



**Testimony of Ted Michaels
President, Energy Recovery Council
Before the Maryland Senate Finance Committee
February 25, 2020**

In opposition to House Bill 560, concerning Public Utilities - Renewable Energy Portfolio Standard - Tier 1 Sources

My name is Ted Michaels and I represent the Energy Recovery Council (ERC). On behalf of the ERC, I strongly oppose Senate Bill 560, which removes waste-to-energy from being an eligible Tier 1 resource. The elimination of waste-to-energy as a Tier 1 renewable source ignores the many benefits of WTE and adversely affects the continued viability of WTE as a renewable energy resource and solid waste disposal solution in the State of Maryland.

ERC represents those engaged in the waste-to-energy (WTE) industry, including municipalities that rely upon this important technology for safe, effective trash disposal and the generation of clean, renewable energy. ERC members that operate facilities in Maryland are Covanta Energy and Wheelabrator Technologies Inc. Maryland's two existing waste-to-energy facilities, located in the City of Baltimore and Montgomery County, generate 123 megawatts of electricity from the disposal of more than 4,050 tons of trash per day.

WTE is Locally-Generated Renewable Power

WTE is a clean, renewable, efficient, and economical form of energy production and post-recycled waste disposal that helps the U.S divert waste from landfills while producing renewable energy to reduce our reliance on fossil fuels to generate electricity. WTE belongs in Tier 1 of the renewable portfolio standard, as it has been since 2011.

Modern WTE facilities use proven technology to take every day post-recycled waste and convert it into clean, renewable energy through controlled combustion of mixed municipal solid waste in large power boilers. The resulting heat energy produces steam, which turns a turbine-generator to produce electricity. The process of converting waste into energy is a key part of an integrated materials management plan that focuses on waste reduction, reuse, recycling, and recovery of energy. The U.S. EPA has said that WTE facilities produce electricity "with less environmental impact than almost any other source of electricity" and "communities greatly benefit from dependable, sustainable capacity of municipal WTE plants."¹ A study of WTE technologies by the Joint Institute for Strategic Energy Analysis for the U.S. Department of Energy concluded

¹ US Environmental Protection Agency. Letter from Assistant Administrators Marianne Horinko, Office of Solid Waste and Emergency Response, and Jeffery Holmstead, Office of Air and Radiation to Integrated Waste Services Association (2003).

that WTE is a “refined, clean, well-managed application for energy production.”² WTE meets the two basic criteria for establishing what a renewable energy resource is—its fuel source (trash) is *sustainable* and *indigenous*. WTE facilities recover valuable energy from trash after efforts to “reduce, reuse, and recycle” have been implemented by households and local governments. WTE facilities generate clean renewable energy and deserve the same treatment as any other renewable energy resource under the RPS.

WTE has been recognized as renewable by the federal government for nearly thirty years under a variety of statutes, regulations, and policies, including the Public Utility Regulatory Policies Act of 1978; the Biomass Research and Development Act of 2000; the Federal Energy Policy Act of 2005; Executive Order 13423 of 2007; Executive Order 13514 of 2009; the Pacific Northwest Power Planning and Conservation Act; and Section 45 of the Internal Revenue Code.

Many other states have also recognized WTE as renewable. Thirty-one states, the District of Columbia, and two territories have defined WTE as renewable energy in various state statutes and regulations, including renewable portfolio standards. The renewable status has enabled WTE plants to sell credits in renewable energy trading markets, as well as to the federal government through competitive bidding processes, which helps sustain WTE as a viable solid waste disposal option for Maryland municipalities. In the case of publicly owned facilities, the sale of renewable energy credits creates revenue for local governments that own WTE facilities, helping to reduce a community’s cost of processing waste and promoting recycling.

WTE Generates Baseload Electricity with High Availability

WTE plants supply much needed base load renewable electricity to the nation’s power grid. WTE facilities operate 365 days a year, 24 hours a day and can operate under severe conditions. For example, WTE facilities have continued to operate during hurricanes. In the aftermath of the storms, they have provided clean, safe and reliable waste disposal and energy generation. WTE facilities operate at an average of greater than 90% availability, which is higher than many forms of energy production.³

WTE Reduces Greenhouse Gases

EPA scientists, in a prominent peer reviewed paper, concluded WTE facilities reduce GHG emissions relative to even those landfills equipped with energy recovery systems.⁴ In addition, many other governmental and nongovernmental organizations have formally recognized WTE for its role in reducing world-wide GHG emissions including the:

² Joint Institute for Strategic Energy Analysis. 2013. Waste Not, Want Not: Analyzing the Economic and Environmental Viability of Waste-to-Energy (WTE) Technology for Site-Specific Optimization of Renewable Energy Options. Technical Report NREL/TP-6A50-52829.

