange.

In your research, aim for a *three-dimensional* perspective on the Current Issue.

Teams should aim for research that encompasses at least three different perspectives on the issue. Why should you look for "different perspectives"? Listening to differing viewpoints on an issue adds depth and breadth to your understanding. Differing viewpoints are not necessarily opposing views. They may stem from differences in

- disciplinary background (e.g. natural science or social science or engineering)
- scale of engagement (e.g. local vs regional),
- kind of engagement (e.g. field-based management, public education), or
- political or philosophical views (Their "Theory of Change" – see below).

A single person's perspective may have multiple dimensions, based on their experience. Different perspectives often lead people to recommend different solutions, or to emphasize different reasons for a solution.

Your understanding of this complexity will lead you to better potential solutions!

In your presentation, your team should be able to show that you have gotten inside the perspectives of the people you talked to. You should be able to represent these perspectives well.

What's their Theory of Change?

The idea of a Theory of Change (or Theory of Action) can be very useful in your community research interviews.

What do we mean by a Theory of Change?

We all have assumptions about the way the world works, and how change happens. These assumptions are often unstated and unexamined, but they form the basis of our choices for what we do.

Each one of the people you encounter in your research has waste management goals they are pursuing, and they have reasons for the choices they make and the actions they take. They make assumptions about the connection between what they want to see happen and the tactics they choose to get there. Often this theory of change is unstated and unexamined, but it is there.

Your Current Issue community interviews will be richer if you listen for, and ask about, each resource person's theory of change. Listen to what they say about

- What do they care most about, regarding waste management issues?
- What changes are most needed?
- How does change happen?
- What are the leverage points to effect change?

- How do they choose to engage?
- What do they count as success?

There are a variety of potential action strategies to address any environmental issue – some are more effective or comprehensive than others.

How are their choices of strategy affected by their knowledge, skills, and temperament? By their experiences and connections?

Paying attention to the theories of action held by the community resource people you interview will broaden and sharpen your understanding of the choices of strategy you can make in the quest for zero waste.

In many ways, the action steps you recommend in your Current Issue presentation, and your choices of whether and how to engage in an action project, will say a lot about YOUR theory of change.

Potential Resource People, Boards, Agencies, and Organizations

Municipal government
- Recycling Coordinator
- Waste Reduction Manager
- Department of Public Works (DPW)
- Board of Health (look for Regulations for Refuse Collection and Mandatory Recycling)
- Sustainability Committee
- Schools: perspectives from teachers, administrators, food service, custodial staff
- Select Board or Town/City Council

State government
- Massachusetts Department of Environmental Protection (DEP)
- Massachusetts Department of Agricultural Resources (MDAR) – agricultural waste
- YOUR STATE LEGISLATOR *(for example – see links below - what do they think of the proposed legislation on EPR and the "better bottle bill"?)*

Federal government
- Environmental Protection Agency (US EPA)
- Natural Resource Conservation Service (USDA NRCS)
  - Agricultural Waste and Nutrient Management Systems

Environmental businesses
- Types of businesses to look for in your community include:
  - Waste & recycling collection
  - Composting operations
  - Hazardous waste clean-up

Organizations advocating for Zero Waste at the state level
- MassPIRG (Massachusetts Public Interest Research Group)
- Conservation Law Foundation (CLF) Zero Waste Project
- Center for Ecological Technology (CET)
- Zero Waste Massachusetts (a coalition of advocacy organizations)

Networking organizations

Mass Recycle is a statewide coalition of individuals, all 351 municipalities, the recycling industry, and other green organizations dedicated to increasing recycling and waste reduction in the Commonwealth of Massachusetts.

The Environmental Business Council of New England (EBCNE) provides a good link to large and small businesses involved in solid waste management.

