

BRESCO Incinerator Final Presentation

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Introduction

- **BRESCO** – Baltimore Refuse Energy Systems Company
- Contract Renewal set for **2021**
- Chesapeake Climate Action Network (CCAN) investigating how to fight the contract renewal
- Multidisciplinary analysis of the incinerator, its operations, and its impacts on the City, natural resources, and the environment
 - Overall, research and analyses support challenging the contract renewal



Project Review: Project Goals

- **Objective 1:** Gather all information regarding the operation of the incinerator and the various stakeholders involved
- **Objective 2:** Research where the waste would be sent instead of incinerated, the potential implementation of a Zero Waste Plan, and how certain municipalities have operated after decommissioning their incinerators
- **Objective 3:** Synthesize research and compile data supporting challenge of the contract renewal that includes alternatives to the incinerator

Findings

- BRESCO Employment Information
- Waste Incineration Contract/Costs
- County Waste Information
- Waste Composition Information
- Energy Generation/Output
- Alternative Energy
- BRESCO Governance
- BRESCO Emissions
- Natural Resource/Environmental Impacts
- Environmental Justice
- Alternative Waste Solutions

BRESCO Employment Information

Salaries and Benefits:

- BRESCO has **65** Full time employees
- **7** employees needed for daily operations
- Only **15%** of employees live within city limits
- These employees are **not unionized**
- Employee salaries approximately range from **\$12.37 per hour** for Shift Manager to **\$18.37 per hour** for Utility Operator
- BRESCO's employees all receive **standard employee benefits**

Waste Incineration Contracts/Costs

- **Baltimore City/County Contract:**

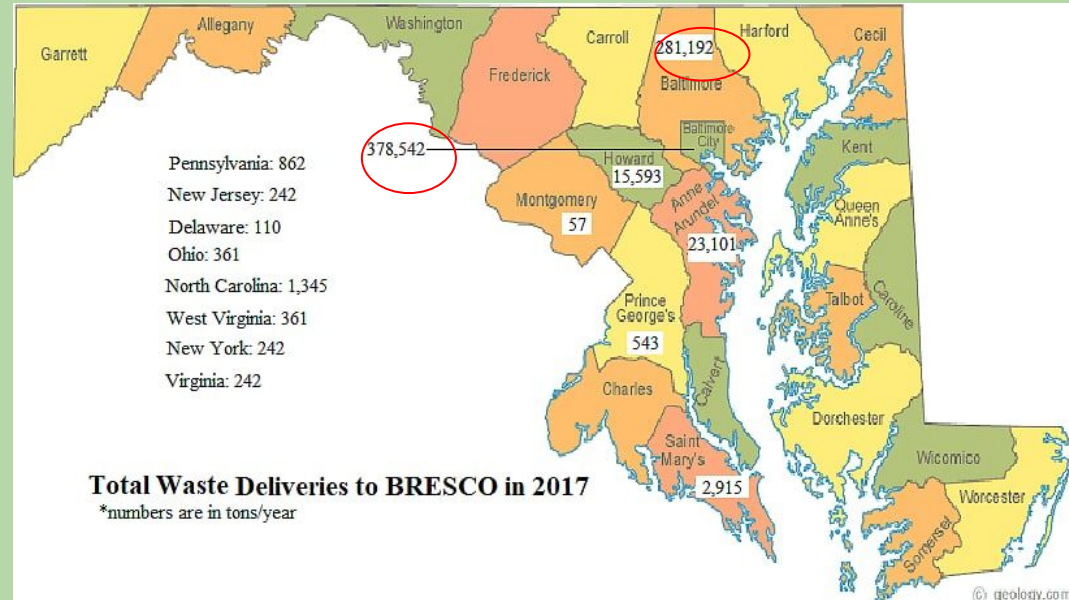
- Contracts were negotiated between Northeast Maryland Waste Disposal Authority (NMWDA), Wheelabrator Baltimore, and Baltimore City
- Current contract has **10-year initial term** (expires 12/31/2021)
- Contract can be renewed in **three 5-year renewal periods** following the initial term

- **Costs:**

- Cost of sending residential waste to BRESCO was **\$44/ton of MSW** in 1st year of current contract
- Cost **increases** by roughly **\$1-2/ton of MSW** every year
- Based on MSW amounts and costs provided by NMWDA, residential MSW disposal at BRESCO cost:
 - Baltimore City spent over **\$8 million** in 2017
 - Baltimore County spent over **\$12 million** in 2017

County Waste Information

- The **primary jurisdictions** that send waste to BRESKO: **Baltimore City and County**
- Baltimore City and County are the **only** jurisdictions that send residential and commercial waste
- All other jurisdictions send solely commercial waste



