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
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 BRESCO: **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 BRESCO 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 BRESCO is recyclable/compostable.
Waste Histogram from 2017 BRESCO Recycling Report
Energy Generation and Output

Over 500,000 pounds of steam generated per hour

300,000 pounds of steam sent to the steam grid

powers over 50% of the steam grid

Steam, hot water, chilled water to approx. 255 customers

200,000 pounds of steam used to make electricity

Up to 60 megawatts per hour produced, 416,650 megawatt hours in 2016

Enough to power 40,000 homes

Enough to power 40,000 homes
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 CO$_2$ 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 NOx 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

- NOx emissions also contribute to **nitrogen deposition in the Chesapeake Bay**

- BRESCO is the **one of the highest emitters of NOx** in the state
  - Will need to reduce its emissions to comply with new EPA standards for ozone
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

<table>
<thead>
<tr>
<th>Year</th>
<th>NOx Tons</th>
<th>Long Term (Annual) Average NOx 24-Hr Block Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>1067</td>
<td>169 ppm</td>
</tr>
<tr>
<td>2014</td>
<td>1076</td>
<td>162 ppm</td>
</tr>
<tr>
<td>2015</td>
<td>1123</td>
<td>168 ppm</td>
</tr>
<tr>
<td>2016</td>
<td>1141</td>
<td>169 ppm</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>1102</strong></td>
<td><strong>167 ppm</strong></td>
</tr>
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BRESCO vs. MCRRF

- MCRRF: Montgomery County Resource Recovery Facility
- Incinerators roughly the same size
- BRESCO’s 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 **NOx**
  - 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 NOx
  - 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: www.lawandenvironment.com

Source: Chesapeake Bay Foundation
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”

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<th>BRESCO Ranking:</th>
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<tbody>
<tr>
<td></td>
<td>Baltimore</td>
<td>Statewide</td>
</tr>
<tr>
<td>Total Air Pollution</td>
<td>#1</td>
<td>#12</td>
</tr>
<tr>
<td>Mercury</td>
<td>#1</td>
<td>#4</td>
</tr>
<tr>
<td>Sulfur Dioxide (SO₂)</td>
<td>#1</td>
<td>#9</td>
</tr>
<tr>
<td>Nitrogen Oxides (NO₃)</td>
<td>#1</td>
<td>#11</td>
</tr>
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Composition of Maryland’s RPS

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

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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**
GIS MAP

- Communities surrounding BRESCO already at-risk communities
  - The environmental concerns that BRESCO raises have the potential to compound that risk
  - CUMULATIVE IMPACT
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 BRESCO’s impacts felt in downwind counties and states
  - Conservative estimate for health cost of BRESCO’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 NOx and SOx Emissions in Baltimore in 2011*
<table>
<thead>
<tr>
<th>Location</th>
<th>Year</th>
<th>Reason for Closing</th>
</tr>
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<tr>
<td>Jackson County, MI</td>
<td>2013</td>
<td>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.</td>
</tr>
<tr>
<td>Charleston County, SC: Montenay Incinerator</td>
<td>2010</td>
<td>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.</td>
</tr>
<tr>
<td>Biddeford, ME. Maine Energy Recovery Company Waste-to Energy Incinerator</td>
<td>2012</td>
<td>State stopped buying energy produced by the incinerator for a premium, company wanted to move and town wanted revitalization so they bought incinerator.</td>
</tr>
<tr>
<td>Harford County, MD</td>
<td>2016</td>
<td>Leased land from the Army, they terminated contract for private deal.</td>
</tr>
</tbody>
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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).
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 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 BRESCO (specifically Baltimore City and County), alternative MSW solid waste disposal options, alternative options to replace BRESCO’s electricity and steam production.
Questions?
References


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