³ Energy Recovery Council. Waste Not, Want Not. www.wte.org/userfiles/file/Waste%20Not%20Want%20Not.pdf (last accessed 01.31.14)

⁴ Kaplan, P.O., J. DeCarolis, S. Thorneloe, Is It Better to Burn or Bury Waste for Clean Electricity Generation? *Environ. Sci. Technol.* 2009, 43, 1711-1717. <http://pubs.acs.org/doi/abs/10.1021/es802395e>

- Intergovernmental Panel on Climate Change (“IPCC”) called WTE a “key GHG mitigation technology”,⁵
- World Economic Forum (WEF) which identified WTE as one of eight renewable energy sources expected to make a significant contribution to a future low carbon energy system,⁶
- European Union,^{7,8}
- U.S. Conference of Mayors, which adopted a resolution in 2005 endorsing the U.S. Mayors Climate Protection Agreement, which identifies WTE as a clean, alternative energy source which can help reduce GHG emissions. As of today, 1,060 mayors have signed the agreement.
- Clean Development Mechanism of the Kyoto Protocol,⁹
- Voluntary carbon markets,¹⁰ and
- Center for American Progress, which promotes the use of WTE as an important waste management method that can decrease greenhouse gases by reducing emissions that would otherwise occur from landfills and fossil-fuel power plants.¹¹

WTE GHG reductions are quantified using a life cycle assessment (LCA) approach that includes GHG reductions from avoided methane emissions from landfills, WTE electrical generation that offsets or displaces fossil-fuel based electrical generation, and the recovery of metals for recycling. Life cycle emission analysis show that WTE facilities actually reduce the amount of greenhouse gases expressed as CO₂ equivalents (GHGs or CO₂e) in the atmosphere by approximately 1 ton for every ton of municipal solid waste (MSW) combusted.

New energy from waste capacity is eligible to generate carbon offsets based on a Clean Development Mechanism offset methodology through the Verified Carbon Standard (VCS). To date, two facilities in North America have progressed through the carbon offset generation process, successfully validating and verifying their projects in accordance with the standard. The Lee County, Florida facility began generating carbon offsets with the 2007 emissions year, and the Hillsborough County, Florida facility has verified carbon offsets beginning with the 2009

⁵ WTE identified as a “key mitigation measure” in IPCC, “Climate Change 2007: Synthesis Report. Contribution of Work Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change” [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp. Available at:

http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm

⁶ WTE identified as a key technology for a future low carbon energy system in World Economic Forum. *Green Investing: Towards a Clean Energy Infrastructure*. January 2009. Available at: <http://www.weforum.org/pdf/climate/Green.pdf>

⁷ EU policies promoting WTE as part of an integrated waste management strategy have been an overwhelming success, reducing GHG emissions over 72 million metric tonnes per year, see European Environment Agency, *Greenhouse gas emission trends and projections in Europe 2009: Tracking progress towards Kyoto targets*

http://www.eea.europa.eu/publications/eea_report_2009_9

⁸ European Environmental Agency (2008) Better management of municipal waste will reduce greenhouse gas emissions.

Available at: http://www.eea.europa.eu/publications/briefing_2008_1/EN_Briefing_01-2008.pdf

⁹ Clean Development Mechanism Executive Board: “Approved baseline and monitoring methodology AM0025: Avoided emissions from organic waste through alternative waste treatment processes.” Available at:

<http://www.cdm.unfccc.int/methodologies/DB/3STKBX3UY84WXOQWIO9W7J1B40FMD>

¹⁰ Verified Carbon Standard Project Database, <http://www.vcsprojectdatabase.org/> See Project ID 290, Lee County Waste to Energy Facility 2007 Capital Expansion Project VCU, and Project ID 1036 Hillsborough County Waste to Energy (WtE) Facility 2009 Capital Expansion Unit 4.

¹¹ Center for American Progress (2013) *Energy from Waste Can Help Curb Greenhouse Gas Emissions*

<http://www.americanprogress.org/wp-content/uploads/2013/04/EnergyFromWaste-PDF1.pdf>