Waste Composition Information

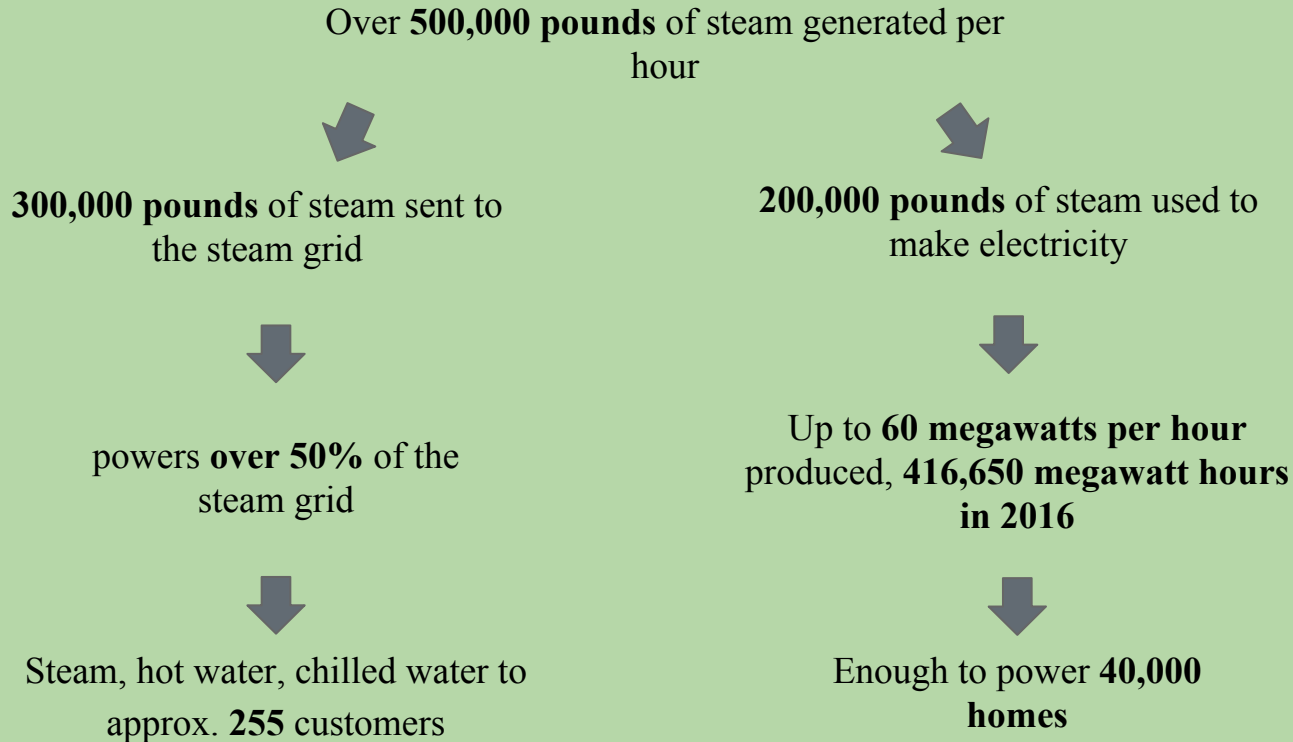
- The BRESKO facility primarily incinerates **residential and commercial trash** from **Baltimore City and Baltimore County**.
- Residential and commercial waste consists of paper, cardboard, plastic packaging, plastic and glass containers, food wastes, and yard wastes.
- About **80%** of the waste incinerated at BRESKO is **recyclable/compostable**.



Waste Histogram from 2017 BRESKO Recycling Report



Energy Generation and Output



The Steam Grid

- Built in early 1900s. Run by Veolia, a French company that runs many privatized infrastructure projects all over the world.
- Incinerator supplies **300,000 pounds** of steam
- Veolia claims the steam grid reduces Baltimore's total emissions by **47,000 tons** of CO₂ per year - does not take BRESCO's GHG emissions into consideration
- Including Bromo Seltzer Tower, M&T Bank Stadium, National Aquarium, Baltimore Convention Center, Transamerica Tower, University of Maryland Hospital, Maryland Historical Society



The Steam Grid

Potential threats of **explosion**

- In 2017 the steam pressure broke through concrete slab in the roadway and occurred in a pipe parallel to a gas line.
- **33** vehicles damaged, **5** people injured
- Asbestos released into the air



Alternative Energy Providers



Steam:

- Veolia has seven plants in Baltimore City and currently supplies the **other 50% of the steam grid**
- Exelon and Baltimore Gas and Electric Company already have plants in Baltimore

Electric:

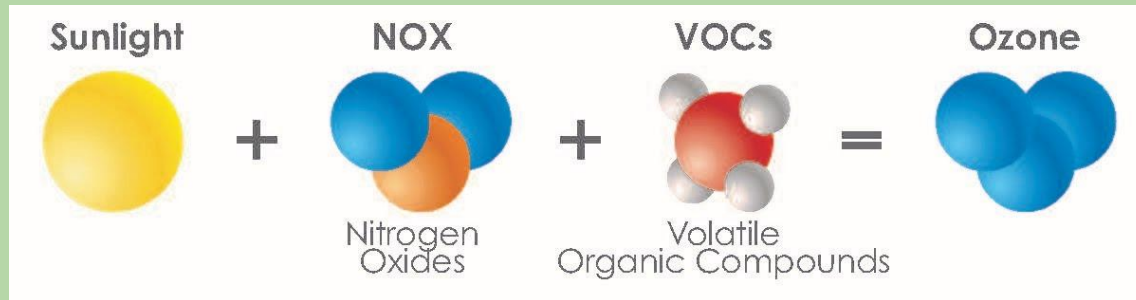
- Constellation: An Exelon Company
- Startex
- Trigen Energy Corporation (owned by Suez)

Environmental Laws Governing BRESCO

- Regulated by the EPA under the **Clean Water Act (CWA)**, **Clean Air Act (CAA)**, the **Resources Conservation and Recovery Act (RCRA)**, and the **Safe Drinking Water Act (SDWA)**. No record of any cases brought against the incinerator by the EPA
- In 2011, Wheelabrator was **fined \$77,500 by the Maryland Department of the Environment** for failing to control the release of toxic mercury into the air.

BRESCO NO_x Emissions

- The incinerator emits a large amount of **nitrogen oxides**, which are detrimental to the environment and facilitate the creation of ozone
 - Ozone has **negative health effects** and can cause respiratory issues
 - Baltimore has historically measured some of the **highest ozone levels** on the East Coast
- NO_x emissions also contribute to **nitrogen deposition in the Chesapeake Bay**
- BRESCO is the **one of the highest emitters of NO_x** in the state
 - Will need to reduce its emissions to comply with new EPA standards for ozone



COMAR Amendment 26.11.08: New Standards

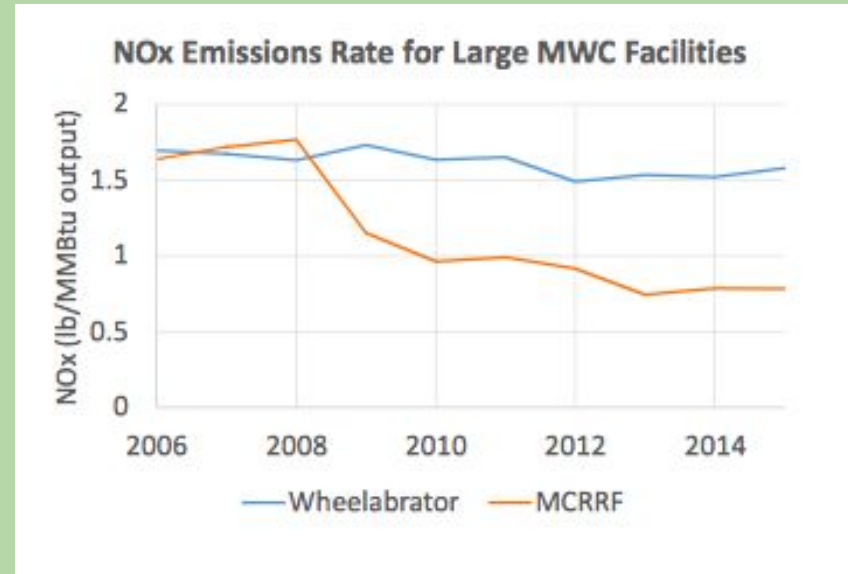
- MDE Proposal in August of 2018, went into effect in December
- May 1st, 2019: Reduce NOx emissions to **150 ppm**
- May 1st, 2020: Reduce NOx emissions to **145 ppm**
- 2019 Limit: **900 tons** NOx emissions
- Current: **1,100 tons** of NOx emissions annually
- January 1, 2020: Submit a feasibility analysis regarding additional control of NOx emissions

Current Emissions Records for BRESCO

Year	NOx Tons	Long Term (Annual) Average NOx 24-Hr Block Concentration
2013	1067	169 ppm
2014	1076	162 ppm
2015	1123	168 ppm
2016	1141	169 ppm
Average	1102	167 ppm

BRESCO vs. MCRRF

- MCRRF: Montgomery County Resource Recovery Facility
- Incinerators roughly the same size
- BRESCOs limit is **150 ppm**, while MCRRF's is **140 ppm**
 - Due to the age and capacity of BRESCO
 - BRESCO does not have state of the art pollution controls like MCRRF
 - By January 1st 2020, BRESCO will need to submit a feasibility analysis regarding additional controls for NOx emissions



Operations Relevant to Natural Resources

- While mostly in compliance with regulations, operations still have negative impacts
- Operations impacting resources:
 - Combustion of MSW (**2250 tons** per day)
 - Ash generation (~**202,664 tons** per year produced)
 - Air pollutants, most notably **NO_x**
 - Water Use:
 - Authorized for withdrawal of **64 MGD**
 - Regulated under CWA 316(b)



Source: EA Engineering, Inc.

