1730 RHODE ISLAND AVENUE, NW
SUITE 700
WASHINGTON, DC 20036

WWW.ENERGYRECOVERYCOUNCIL.ORG

ENERGY RECOVERY COUNCIL

Testimony of Ted Michaels
President, Energy Recovery Council
Before the New York City Council
Committee on Sanitation and Solid Waste Management
October 26, 2011

Good afternoon. I am pleased for this opportunity to offer the perspective of the Energy Recovery Council (ERC) on waste-to-energy technologies. Waste-to-energy has been recognized around the world as an important tool in reducing greenhouse gas emissions and as a renewable source of electricity. New York City has great potential to maximize renewable energy resources and manage its trash in a responsible manner by utilizing waste-to-energy as an important tool in the solid waste hierarchy. ERC firmly believes that the New York City should consider waste-to-energy as a tool that will provide long-term waste management sustainability, reduce greenhouse gas emissions, and generate much needed baseload electric capacity at the point of consumption.

ERC represents companies and local governments engaged in the nation's waste-to-energy sector. Waste-to-energy facilities produce clean, renewable energy through the combustion of municipal solid waste in specially designed power plants equipped with the most modern pollution control equipment to clean emissions. Trash volume is reduced by 90% and the remaining residue is safely reused or disposed in landfills. There are 86 waste-to-energy plants operating in 24 states managing about 7 percent of America's trash, or about 90,000 tons each day. The nation's waste-to-energy plants have a baseload electric generation capacity of more than 2,700 megawatts to meet the power needs of more than two million homes while serving the trash disposal needs of more than 36 million people. There are 10 waste-to-energy facilities operating in the State of New York alone, turning more than 12,000 tons of trash per day into much needed renewable energy.

Waste-to-Energy is Renewable Energy

Since the inception of the commercial waste-to-energy industry more than three decades ago, policymakers have recognized municipal solid waste as a renewable fuel. The most recent statutory recognition came in the American Recovery and Reinvestment Act of 2009. In addition, twenty-four states, the District of Columbia, Puerto Rico, and the Northern Marianna Islands define waste-to-energy as renewable.

Furthermore, New York State has long recognized waste as a renewable energy source – by including landfill-gas-to-energy (LFGTE) in the RPS – and, importantly, including a significant amount of existing energy from municipal solid waste in the calculation of the baseline of existing renewable capacity[1]. Under New York State Energy Law, waste-to-energy is defined as a renewable energy resource.[2] Similarly, the Commission's January

[1] http://www.dps.state.ny.us/rps/RPS_Baseline_Rev_3-18-03.PDF
[2] See § 1-103(12) of the New York Energy Law

2010 RPS Order recognized waste-to-energy as a predictable, base load generator that offers the "potential to unlock the hedging potential of renewable resources."[3]

Municipal solid waste is both sustainable and indigenous—two basic criteria for establishing what is a renewable energy source. Waste-to-energy facilities use this renewable fuel to generate clean electricity while also providing safe and reliable disposal of municipal solid waste. The sustainable nature of municipal solid waste is a major component of its historic renewable status. For more than three and a half decades, despite all of the efforts of EPA and many others to reduce, reuse and recycle, the U.S. diversion rate of municipal solid waste has climbed to barely 30%. During this same time period, the solid waste generation rate has more than *doubled* and the population has risen by more than 96 million people. Furthermore, for the past several years, the national average diversion rate has increased by less than one percentage point per year. Today, Americans dispose of more than 400 million tons of municipal solid waste per year of which less than 30 million tons is used as fuel in waste-to-energy facilities. It is clear to see that for the foreseeable future, there will be no end to an amount of municipal solid waste available as a renewable fuel.

In addition, section 203 of The Energy Policy Act of 2005 requires federal agencies to purchase 7.5 percent of their electricity from renewable sources by 2013. The applicable definition of renewable energy includes municipal solid waste, which is the fuel used by waste-to-energy plants. Section 203 is consistent with many state programs and a long history of federal laws defining renewable. In addition, President Obama's Executive Order 13514 authorizes federal agencies to purchase electricity from waste-to-energy in order to meet its federal renewable mandates.

Even in locations with mature state-of-the-art waste management programs, there is a significant amount of MSW remaining after reduction efforts, reuse and recycling. This waste can serve as a long-term supply of fuel in waste-to-energy facilities. A prominent example in New York State is Onondaga County. Onondaga County's waste-to-energy facility processes the waste remaining after achieving a 51% MSW recycling rate, the second highest county recycling rate in the state. In 2010, the facility was awarded the AF&PA Top Paper Recycling Community Award.

