# **Powering Today. Protecting Tomorrow.**

Bristol Open Meeting | July 2021



## Agenda

- Introduction & webinar procedures
- Overview of Covanta & Covanta Bristol
- Overview of biomedical waste
- Overview of Covanta Bristol permit application
- Environmental Performance
- Community Outreach
- Q&A



# World Leader in Waste-to-Energy

#### Waste:

Operate 41 Waste-to-Energy (WTE) facilities

**~21** million tons processed annually  $\rightarrow$  1:1 tons of CO<sub>2</sub> equivalent offset

**20** material processing facilities



#### Energy:

**~10** million MWh generated annually

1,700+ MW base load capacity

#### Covanta owns and/or operates 75% of the North American WtE market

### Metals:

**~600,000** gross tons of ferrous and non-ferrous recovered annually



## Sustainable Materials Management – US, EU and CT

The EPA and the EU have ranked the most environmentally sound strategies for municipal solid waste. Source reduction (including reuse) is the most preferred method, followed by recycling, energy recovery, and, lastly, treatment and disposal. Connecticut has a similar hierarchy and commitment to self sufficiency.





# Why Waste-to-Energy?

or



Landfill



Waste-to-Energy

- Landfills are a major source of man-made methane
- Methane is more than 30X more potent than Carbon Dioxide
- Leachate generation: ground water contamination
- Non sustainable use of land
- Energy generation from landfills:
   65 kWh per ton of waste

- 90% reduction of waste in volume
- Clean base load power generation
- Recovers metals for recycling
- Offsets on average one ton of carbon dioxide equivalent for each ton of waste processed
- Renewable energy generation from Waste-to-Energy:
   550 kWh per ton of waste





## Energy Recovery Comparison of Waste Management Options



*Source:* U.S. EPA (2016) Waste Reduction Model, Version 14 *Source:* U.S. EPA (2016) Waste Reduction Model, Version 14



## Lifecycle GHG Comparison: Major Electricity Sources



*Sources:* Sathaye *et al.* (2011) "Renewable Energy in the Context of Sustainable Development"; NREL Life Cycle Assessment Harmonization Results and Findings webpage, accessed 8/2015; U.S. EP, NC State University, RTI International (2014) MSW



## **Connecticut – Closer to EU Performance**





New facility in Copenhagen, Denmark



Spittelau Waste-to-Energy Facility, Vienna, Austria



# **Emissions Performance**



## "The performance of the MACT retrofits have been outstanding."

Pollutant	1990 Emissions (tpy)	2005 Emissions (tpy)	Percent Reduction	
CDD/CDF, TEQ basis*	4400	15	99+%	
Mercury	57	2.3	96%	
Cadmium	9.6	0.4	96%	
Lead	170	5.5	97%	
Particulate Matter	18,600	780	96%	
HC1	57,400	3,200	94%	
SO <sub>2</sub>	38,300	4,600	88%	
NO <sub>x</sub>	64,900	49,500	24%	





## We continue to improve our performance



Covanta Americas 2016-2018 EfW Emissions Compared to 2007



# 2017–2019 WTE Emissions Compared to Federal Standards

% BELOW FEDERAL STANDARD 37% 64% 78% 83% 83% 92% 96% 96% 95% Pb Cd Hg Dioxins PM HCI со SO2 NOx

The facility operates up to **96% below** federal emissions standards



## What comes out of the Stack?

#### 99.976% of the emissions are the constituents of air







## **Covanta Bristol**

- Began commercial operation in May 1988 with 2 large Municipal Waste Combustors
- Annual Capacity: 243,000 tons in two 358 ton per day water wall furnaces using Martin grates and ash handling systems
- These systems are equipped with air pollution control equipment and continuous emissions monitoring systems
- Produce 16 megawatts of electricity
- Permitted to receive waste 24/7
- 37 full time local employees at the facility



#### How Do Our Emissions Compare to Other Sources in the County? Local air emissions\* in Hartford County, CT



#### **Continuous Emission Monitoring Compliance**

In 2020, the facility was **99.98%** compliant with CEMS emissions standards



14

## Air Quality Review - Hartford County, CT







\* The annual state average provides a useful comparison to local air quality results. Determination of CT's compliance with standards is evaluated differently, using the State Design Values.