Operations' Impacts to Natural Resources

- MSW Incinerator ash is **biotoxic**; contains leachable heavy metals like Copper, which could potentially cause local aquatic impacts
- **11,250 tons** of Nitrogen pollution enters Bay as air deposition of NO_x
 - BRESCO creates **1075 tons**, or **9.5%** of this per year
- **64 MGD** withdrawn from Gwynns Falls, an impaired watershed
 - BRESCO has not performed required study required under CWA Section 316(b)
 - Current through-screen intake velocities at **0.83 fps** (generous)



Source: Chesapeake Bay Foundation



Source: www.lawandenvironment.com

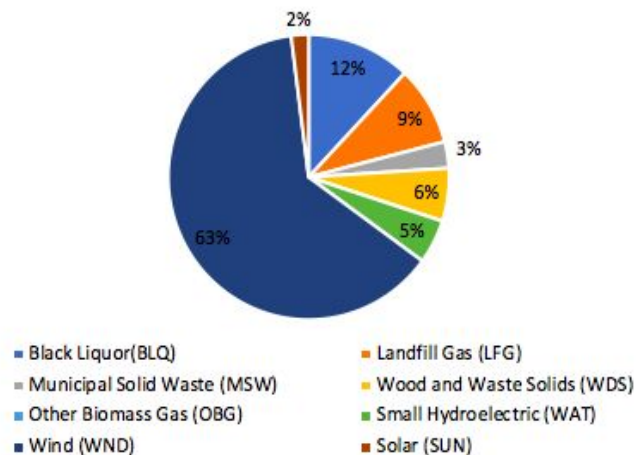
Role in Maryland's Renewable Portfolio Standard (RPS)

- **Tier 1** designation in RPS
 - Wind, Solar same tier
 - Dirtier than coal per unit of electricity generated
- **#1** Baltimore emitter of total air pollution as well as specifically, mercury, NOx and SO₂
 - **Top 12** in MD for all the above
- **'Greenwashed'** as "waste-to-energy"

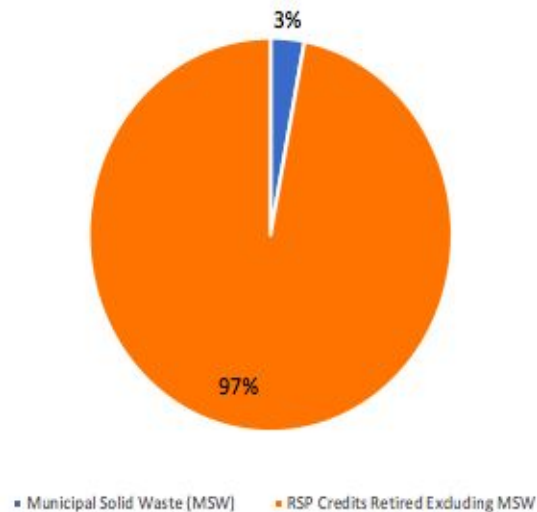
	BRESCO Ranking: Baltimore	BRESCO Ranking: Statewide
Total Air Pollution	#1	#12
Mercury	#1	#4
Sulfur Dioxide (SO₂)	#1	#9
Nitrogen Oxides (NO_x)	#1	#11