The NCF Envirothon Current Issue

The National Conservation Foundation (NCF) sponsors the North American Envirothon competition.
The 2022 Current Issue is "Waste to Resources"

Key NCF Topics – Background for the 2022 NCF competition

- Landfills & hazardous materials
- Reuse, Recycling, and Waste Diversion
- Composting & Food Waste
- Combustion with Energy Recovery (waste-to-energy)
- Human & Animal Waste Treatment
- Brownfields & Restoration of Degraded Lands

Notable Zero Waste Topics for Massachusetts teams to consider:

PLASTIC

Science 101: Plastics (from National Geographic)
Once a completely natural product, much of today's plastic is man-made and largely dependent upon fossil fuels. From polymers to nurdles, learn how plastic is created and what we can do to slow the lasting repercussions this material will have on both our planet and our lives.
The Complete Plastics Recycling Process
Circular examples collection: Plastics
Eliminate unnecessary plastics, innovate to ensure that those we do use are recyclable, compostable or reusable and circulate plastic items so they stay in the economy and out of the environment. But what does this look like in reality?
Documentary film: ***Plastic Wars*** (2020)
With the plastic industry expanding like never before and the crisis of ocean pollution growing, FRONTLINE and NPR investigate the fight over the future of plastics.
The New Coal: Plastics And Climate Change *. . . a comprehensive account of the United States plastics industry's significant, yet rarely acknowledged contributions to the climate crisis. Using coal-fired power plants as a benchmark, the report examines ten stages in the creation, usage, and disposal of plastics: fracking for plastics, transporting and processing fossil fuels, gas crackers, other plastics feedstock manufacturing, polymers and additives production, exports and imports, foamed plastic insulation, "chemical recycling", municipal waste incineration, and plastics in the water.*
The Plastic Industry Is Growing During COVID. Recycling? Not So Much.
Unlike most industries during COVID-19, plastic manufacturers are seeing production increase in the midst of a global economic downturn.
From the *Story of Stuff Project.* Hard-hitting, catchy, activist-oriented perspective on plastic.

- ***Story of Plastic***. *Animated short*

- ***Story of Plastic***. *Documentary film*
- ***Changemaker Personality Quiz: Story of Plastic Edition***. *See the role you can play in your community and beyond. Whatever you have to offer, a cleaner, healthier future needs it!*

Plastic in the environment and in us

- *New technique expected to enable scientists to find accumulated microplastics in humans*
- ***How to Eat Less Plastic*.** From *Consumer Reports*: *Each of us might ingest up to a credit card's worth of plastic weekly through food and water.*
- *The plastic-coated paper products currently being collected by many composting programs produce both macro- and micro-fragments of non-biodegradable plastic which contaminate the finished compost.*

***A Rust Belt city debates a growing plastic future*.** An environmental justice case study.
The New Plastics Economy *aims to create long-term systemic value by fostering a working after-use economy, drastically reducing leakage and decoupling plastics from fossil feedstocks.*
Carbon benefits from plastic? *Plastics do have a large carbon impact - accounting for 3.8% of global greenhouse gases emissions - but it is wrong to assume that alternative packaging materials would perform better, and it is important to consider the carbon benefits that arise from plastics use.*

RECYCLING

China Doesn't Want the World's Trash Anymore. Including 'Recyclable' Goods.

Resources specific to Massachusetts
Recycle Smart Includes Recyclopedia, FAQ for Massachusetts, and media resources
How & Where to Recycle. Learn which materials belong in your bin, where to recycle or donate other items, and what to throw away. Do your part and recycle smart to enhance the environment, boost the economy, and save your community money.
This map and list displays Materials Recovery Facilities (MRFs) in Massachusetts. A MRF is a recycling facility that receives mixed recyclables (i.e., containers and paper products) and mechanically sorts and
Massachusetts Recycling Markets Update
Chinese Government restrictions on imports of recyclable commodities have had dramatic effects on recycling in Massachusetts, across the country, and around the world. Learn about these and other market challenges, and how MassDEP is helping municipalities, haulers, and processors meet them.
Get the MassDEP Recycling IQ Kit. If your community is dealing with recycling contamination challenges, the Recycling IQ Kit might be for you.
RecyclingWorks in Massachusetts is a recycling assistance program funded by the Massachusetts Department of Environmental Protection and delivered under contract by the Center for EcoTechnology that helps businesses and institutions reduce waste and maximize recycling, reuse, and food recovery opportunities.
Recycling & Composting for Kids, Teachers & Schools
Learn about effective school recycling and composting programs. Enroll your class or school in the **MassDEP Green Team**.