\*\* The 1971 NAAQS standard of 30 ppb (annual arithmetic mean  $SO_2$  concentration) as shown, was replaced in 2010. The new standard is defined as 75 ppb (99th percentile of 1-hour daily maximum). For clarity and consistency, the 1971 NAAQS standard was used.



## Air Quality Review - Hartford County, CT







useful comparison to local air quality results. Determination of CT's compliance with standards is evaluated differently. using the State Design Values.



# Air Quality Review - Hartford County, CT



Monitors in a **10-mile radius** from Covanta Bristol, Spanning Hartford, Litchfield, and New Haven counties

(+ 1 monitor 17.4 miles away to supplement SO2 and Ozone data)

#### Data Sources

USEPA Monitor Values Report: https://www.epa.gov/outdoor-air-qualitydata/monitor-values-report USEPA Air Data – Concentration Plot: https://www.epa.gov/outdoor-air-quality-data/airdata-concentration-plot



# Connecticut Emissions Performance compared to EU and U.S./Canadian New Facility Standards

Pollutant	2018 Annua Bristol	– 2020 I Average Southeast Connecticut	U.S. Federal Std. Existing Units <sup>b</sup>	U.S. Federal Std. New Units <sup>c</sup>	2000 European Union Directive (Dublin, IE) <sup>d</sup>	Durham- York, Canada (2015)	Units
NO <sub>x</sub>	128.4	136	205 <sup>e</sup>	150 <sup>e</sup>	137 <sup>f</sup>	90	ppmv
PM (F)	2.0	1.1	25	20	13 <sup>f,g</sup>	13	mg / m <sup>3</sup>
SO <sub>2</sub>	13.4	8.9	29	30	25 <sup>f</sup>	19	ppmv
нсі	5.0	3.1	29	25	8.6 <sup>f,g</sup>	8 <sup>g</sup>	ppmv
со	20.4	44.5	100	100	56 / 112 <sup>f,h</sup>	49	ppmv
Hg	1.0	0.3	50	50	65	21	μg / m³
Cd	2.4	0.6	35	10	65 <sup>i</sup>	10	μg / m³
Pb	18.8	12.3	400	140	654 <sup>j</sup>	69	μg / m³
PCDD/F (Total)	2.5	1.3	30	13	11 <sup>k</sup>	<b>7</b> <sup>k</sup>	ng / m <sup>3</sup>



# Connecticut Emissions Performance compared to EU and New Facility Standards – the footnotes!

- All figures referenced to 7% O2, dry basis at 68°F and 1 atm. European Union (EU) standards are specified under different conditions (11%O2, dry basis at 273 K, 101.3 kPa), but are shown here referenced to U.S. EPA conditions to allow for comparison.
- (F) = filterable; ppmv = parts per million by volume
- PCDD/F = polychlorinated dibenzodioxin and polychlorinated dibenzofuran, commonly referred to collectively as dioxins.
- U.S. Emission limits depicted do not reflect permit specific limitations, including Best Available Control Technology (BACT), which is a requirement for all new units, or Lowest Achievable Emission Rate (LAER), which would be required for those pollutants for which the proposed location is in a non-attainment area.
- a 2018 continuous emission monitor system (CEMS) and stack test results.
- b Emission guidelines for large municipal waste combustors constructed on or before September 20, 1994, 40 CFR §60, Subpart Cb. Guidelines shown are for mass burn waterwall units.
- c Standards of performance for large municipal waste combustors for which construction is commenced after September 20, 1994, 40 CFR §60, Subpart Eb.
- d Directive 2000/76/Ec Of The European Parliament And Of The Council of 4 December 2000 on the incineration of waste
- e NOx limits applied to specific plants can be lower based on the location of the plant relative to areas of ground level ozone non-attainment.
- f EU standards which rely on continuous emission monitoring systems to demonstrate compliance provide a margin to account for measurement variation. In contrast, the U.S. standards are a clearly defined limit, since measurement variation is taken into account in setting the limit.
- g Standard is 24-hour average, measured using continuous emission monitoring system (CEMS). U.S. standard compliance is determined through a 3 run average of shorter duration stack samples (1 hour for HCl, 3 hours for PM) using the appropriate EPA reference method. For a given numerical standard, those based on longer averaging periods are generally less stringent.
- h EU CO limits are 56 ppmv as a daily average and 112 ppmv as a 30-minute average. U.S. limits are a 4-hour average.
- i EU metals limits are based on a family with similar toxicity whereas EPA has individual metal specific values. Limit shown includes Cd and Tl.
- j EU metals limits are based on a family with similar toxicity whereas EPA has individual metal specific values. Limit shown includes Pb, as well as Sb, As, Cr, Co, Cu, Mn, Ni, and V.
- k EU and Ontario permit limits are expressed in terms of toxic equivalents (TEQs) and U.S. permit limits are in terms of total mass. This figure is an estimate based on a ratio of 85 ng total PCDD/F / 1 ng TEQ PCDD/F. The ratio is the average from 2012 Covanta stack test results. Individual facility ratios varied from 40 to 200. Differences in the ratio are driven by the differences in relative concentrations of the various PCDD/F congeners, which have varying degrees of toxicity.