Composition of Maryland's RPS

RPS Credits Retired in Maryland 2017



Maryland Retired RPS Credits Sources 2017

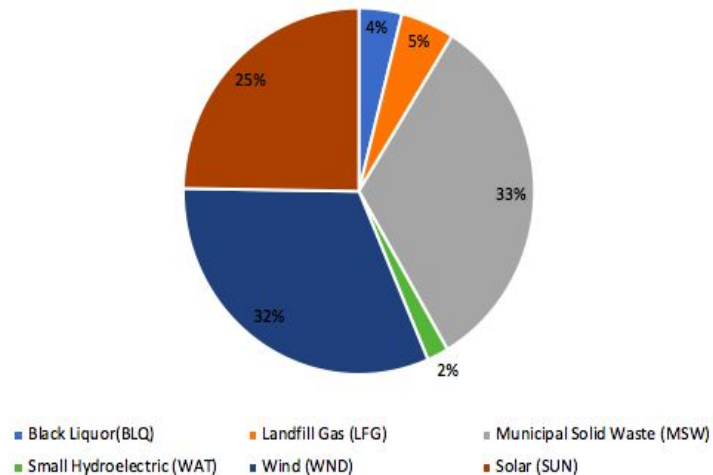


Graphs Made with data from PJM Generation Attribute Tracking System

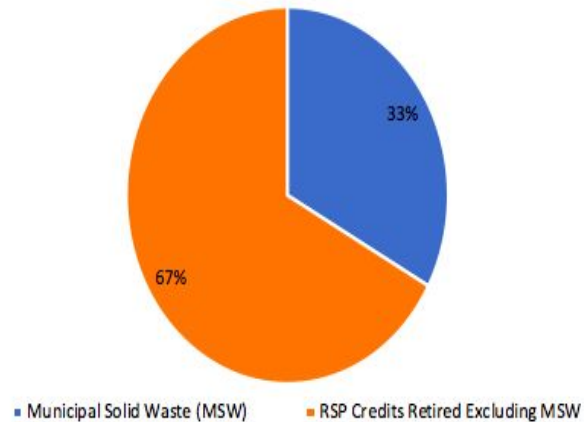
<https://gats.pjm-eis.com/GATS2/PublicReports/RPSEligibleCertificatesByStatusReportingYear/Filter>

In-State Generated RPS Credits 2017

In-State Generated RPS Credits Retired 2017



In-State Generated RPS Credits Retired 2017



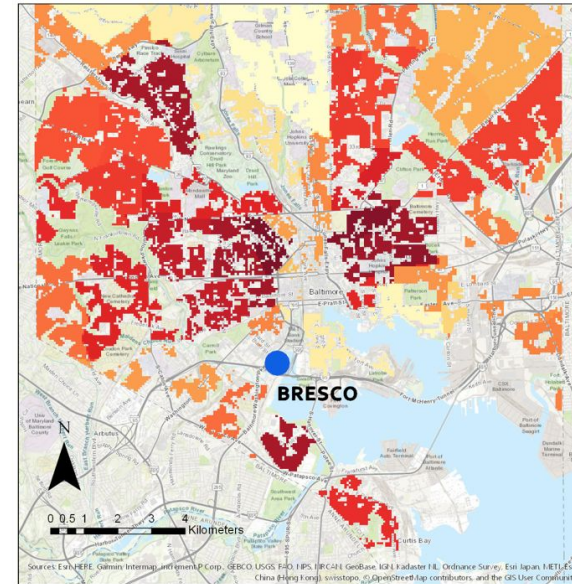
Implication of Green Energy Label

- BRESCO has collected over **\$10 million** through state renewable energy incentives despite being a large scale polluter
- Money for the subsidies is sourced from Maryland residents' electricity bills
- **Bipartisan support** in Maryland senate to strip BRESCO of green energy label in 2018 -- didn't pass
- Clean Energy Jobs Act of 2019 will again attempt to **remove subsidies** to the incinerator

Environmental Justice Issues

- Variables
 - Infant Mortality
 - Birth Weight – Satisfactory or Not
 - Average Life Expectancy
 - % African American in Community
 - Unemployment Rate
 - Households Earning <\$25,000
 - % Adults With Less Than High School Education or GED
- High correlation with justice concerns in neighborhoods closest to BRESCO
 - **Environmental Justice concern**