FOOD

The Food Recovery Hierarchy prioritizes actions organizations can take to prevent and divert wasted food.
Hierarchy to Reduce Food Waste & Grow Community (another version of the hierarchy)

The Massachusetts Food System Collaborative facilitates a network of organizations that are helping to reduce wasted food in Massachusetts, including food rescue organizations, gleaning organizations, composting organizations and farms, and environmental groups.

White Paper on Food Waste Reduction - April 2021

The Collaborative is tracking several bills in the 2021-22 Legislative session related to food waste.

Reducing Food Waste in Massachusetts: Local Successes Informing Statewide Solutions

Municipal Approaches to Reduce Food Waste in MA

There are many options available to municipalities to help reduce food waste; some ideas are listed below, organized by EPA's hierarchy that prioritizes certain food waste reduction responses. Whether these approaches are appropriate may depend on the town's location, population density, existence of a transfer station, and other resources.

ENERGY RECOVERY (WASTE TO ENERGY)

Background from EPA: Energy recovery from waste is the conversion of non-recyclable waste materials into usable heat, electricity, or fuel through a variety of processes, including combustion, gasification, pyrolization, anaerobic digestion and landfill gas recovery. This process is often called waste to energy.

Background from Mass DEP: Municipal Waste Combustors - There are seven waste-to-energy facilities in Massachusetts. Together, they burn more than one-third of the solid waste generated in our state. This guide provides an overview of the role they play in our state's waste management system, how they operate and are regulated, and the progress they are making toward reducing their emissions of targeted air pollutants.

Waste-to-energy is a waste management option (U.S. Energy Information Administration): Producing electricity is only one reason to burn MSW. Burning waste also reduces the amount of material that would probably be buried in landfills.

Burning Trash to Create Energy is Not the Solution (Conservation Law Foundation, 2020) Our Waste Problem and Climate Crisis Will Not be Fixed by "Dirty" Energy

September 29, 2021 (BOURNE, MA) – The Cape Cod Commission has approved plans to expand the Bourne Ash Landfill. The polluting facility mainly buries incinerator ash from Covanta's SEMASS incinerator in Rochester, Massachusetts as well as some municipal solid waste from the Cape. Conservation Law Foundation (CLF) and Sierra Cape Cod released the following statements in response.

Wheelabrator Technologies owns and operates modern waste-to-energy facilities. Unlike conventional power plants, these sophisticated facilities safely and effectively convert heterogeneous waste materials into clean, renewable energy and useful byproducts, while sustainably powering communities and protecting the environment.

Waste-to-Energy from Municipal Solid Wastes (U.S. Department of Energy (DOE) , Office of Energy Efficiency & Renewable Energy, 2019) This report assesses potential research and development (R&D) activities that could improve the economic viability of municipal solid waste-to-energy facilities

Burned: Why Waste Incineration Is Harmful (Natural Resources Defense Council, 2021) Congress must avoid ideas disguised as environmental advances that actually threaten public health and the environment. One example is the bundle of troubling technologies that all involve waste incineration, such as "waste-to-energy" or many forms of "chemical recycling" (processes frequently used to convert plastics into fuel that is then burned).

Beyond Incineration: Best Waste Management Strategies for Montgomery County, Maryland (Energy Justice Network, 2021) Prioritizing: • Cost-effectiveness • Human health & safety • Climate protection • Continuous waste reduction

9 reasons why we better move away from waste-to-energy, and embrace zero waste instead (Zero Waste Europe) Waste incineration is often presented as a smart way to make our trash problem disappear, and even create energy in the process. However, research shows that this is far from the truth.

WASTE IN THE SOLAR/ELECTRIC ECONOMY

Solar panels are starting to die. What will we do with the megatons of toxic trash? Most solar manufacturers claim their panels will last for about 25 years. That means the solar e-waste glut is coming.
How to Recycle Solar Panels, Lithium Batteries, and Electronics
Solar Photovoltaic Module Recycling: A Survey of U.S. Policies and Initiatives

SOME CONSUMER PROBLEMS & SOLUTIONS

Reuse and Repair

Freecycling

How the Freecycle Network Works. If you want to give away your old laptop and be part of a potential revolution in the process, you might turn to Freecycle.org. The Freecycle Network hopes to encourage a "worldwide gift economy" -- one old laptop, bottle of nail polish, gas stove or People magazine at a time. In this article, we'll find out how the Freecycle Network got started, how the process works and how you can start giving your unwanted stuff away to people who'll use it.
Welcome to The Freecycle Network™! We are a grassroots & entirely nonprofit movement of people who are giving and getting stuff for free in their own Towns. It's all about reuse and keeping good stuff out of landfills.