## **Community Outreach & Environmental Justice Policy**



Policy announcement in Chester, PA on November 9th, 2011





## **Community Outreach & Environmental Justice Policy**



#### We are committed to...

Having open, two-way communication with communities on issues which may be of interest or concern to them...

Having an enhanced public participation strategy with communities on major facility permit actions and engage in substantive conversations with community members during the early stages of the permitting process.



# EJ for Covanta – not just words BUT ACTION!

- New Baghouses
  - Newark, NJ
  - Huntsville, AL
  - Hillsborough, FL
- New NOx Controls
  - Newark, NJ
  - Fairfax, VA (WIP)
  - Huntsville, AL
  - Alexandria, VA (WIP)
  - Stanislaus, CA (in planning)
- In Planning/Permitting
  - Camden, NJ Baghouse
  - Chester, PA NOx Reduction



Our 2019 Sustainability Goals include – "We've committed to implement five projects by 2023 to further reduce emissions in EJ communities. We will also set a science-based GHG reduction target by 2022 to drive further reductions."



# Community Affairs Major Programs – 2019

Standing National Program Results				
Totals	2019	Since Inception	Starting	
Mercury (lbs)	357.5	4,509.4	2009	
Rx4Safety (lbs)	1,429,720	7,844,726	2010	
Batteries (lbs)	1,777	25,312	2011	
E-Waste (lbs)	21,057	429,715	2011	
Fishing for Energy (lbs)	300,000+	4,000,000+	2008	
Tour Visitors	19,106	147,251	2012	

- Issued Community Outreach Plan Goals for 2017 and continue refinement with all facilities
  - Same requirements as 2016 (combination of mandatory and community specific activities)
- Developed requirements for non-WTE facilities
- Developed, issued and compiled survey results from WTE community stakeholders regarding effectiveness of outreach



# Answers to some frequently asked questions

- What is the anticipated volume of Biomedical Waste (BMW) that will be taken at the Covanta Bristol facility?
  - Consistent with the Facility's existing permits, the most BMW that could be received would be 57 tons on a
    weekly average but no more than 114 tons on any given day. The facility is not requesting additional waste
    tons than those already permitted.
- Will this waste stream have an impact on truck traffic to the plant?
  - We do not anticipate an increase in truck traffic as BMW waste loads would replace other commercial special waste loads currently permitted to be received.
  - Will the processing of BMW have an impact on our air emissions profile?
  - Due to the low amount of BMW being proposed (8% of the total waste), the fuel mix of BMW to MSW being fed to the boilers will not result in a noticeable change in the resulting emissions. This has been confirmed by stack testing at our other facilities.

#### • Is there reason for concern in processing waste that may contain pathogenic material?

• Our primary concerns are related to the safety of our workforce and the potential for exposure to the waste. The systems, related procedures and training programs that will be described in the permit application have been proven at three existing Covanta facilities and minimize risks via the use of automated equipment, personal protective equipment and "no-touch" procedures. After the waste is fed into our combustors, the very high temperatures and long residence time ensures that the pathogens are destroyed and pose no harm to the public.



# Benefits of Waste-to-Energy

#### Helping to enhance Connecticut's environmental capabilities



Environmentally sustainable waste management that **COMPLEMENTS** recycling.



Best solution after recycling – waste volume **REDUCED** by 90%



Generates **CLEAN AND RELIABLE** renewable energy



Baseload power 24 /7; located near demand centers



**COMBATS** climate change; **NET REDUCERS OF GREENHOUSE GASES**- 1:1 CO2 offset for each ton of waste processed



Recycling metal from WTE facilities avoids greenhouse gases and **RECOVERS VALUABLE NATURAL RESOURCES** that would have otherwise been lost in landfills.