The BRESCO Incinerator and Its Relationship to Environmental Justice



Environmental Justice Concern

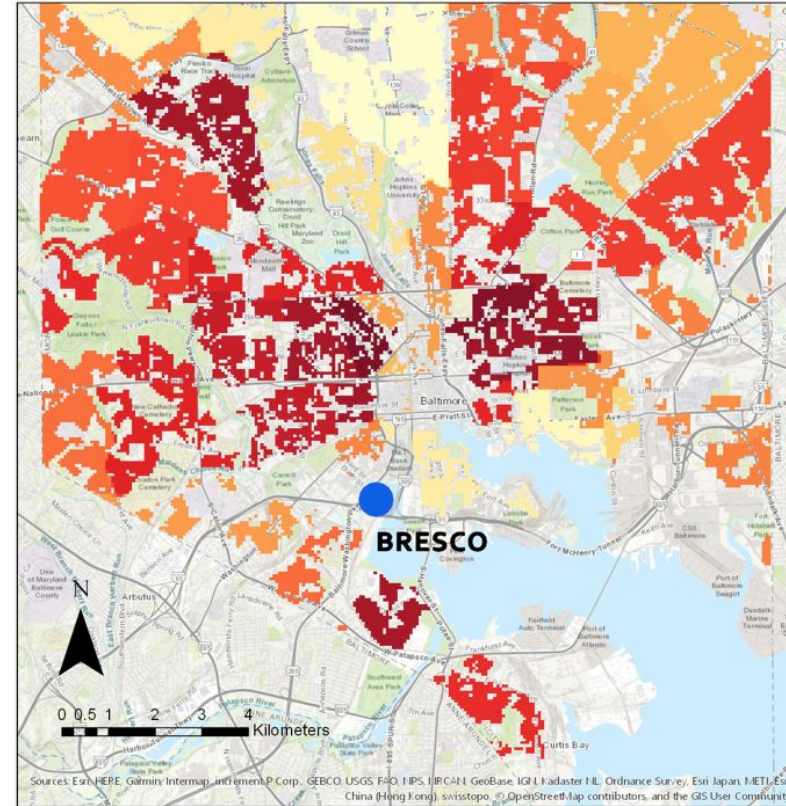


This map illustrates the relationship between the BRESCO incinerator in Baltimore, MD and environmental justice. The level of environmental justice concern was found by using a weighted sum analysis of 7 variables measured across all the neighborhoods in Baltimore: the percentage of babies born of satisfactory weight in 2012, the percent unemployed, the percent of adults with less than a high school diploma/GED, the average life expectancy, the average number of deaths of children less than 1 year old, the racial composition of the neighborhood, and the percentage of households with an annual income of less than \$25,000.

GIS MAP

- Communities surrounding BRESKO already at-risk communities
 - The environmental concerns that BRESKO raises have the potential to compound that risk
 - **CUMULATIVE IMPACT**

The BRESKO Incinerator and Its Relationship to Environmental Justice



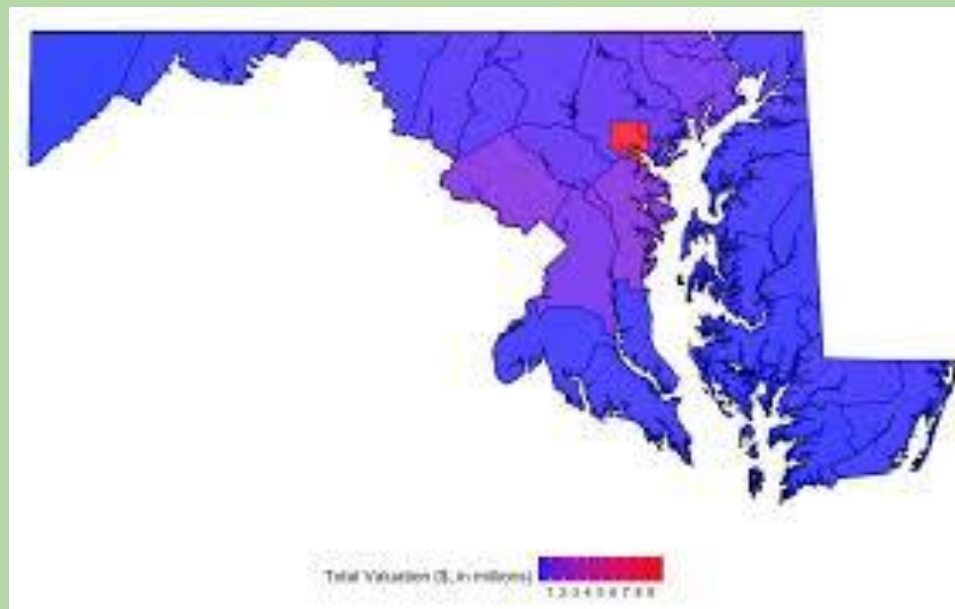
Environmental Justice Concern



This map illustrates the relationship between the BRESKO incinerator in Baltimore, MD and environmental justice. The level of environmental justice concern was found by using a weighted sum analysis of 7 variables measured across all the neighborhoods in Baltimore: the percentage of babies born of satisfactory weight in 2012, the percent unemployed, the percent of adults with less than a high school diploma/GED, the average life expectancy, the average number of deaths of children less than 1 year old, the racial composition of the neighborhood, and the percentage of households with an annual income of less than \$25,000.

Environmental Justice Issues (continued)