Right to Repair + fix it yourself

iFixit is a global community of fixers. This site is designed to help people—from first-time fixers to pros—fix more stuff. Our online community is the core of iFixit. We're all here to be helpful. So, ask a question. Answer a question. And hang out with us for a while!
Massachusetts Municipal Reuse & Repair Programs. Reuse and repair extend the useful lives of many items, conserve natural resources, reduce waste disposal, and save people and communities money.
MassPIRG Report: ***What are Bay Staters Fixing?*** ***The devices Massachusetts residents tried to fix in 2020 and why it's harder to repair than it should be.***
Voters Overwhelmingly Passed a 'Right to Repair' Law in Massachusetts. Carmakers Are Fighting Back. . . . now they're getting into some security concerns.

Boston Globe **EDITORIAL**. **Massachusetts Legislature should pass 'right to repair' bill.** Right-to-repair laws are better for consumers, small businesses, and the environment. The Legislature has no reason to oppose them.

Clothing and textiles

Fast Fashion (from Wikipedia) Much clothing produced under the fast fashion model is lower quality thus harder to reuse or recycle. Moreover, the rapid and cheap production processes of fast fashion create increased pollution and other environmental and social impacts.

ULTRA-FAST FASHION IS EATING THE WORLD (*The Atlantic*, 2021)

What happens to the stuff you order online after you send it back? (*The Atlantic*, 2021)

Circular examples collection: Fashion. Each year millions of tonnes of clothes are produced, worn, and thrown away. To solve the problem, we must reinvent fashion itself. This means developing innovative production systems, materials and business models that allow clothes to have less impact on the environment, to be worn longer and be turned into new clothes when they are no longer needed.

Why clothes are so hard to recycle. Fast fashion is leading to a mountain of clothing being thrown away each year and has a huge impact on the environment, so can we turn our unwanted garments into something useful?

MassDEP Textile Recovery. Learn what the state is doing and what you can do to keep clothing, footwear, bedding, curtains and other textiles out of landfills and incinerators. Help put them into the hands of new owners or recycle their fibers into other products.

A new textiles economy: Redesigning fashion's future. The time has come to transition to a textile system that delivers better economic, societal, and environmental outcomes. This report outlines a vision and sets out ambitions and actions – based on the principles of a circular economy – to design out negative impacts and capture a USD 500 billion economic opportunity by truly transforming the way clothes are designed, sold, and used.

Packaging

Containers and Packaging: Product-Specific Data from the EPA. EPA defines containers and packaging as products that are assumed to be discarded the same year the products they contain are purchased. Containers and packaging make up a major portion of municipal solid waste . . . This web page provides an overview of data on containers and packaging in municipal solid waste

Why Reduce Wasted Food and Packaging? Together, food and packaging/containers account for almost 45% of the materials landfilled in the United States, and some of these discarded materials are food-related packaging and containers.

What is Sustainable Packaging?

The Better Bottle Bill Campaign gains steam

Extended Producer Responsibility (EPR)

- From Wikipedia: *In the field of waste management, **extended producer responsibility** (**EPR**) is a strategy to add all of the environmental costs associated with a product throughout the product life cycle to the market price of that product.*
- From the Massachusetts Municipal Association: **Extended producer responsibility seen as strategy to counter rising recycling costs.**
- A Global Perspective: EPR has the potential to benefit the environment and to generate decent work in waste management. But for the world's 22 million informal waste workers, EPR can be harmful. Waste pickers manage 30-80% of the waste in many cities, but **EPR is sometimes designed in ways that create barriers to the participation** and recognition of waste pickers in the system.

A CIRCULAR BIOECONOMY?