Waste-to-Energy is Clean Energy

Today's waste-to-energy facilities are sophisticated power plants that use MSW to generate energy. The Clean Air Act Amendments of 1990 required municipal waste combustors to establish and achieve Maximum Achievable Control Technology (MACT) standards. Municipal waste combustor units processing more than 250 tons per day were required to meet the new standards by 2000 and units processing less than 250 tons per day were required to meet MACT standards by 2005. These standards are among the most stringent in the United States. Companies and local governments have invested more than a billion dollars over the years to retrofit waste-to-energy plants and install the most modern emissions control equipment.

[3] See January 2010 RPS Order at 12.

As a result of these investments, and after review of compliance data, the United States Environmental Protection Agency (EPA) in 2003 said that waste-to-energy facilities produce "electricity with less environmental impact than almost any other source of electricity." (Holmstead and Horinko, 2003) In 2007, a memo from EPA's Office of Air and Radiation showed that waste-to-energy achieved significant and remarkable reductions in criteria pollutants (Stevenson, 2007).

Emissions control equipment play a major factor in the environmental performance of waste-to-energy facilities. However, there are several other factors that contribute to the superior emissions of waste-to-energy facilities today. Improvements in combustion engineering have helped limit the formation of pollutants in the boiler and facilities are always striving to achieve better performance than exists today. Estimated emissions from new units are expected to be even lower than the emission levels achieved by current facilities. For example, the recently permitted West Palm Beach (FL) waste-to-energy facility represents current Best Available Control Technology (BACT) and will achieve significant reductions from the permit requirements for existing facilities.

Scientific studies show that modern waste-to-energy facilities that are operated in accordance with state and federal regulations are safe. Human population studies indicate that modern waste-to-energy facilities do not adversely affect the health of communities in which they are located. In addition, risk assessments have been conducted for specific facilities to calculate the likelihood of adverse impacts from emissions. These risk assessments show that waste-to-energy facility emissions are well within, or lower than, the guidelines set by the U.S. EPA and state environmental agencies for protection of public health. Studies have also been conducted to determine whether measurable impacts to the environment occur in areas surrounding waste-to-energy facilities. Overall, the conclusions of these studies have found that modern waste-to-energy facilities are not associated with adverse impacts to either public health or the environment.

Waste-to-Energy Generates Much Needed Baseload Power

It is important to consider that waste-to-energy plants supply power 365-days-a-year, 24-hours a day and can operate under severe conditions. For example, Florida's waste-to-energy facilities have continued operation during hurricanes, and in the aftermath of the storm provide clean, safe and reliable disposal and energy generation. Waste-to-energy facilities average greater than 90% availability of installed capacity. The facilities generally operate in or near an urban area, easing transmission to the customer. Waste-to-energy power is sold as "baseload" electricity to utilities that can rely upon its supply of electricity. There is a constant need for trash disposal, and an equally constant, steady, and reliable energy generation. Baseload capacity will become even more important as new intermittent sources of electricity are brought online, such as wind and solar. Wind energy, for example, only produces electricity a fraction of the day, and generally during periods when the electricity is not in peak demand. In addition, wind power is difficult so site in densely populated areas and frequently encounters opposition in the communities in which the turbines will be sited.

Waste-to-Energy Reduces Greenhouse Gas Emissions

Waste-to-energy achieves the reduction of greenhouse gas emission through three separate

mechanisms: 1) by generating electrical power or steam, waste-to-energy avoids carbon dioxide (CO_2) emissions from fossil fuel- based electrical generation; 2) the waste-to-energy combustion process effectively avoids all potential methane emissions from landfills, thereby avoiding any potential release of methane in the future; and 3) the recovery of ferrous and nonferrous metals from municipal solid waste by waste-to-energy is more energy efficient than production from raw materials. These three mechanisms provide a true accounting of the greenhouse gas emission reduction potential of waste-to-energy. A life-cycle analysis, such as the U.S. Environmental Protection Agency's Municipal Solid Waste Decision Support Tool, is the most accurate method for understanding and quantifying the complete accounting of any waste management option. A life-cycle approach should be used to allow decision makers to weigh and compare all greenhouse gas impacts associated with various activities and management options.