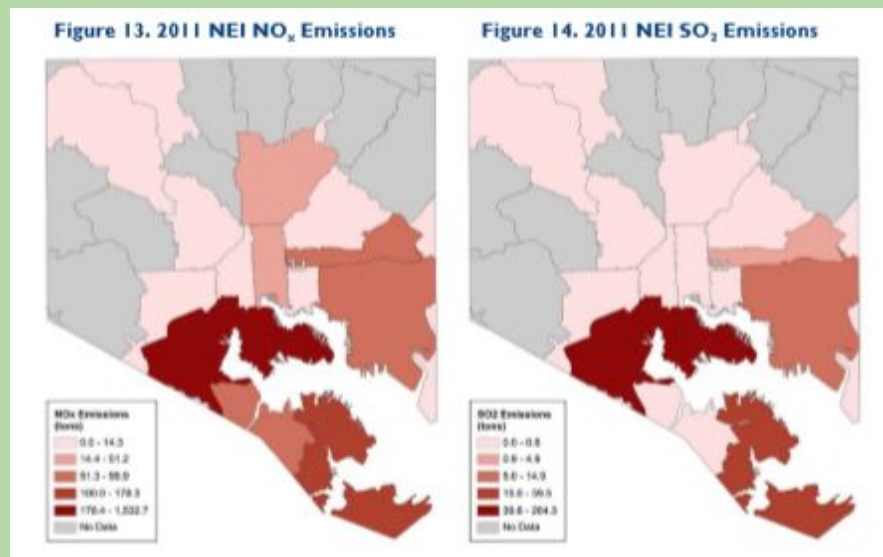
- **Thurston Report (2017):**
 - Commissioned by Chesapeake Bay Foundation
 - Researched and written by George D. Thurston, professor at NYU
- **Findings:**
 - Impacts of fine particulate matter (PM)
 - Linked to lung damage, increased risk of heart attacks, increased risk of mortality, etc.
 - Roughly half of BRESKO's impacts felt in downwind counties and states
 - Conservative estimate for health cost of BRESKO's emissions:
\$55 million/year



*Map of Maryland Health Impact Valuations in Dollars, by County

Environmental Justice Issues (continued)

- **Environmental Integrity Project report (2017):**
 - Baltimore's rate of asthma-related hospitalizations
 - 3x higher than US average
 - 2x higher than MD average
 - South Baltimore respiratory health
 - Highest asthma-related hospitalization rates in Baltimore
 - Greatest respiratory risk from toxic air pollution in Baltimore
 - These same South Baltimore Areas have the lowest median household income in Baltimore



*Maps of NO_x and SO_x Emissions in Baltimore in 2011

Other Decommissioned Incinerators

Location	Year	Reason for Closing
Jackson County, MI	2013	The Michigan Department of Corrections terminated its contract for purchasing the stream produced by the incinerator, which made operation of the incinerator no longer economically possible.
Charleston County, SC: Montenay Incinerator	2010	County Council voted to close incinerator when the contract was up for renewal after community organizing and a waste management consultant said it was feasible.
Biddeford, ME. Maine Energy Recovery Company Waste-to-Energy Incinerator	2012	State stopped buying energy produced by the incinerator for a premium, company wanted to move and town wanted revitalization so they bought incinerator.
Harford County, MD	2016	Leased land from the Army, they terminated contract for private deal.

Jackson County, MI

- Michigan Department of Corrections was only major energy customer
- Budget cuts for Department of Corrections -> loss of \$2.4 million annually for incinerator
- Running incinerator no longer economically possible



Charleston County, SC

- The incinerators contract was up for renewal, the County Council listened to public concern and brought in a consultant to develop long-term waste management plan
- Determined County could operate waste management system without incinerator
- Committed to increasing recycling rate to 40%



Biddeford, ME

- A lot of public unhappiness over being known as a “stink town”
- Private company (Cassella) had deal with State letting them sell electricity for double the wholesale rate, which was ending
- Cassella decided they no longer wanted to operate facility
- Sold for \$6.6 million, to be paid over 20 years
- City has experienced a lot of benefits (Curbside recycling, redevelopment, profits from cellular antennas)



Harford County, MD

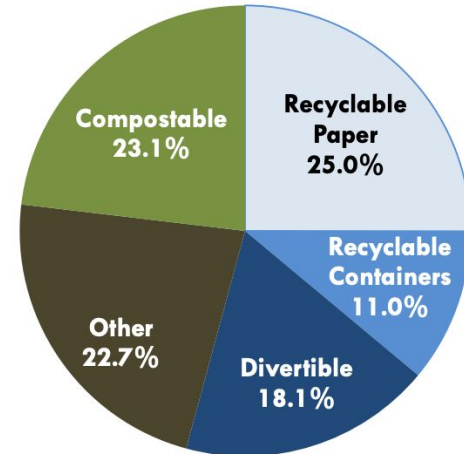
- Northeast Maryland Waste Disposal Authority leased the land from the federal government and sold energy to the U.S. Army
- Contract was up for renewal, and the Army decided to instead buy energy from a private natural gas company
- NMWDA decommissioned incinerator for \$311,538