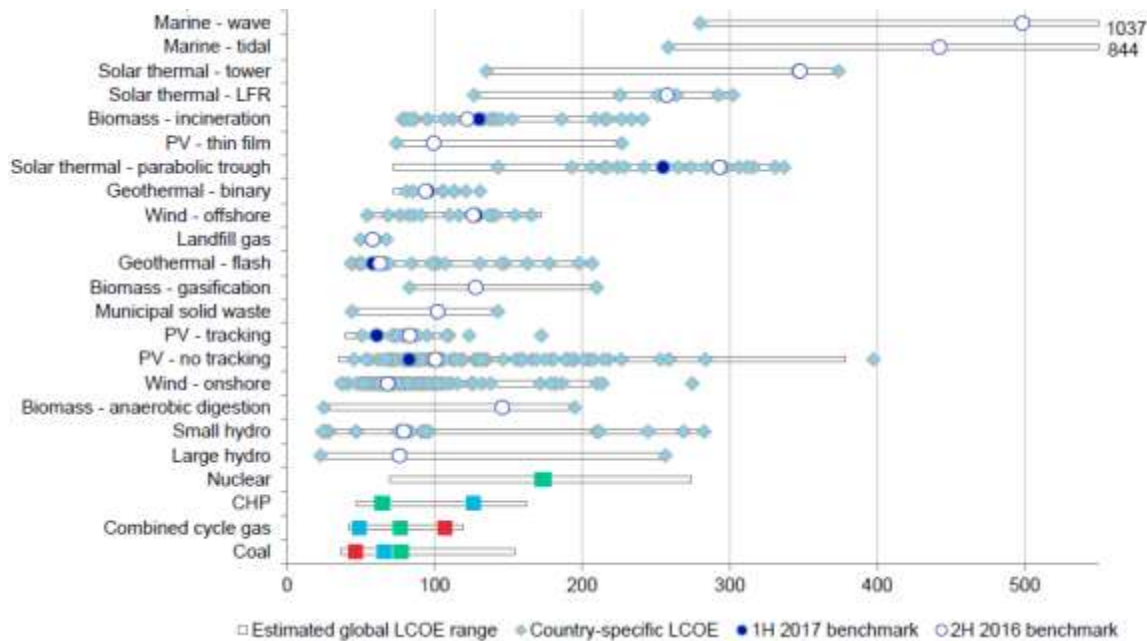
emissions year. The credits are associated with the avoidance of landfill methane and displaced grid-connected fossil fuel electricity generation.

WTE is a Cost-Competitive Source of Renewable Energy and GHG Reduction

The U.S. Department of Energy’s Energy Information Administration (EIA) uses Levelized Cost of Energy (LCOE) to measure the competitiveness of a particular energy resource. EIA defines LCOE as:

“Levelized cost is often cited as a convenient summary measure of the overall competitiveness of different generating technologies. Levelized cost represents the present value of the total cost of building and operating a generating plant over an assumed financial life and duty cycle, converted to equal annual payments and expressed in terms of real dollars to remove the impact of inflation. Levelized cost reflects overnight capital cost, fuel cost, fixed and variable O&M cost, financing costs, and an assumed utilization rate for each plant type.”

Global levelized costs of electricity, 1H 2017 (\$/MWh)



Source: Bloomberg New Energy Finance/Business Council for Sustainable Energy *Sustainable Energy in America 2018 Factbook*.

Based on EIA data, the average LCOE from a new WTE facility is approximately \$85 per megawatt hour, making it cheaper than or competitive with other sources of electricity. This figure is comparable to other recently published values for WTE’s levelized cost, including those in a recent peer-reviewed article by Duke University scientists (\$94 / MWh)¹² and a 2018 report

¹² Chadel, MK, G Kwok, LB Jackson, LF Pratson (2012), The Potential of waste-to-energy in reducing GHG emissions, *Carbon Management* (3)2, 133-144.

coauthored by Bloomberg and the Business Council for Sustainable Energy (\$48 - \$130 / MWh) (see figure above).¹³

WTE Provides Green Jobs and Boosts Local Economies

The revenues, employment, and labor earnings derived from managing waste, producing energy, and recycling metals are the direct economic benefits of WTE.¹⁴ In addition, these activities generate indirect impacts. Employees at WTE plants are technically skilled and are compensated at a relatively high average wage. As a result, WTE facilities provide stable, long-term, well-paying jobs, while simultaneously pumping dollars into local economies through the purchase of local goods and services and the payment of fees and taxes.

THE PROPOSED LEGISLATION LIMITS THE RENEWABLE MARKET AND HARMS MARYLAND CITIZENS BY:

- Arbitrarily advancing specific energy technologies above others, distorting clean energy markets;
- Removing the potential for existing and innovative renewable energy technologies to participate in the clean energy market;
- Reducing and eliminating overall support for Tier 1 renewable technologies that have created high-quality, diverse renewable energy jobs and contributed to greenhouse gas reductions in the state of Maryland;
- Curtailing diversification of renewable energy resources in Maryland's energy portfolio by favoring a few technologies that lack the reliability of WTE;
- Relying heavily on out-of-state generation to meet Maryland's RPS goals; and
- Threatening the continued operation of Maryland's existing waste-to-energy facilities, which avoid the environmental impact of landfilling in Maryland and expensive long-haul transporting of waste to other states.

For the reasons stated in this testimony, the Energy Recovery Council urges an unfavorable report on SB 560.

¹³ Global levelized cost range, estimated from figure 18 of Bloomberg New Energy Finance, Business Council for Sustainable Energy (2018), *Sustainable Energy in America Factbook*, <http://www.bcse.org/sustainableenergyfactbook.html>.

¹⁴ Berenyi, E. "Nationwide Economic Benefits of the Waste-to-Energy Sector." Governmental Advisory Associates, Inc. August, 2013.