The transition to a circular bio-economy is essential for a sustainable future. A circular bio-economy uses fewer natural resources, has lower emission levels, and will improve the nature-inclusivity and biodiversity of the food system compared to the current systems. . . . The circular bio-economy is based on three leading principles:

1. Our circular food systems are built on plant-based biomass obtained from land and water
2. Byproducts from plant-based biomass, known as waste flows, are to be avoided. If this is impossible, they must be redirected back into the bio-economy, with healthy soil as a priority. Furthermore, they can be used as biomaterials or cattle feed
3. The function and role of animals is to return biomass that is unsuited for human consumption into the food system

Transferring to a circular bio-economy cannot be done without significant changes, on all fronts.

Nature-Based Solutions and Circularity in Cities. Cities worldwide are facing a number of serious challenges including population growth, resource depletion, climate change, and degradation of ecosystems. To cope with these challenges, the transformation of our cities into sustainable systems using a holistic approach is required. . . . the adoption of the circular economy (CE) model is proposed, which provides economic growth without increasing the consumption of new resources and reducing the impact on the environment. At the core of CE are the three principles identified by the Ellen MacArthur Foundation, namely, 'Regenerate natural capital', 'Keep resources in use', and 'Design out waste externalities'.

Why wood is the most important material for the circular economy. Wood is a natural material, available in large quantities and is easy to produce, making it the perfect material to consider for the circular economy. The Institute for Materials and Wood Technology (IMWT) at the Bern University of Applied Science are transforming the ways in which we can use wood to benefit the circular economy. With a focus on sustainable use of resources, their research and development has led to minimal wood waste; from making new uses for low quality wood that cannot be sold, all the way through to the production of adhesive from wood extraction.

Composting for Community. Advancing local composting to create jobs, enhance soils, protect the climate, and reduce waste. Webinars from the Institute for Local Self Reliance

Anaerobic Digestion Case Studies
Some Massachusetts examples and uses of anaerobic digestion, including agricultural, industrial, and wastewater treatment plants sites.

Agricultural Waste and Nutrient Management Systems. The following conservation practices are commonly used to minimize water quality impacts associated with agricultural wastes and nutrients.
Soil, properly managed, can serve as an effective buffer between potential pollutants in manure and air and water resources. The manure, properly applied, can also be used to improve soil health and recycle nutrients for plant growth.
Guide to Agricultural Composting (Massachusetts Department of Agricultural Resources).These guidelines are intended for Massachusetts farmers engaged in agricultural composting and, more specifically, for those who wish to compost materials not generated from their own farming operations.

EVEN MORE(!) WASTE ISSUES

Brownfields cleanup and redevelopment
Wastewater (sludge and biosolids)
Hazardous Waste
Disposal of Unused Medicines
Wood burning power plants
Buildings and construction/demolition
Disaster debris management

Current Initiatives in Massachusetts

Executive/Regulatory initiatives

Massachusetts 2030 Solid Waste Management Plan

The Massachusetts 2030 Solid Waste Management Plan (SWMP) establishes the Commonwealth's policy framework for reducing and managing solid waste that is generated, reused, recycled, or disposed by Massachusetts residents and businesses. The 2030 Solid Waste Master Plan (2030 Plan) proposes a broad vision and strategies for how the Commonwealth will manage waste over the next decade and beyond. Sections include

- Goals and Policies for 2020-2030
- Ongoing Engagement on Plan Implementation and Measuring Progress
- Major New and Expanded Initiatives in
  - Source Reduction and Reuse
  - Organics Waste Reduction
  - Residential Waste Reduction
  - Commercial Waste
  - Construction and Demolition (C&D) Materials
  - Waste Reduction Market Development
  - Solid Waste Facility Oversight and Capacity Management

Public comments on the 2030 SWMP, with DEP responses

News Releases:

Massachusetts Municipal Association (10.18.21): *New Solid Waste Master Plan emphasizes waste reduction: . . . At the plan's unveiling, Gov. Charlie Baker said it "will significantly improve the Commonwealth's waste management system and provide important environmental, climate and economic benefits." He noted that the plan sets "new, aggressive state-level waste reduction goals that align with our carbon emission reduction programs, invest in innovation, and enhance ongoing engagement with communities across the Commonwealth."*