## Covanta's Biomedical Waste (BMW) Program



#### BMW Program History:

- Over 33 years of experience processing BMW beginning at Marion, OR in 1988 and Huntsville, AL in 1990
- Moved to large scale BMW processing at Marion and Huntsville facilities in 2016 and Lake, FL facility which received a permit in 2018
- Substantial capital investment in site improvements and automated handling equipment to accommodate large scale processing
- Established a new standard for safety and efficiency in receiving and processing BMW
- Now provide the Heathcare sector with:
  - 1. much needed capacity for thermally treating BMW
  - 2. the most sustainable treatment technology for BMW (i.e.: renewable energy, metals recycling)



# Types of Acceptable Biomedical Waste





# Types of Unacceptable Biomedical Waste

The following types of BMW are not part of Covanta's permit application and will <u>not</u> be accepted in the BMW program:





### **Biomedical Waste Customers**





### How Covanta Processes Biomedical Waste

#### **Automated Hopper Feed System**

Proven standard operating procedures enhance protection of facility employees



Boxed biomedical waste is unloaded via forklift



Forklift loads boxed biomedical waste into system elevator



Containers are elevated to the charging deck level



Containers are automatically moved across to designated boiler and biomedical waste is tipped in



## Covanta Biomedical Waste

#### **Connecticut DEEP Solid Waste Application:**

- 2018-2020 Outreach and Information Meetings: state & local agencies, employees and the public to solicit feedback before application developed.
- CT DEEP regulations: Biomedical waste is a special waste which may be requested to be processed at CT Resource Recovery facilities such as Covanta Bristol.
- CT DEEP Application submitted March 2021:
  - Discusses the need for safe, sustainable medical waste disposal for CT Healthcare facilities.
  - Limited to 8% of facility's total waste (max 57 tons per day). Would replace other commercial special waste tons, not replace MSW tons. No change in truck volume, just different type of waste.
  - Covanta's well established biomedical waste program with vigorous QA/QC program in place.
  - State-of-the-art waste delivery systems minimizes employee handling of waste.
  - Covanta's established Combustion and Pollution Control technology destroys pathogens and ensures no increase in emissions.
- Application is currently being reviewed by CT DEEP. The application may be found on the Covanta Bristol facility page: <u>https://www.covanta.com/where-we-are/our-facilities/bristol</u>



# Air Emissions From Covanta Bristol Facility

The Bristol Facility operates well below its allowable emissions limits set by the USEPA and CTDEEP.

	Units	Permit Limits	Covanta Bristol 2011- 2020 Actual Results	% BELOW Limit
Particulate Matter	mg / dscm	25	3	88%
Dioxin/Furan	ng / dscm	30	2	95%
Mercury	µg / dscm	28	2	93%
Lead	µg / dscm	400	12	97%
Cadmium	µg / dscm	35	1	97%
NOx	ppm	120 / 150	138	8%
SO <sub>2</sub>	ppm	29	8	72%
СО	ppm	100	26	74%
HCI	ppm	29	6	79%



# Air Emissions From Covanta Lake Facility

The Lake County Facility operates well below its allowable emissions limits and the introduction of BMW has had a negligible effect on emissions

Pollutant	Limits (@ 7% O2)	2016-2018 3-yr Average (without BMW)	2019-2021 3-yr Average (with BMW)
Particulate Matter	25 mg/dscm	0.95	1.15
Cadmium	0.035 mg/dscm	0.0002	0.0003
Lead	0.4 mg/dscm	0.002	0.002
Mercury	0.05 mg/dscm	0.0019	0.0015
HCI	29 ppmdv	7.18	9.23
Dioxin/Furan	30 ng/dscm	2.39	1.40
СО	100 ppmdv	9	14
SO <sub>2</sub>	29 ppmdv	1.2	4.0
NOx	205 ppmdv	191	184