Alternatives: Zero Waste

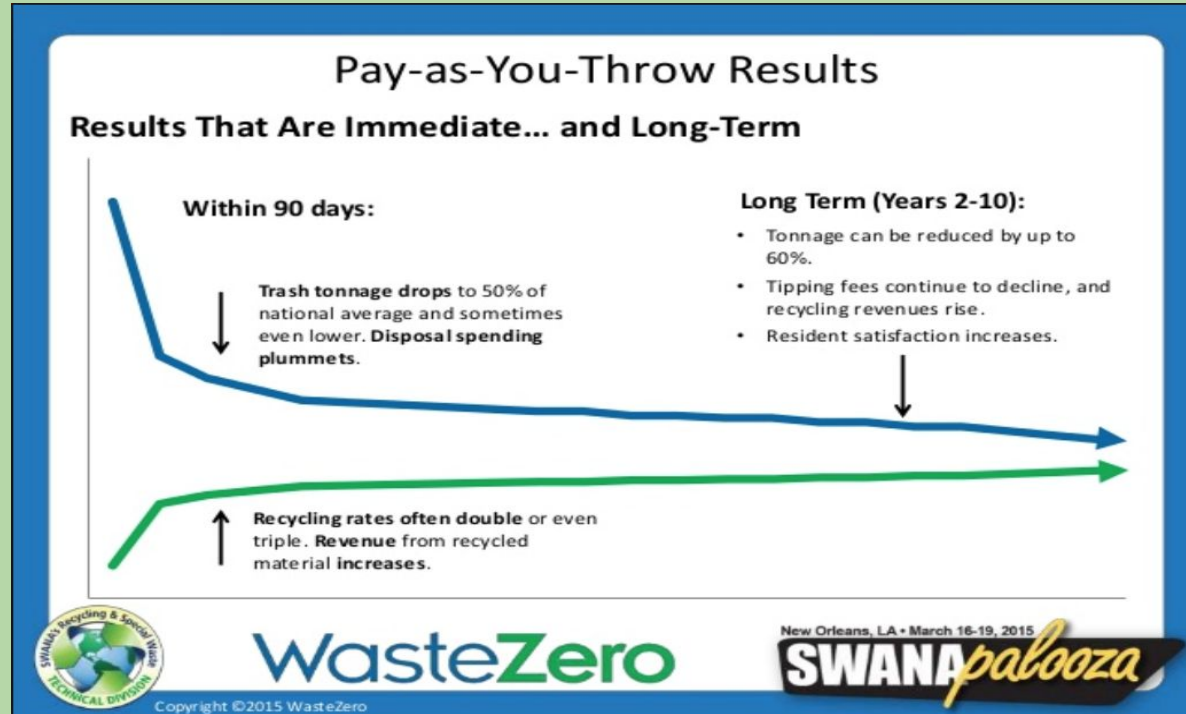


- **What is zero-waste?** A goal to reduce the need for disposal of solid waste as much as possible through a combination of sustainable practices such as:
 - **Environmentally Preferable Purchase** programs require employees to reduce waste by “purchasing products that are nontoxic, durable, repairable, long lasting, recyclable, compostable, energy efficient” .
 - **Extended Producer Responsibility:** Policies that incentivize or require producers and other entities to take responsibility for the products they produce in form of end-of-life responsibility.
 - **Mandatory diversion of food waste from commercial properties**
 - **Mandatory recycling in commercial sector**



Alternatives: Zero Waste

- In **pay-as-you-throw programs** (also known as unit pricing or variable-rate pricing), residents are charged for the collection of municipal solid waste based on the amount they throw away.
- The City of Charleston found that unit based pricing could divert more than **50%** of the waste stream, or roughly **30,000 tons of waste** per year, saving the City **\$1.2 million annually** in landfill costs (City of Charleston).



Example: Prince George's County

Zero Waste Initiatives for Prince George's County, Maryland



- Education on **source reduction**
- Initiatives that support **reuse** (identifying new materials, “repair cafes”, and databases)
- **Disposal Bans** (electronics, carpet, wood etc)

Alternatives: Recycling and Composting

- Increased national recycling average to 75% would result in a decrease in emissions of carbon dioxide by 515 million metric tons.
- 4.1 full time jobs per 10,000 tons of material composted
- 1.2 full time jobs per 10,000 tons of material incinerated



Conclusion/Recommendation

- **Opposition** of BRESCO contract renewal in 2021 based on:
 - Threat to public health and environmental wellbeing
 - Local and and large scale impacts
- Important to consider the following in the decommissioning process:
 - Impact on Baltimore City jobs
 - Alternative locations of waste disposal
 - Replacement of steam and electricity produced by BRESCO

Future Work and Areas for Future Study

We recommend that future research focus on:

- Based on the research into other decommissioned incinerators, we recommend focusing on making **operation of the incinerator no longer financially feasible** (removal from Renewable Portfolio Standard and/or losing contracts for the energy purchases)
- An **improved reuse and recycling plan** for jurisdictions that send waste to BRESKO (specifically Baltimore City and County), **alternative MSW solid waste disposal options**, alternative options to **replace BRESKO's electricity and steam production.**

Questions?

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