Zero Waste Massachusetts (10.18.21) *Too little too late: Statement from Zero Waste Massachusetts on the Department of Environmental Protection's just released 2020-2030 solid waste master plan. . . Our coalition has been working for zero waste in MA for over a decade. While we appreciate that the DEP has put the term 'zero waste' in the Plan's subtitle, the policies in the plan should be more ambitious if we are to achieve the environmental, public health and equity goals that the residents of the Commonwealth want.*

MassDEP Waste Disposal Bans

"Waste Bans" are prohibitions on the disposal, transfer for disposal, or contracting for disposal of certain hazardous and recyclable items at solid waste facilities in Massachusetts. . . . Waste bans boost recycling and support the recycling industry, which contributes thousands of jobs and millions of dollars to the Massachusetts economy. By cutting down on disposal, the waste bans also help us capture valuable resources, save energy, reduce greenhouse gas emissions, and lessen our reliance on landfills and incinerators.

MassDEP will expand its current waste disposal bans in 2022 by:

- Lowering the threshold on commercial organic/food waste to facilities generating more than one-half ton of these materials per week; and
- Adding mattresses and textiles to the list of materials banned from disposal or transport for disposal in Massachusetts.

Proposed Legislation

Extended Producer Responsibility (EPR)

On July 13, 2021, Maine became the first state to sign Extended Producer Responsibility (EPR) legislation into law for plastics and packaging materials, and Oregon passed a similar law on August 6, 2021. This reflects a growing momentum towards EPR legislation nationwide. Several of these state bills require producers to pay for a portion of the costs of recycling materials that they put into the market.

- **Massachusetts Proposed EPR Plastics and Packaging Bills** – S.610 / H.D. 1553. Requires producers of plastics, metal, paper, cartons, and glass to pay recovery costs for products based on a state-implemented system. The system establishes the amount producers are required to pay, which is determined by the net cost of recycling collection and processing costs. Retailers and distributors may not sell, offer for sale, use, or distribute covered materials if the producer of the material is not in compliance with the bill.

  Massachusetts Product Stewardship Council (MassPSC) is a formal committee of MassRecycle with the goal of shifting the costs of materials management and recycling from taxpayers to the companies that design and market products through product stewardship and extended producer responsibility. . . . One of the most effective ways that municipalities can voice their support for extended producer responsibility (EPR) laws is to pass a resolution. Both the Massachusetts Municipal Association and state legislators pay attention to resolutions that municipalities pass. MassPSC is urging municipalities to pass a resolution to support EPR. **Use the Municipal EPR Resolution Template** to get started in your community.

THE BETTER BOTTLE BILL: CAMPAIGN LAUNCH. The 1982 law is one of the state's most effective recycling measures, but after nearly 40 years it is in need of updates to more efficiently reduce waste, litter, and municipal costs for disposal and clean up in the Commonwealth. This Better Bottle Bill brings us back to the future, by capturing beverage containers that didn't exist in 1982---like water bottles, juices, sports drinks, iced teas and others.

Advocates renew plans to expand bottle bill. Several years after failing at the ballot box, a proposal to update the state's 5-cent "bottle bill" has resurfaced on Beacon Hill, where environmental and consumer advocates are pushing again to expand the decades-old law.

AND FINALLY:

Some worthwhile **search term sidetracks(?)** to broaden your thinking:

- Garbology
- Freeganism
- Planned obsolescence
- Buy Nothing day
- The Sharing Economy

Some useful and fun perspectives from **HISTORY**

- **The most amazing thing about garbage collection** is the fact that it was there in the beginning and it will be there in the end.
- **A midden is the archaeological term for trash or garbage heap**. Middens are a type of archaeological feature, consisting of localized patches of dark-colored earth and concentrated artifacts which resulted from the deliberate discard of refuse, food remains, and domestic materials such as broken and exhausted tools and crockery. Middens are found everywhere humans live or have lived, and archaeologists love them.
- **Disposable America: Explore the History of Disposability Through Object Stories**
- **Worcester once employed up to 8,000 pigs to dispose of city's garbage**
- **How We Created a Throwaway Society**