### **Community Outreach & Environmental Justice Policy**





## Comprehensive Outreach Annual Planning

Stakeholder	Activity	Description
City of Bristol BRRFOC	- Recurring meetings with Executive Director, City Mayor	Ongoing discussions with all 14 BRRFOC towns via Policy Board
	- Bristol Hazardous Waste Days	
CIDEEP	- CT DEEP Programming Support	\$5-\$7k in support of DEEP-organized events
EJ Groups	- Ongoing dialogue with Sharon Lewis and the CCEJ/Zero-Waste	Frequent presentations and discussions
	Coalition	
West Hartford	- Paper Shredding Event	\$15k Outreach Spend
Chamber of Commerce	<ul> <li>Bristol Chamber of Commerce Wellness Fair – Drug Takeback –</li> </ul>	Partnership with Bristol Police Department in conjunction with the Chamber to
	Bristol PD	support assured destruction of pharmaceuticals
	- Annual Chamber Dinner	Sponsor for the annual dinner
PDs and FDs	- Rx 4 Safety	Central CT Chamber, Bristol Health Fair
DEEP	- State Legislative Breakfast	Program sponsor
State and Federal	<ul> <li>Engagement with key legislators and councilpersons</li> </ul>	Government relations cadence and recurring dialogue
Local Resident	- Tours with employees	Tours to be scheduled
Local Media	- Press releases/public notices	Press releases for key community outreach
Community Members	- COVID-19 donation- \$2.5k	Local Food Pantry
	- Earth Day Tree Planting Event	
<b>Bristol Boys and Girls Club</b>	- Golf Outings – Boy & Girls	Donation to the BBGC through annual golf
	- Winter Clothing Drive	\$2k donation
	- Bristol Boys and Girls Club Family Center Sponsor	Funding to the BBGC Family Center
Local Businesses	- \$37K Mystic Aquarium display	Donation (\$150k total), every 3 years
		Installed Urban Gardens at various Bristol Housing Authority
Local Schools	- Town of Wolcott Scholarships	\$2k
Pequobuck Watershed	- Clean-ups	Sponsor/Participate in Pequabuck Rivershed Cleanup



# **Community Engagement: Key Highlights**



#### Bristol Chamber of Commerce

- Wellness Fair annual
- Partnership with Bristol Police Department in conjunction with the Chamber to support secure destruction of pharmaceuticals/drugs
- Hosted Hazardous Waste Day



#### **Take-Back Events**

- Partnered with town(s) law enforcement agencies, Take back day / Fed Authorities
- RX4Safety 4.67 tons 2020
- Sponsor/Participate in Pequabuck Rivershed Cleanup



Bristol Boys & Girls Club

- Golf Outing fund raiser
- Winter Clothing Drive (\$2k donated – equating to 150 clothing items)
- Family Center Sponsor
- Installed Urban gardens at Bristol Housing Authority



#### **Local Business**

- \$37K Mystic Aquarium display / donation. 150k every three years – 4 sites
- U.S. Flag Retirement Event
- Town of Wolcott Scholarship. 2 High School grad scholarships per year. 1k each



## Bristol Facility Local and Area Annual Contribution





## MSW Pricing and Revenue Share Benefits

#### **BRRFOC**

- Bristol Resource Recovery Facility Operating Committee – BRRFOC is 14 Core communities/business under contract until **2034.**
- Community outreach payments capped at \$93k per year prorated by towns and tons. Paid quarterly.
- Current tip fee is \$68.18 and escalating by CPI with a minimum of 1.75% and a max of 3.25% per year.
- Current municipal and spot market pricing is \$95.00 to \$100.00 per ton.
- The BRRFOC have low-cost / long term disposal options.

#### **BRRFOC Power Revenue Share**

- We share \$5.00 per MWH on 50% of our MWH produced.
- Revenue is shared with each of our 14 core communities prorated by the % of waste per community.

Actual		
2015	\$263,412	
2016	\$257,889	
2017	\$268,574	
2018	\$204,776	
2019	\$257,435	
2020	\$250,580	
Forecasted		
2021	\$240,523	
	\$1,743,189	

#### **City of Bristol Host Agreement**

- City of Bristol receives an annual host payment of \$30k per month average or \$335k per year and property taxes of \$1.3M per year.
- As required under new EJ policy CVA has entered into a Community Environmental Benefit agreement for our BMW program.
- Under the agreement the City of Bristol will receive a revenue share of \$30 per ton of BMW processed first year.





# Q&A



Please raise your hand or submit your questions in the Q&A function of the Webinar



You will be unmuted when the question is being answered



# Thank You