The Decision Support Tool is a peer-reviewed tool[4] that enables the user to directly compare the energy and environmental consequences of various management options for a specific or general situation. Technical papers authored by EPA[5] report on the use of the Decision Support Tool to study municipal solid waste management options.

These studies used a life-cycle analysis to determine the environmental and energy impacts for various combinations of recycling, landfilling, and waste-to-energy. The results of the studies show that waste-to-energy yielded the best results—maximum energy with the least environmental impact (emissions of greenhouse gas, nitrogen oxide, fine particulate precursors, etc.). In brief, waste-to-energy has been demonstrated to be the best waste management option for both energy and environmental parameters and specifically for greenhouse gas emissions.

When the Decision Support Tool is applied to the nationwide scope of waste-to-energy facilities that are processing 28 million tons of trash, it has been shown that the waste-to-energy industry prevents the release of approximately 28 million tons of carbon dioxide equivalents that would have been released into the atmosphere if waste-to-energy was not employed. This level of performance is far superior to coal fired facilities and all other fossil fuel sources when evaluated on a life cycle basis.

Domestic Recognition

The ability of waste-to-energy to reduce greenhouse gas emissions has been embraced domestically. The Nature Conservancy (TNC) has an August 2011 feature on their website which helps explain how and why trash should help solve our energy problems. Joe Fargione, lead scientist with the TNC's North America Region said, "There is no silver bullet for solving the problem of producing renewable energy, but waste-to-energy can be an important part of the solution. Waste from energy is not only renewable, it avoids putting the waste into landfills that produce methane gas, a greenhouse gas 23 times more potent than carbon dioxide. Therefore, waste-to-energy provides significant greenhouse gas emission reduction benefits." (http://www.nature.org/ourscience/sciencefeatures/ask-the-conservationist-august-2011.xml).

[4] Available through US EPA and its contractor RTI International.

[5] *"Moving From Solid Waste Disposal to Management in the United States," Thorneloe (EPA) and Weitz (RTI) October, 2005, and "Application of the U.S. Decision Support Tool for Materials and Waste Management," Thorneloe (EPA), Weitz (RTI), Jambeck (UNH), 2006*

This is a widely recognized position.

The U.S. Conference of Mayors adopted a resolution in 2004 recognizing the greenhouse gas reduction benefits of waste-to-energy. In addition, the U.S. Mayors Climate Protection Agreement supports a 7 percent reduction in greenhouse gases from 1990 levels by 2012. The Agreement recognizes waste-to-energy technology as a means to achieve that goal. As of the date of this letter, 1,054 mayors have signed the agreement.

The Global Roundtable on Climate Change (GROCC), convened by Columbia University's Earth Institute, issued a statement on February 20, 2007 identifying waste-to-energy as a means to reduce CO_2 emissions from the electric generating sector and methane emissions from landfills. The GROCC, which brought together high-level, critical stakeholders from all regions of the world, recognized the importance of waste-to-energy's role in reducing greenhouse gas emissions. The breadth of support for the GROCC position is evidenced by those that have signed the joint statement, including Dr. James Hansen of the NASA Goddard Institute for Space Studies, as well as entities as diverse as American Electric Power and Environmental Defense.

The Lee County (FL) waste-to-energy facility has been certified by the Voluntary Carbon Standard to generate carbon offsets which can be sold to those entities wishing to acquire carbon credits. The credits are based on electricity generated by the new capacity added by a recent expansion of its waste-to-energy facility. By emitting less greenhouse gases than its alternatives, the county has banked more than 80,000 carbon credits. Lee County's waste-to-energy plant is the first in the nation to sell its own carbon credits on the voluntary market. The money generated by these credits will go to offset garbage collection fees.

International Recognition

The ability of waste-to-energy to prevent greenhouse gas emissions on a life-cycle basis and mitigate climate change has been recognized in the actions taken by foreign nations trying to comply with Kyoto targets.

The Intergovernmental Panel on Climate Change (IPCC), the Nobel Prize winning independent panel of scientific and technical experts, has recognized waste-to-energy as a key greenhouse gas emission mitigation technology.

The World Economic Forum in its 2009 report, "Green Investing: Towards a Clean Energy Infrastructure," identifies waste-to-energy as one of eight technologies likely to make a meaningful contribution to a future low-carbon energy system.

In the European Union, waste-to-energy facilities are not required to have a permit or credits for emissions of CO_2, because of their greenhouse gas mitigation potential. In the 2005 report, "Waste Sector's Contribution to Climate Protection", the German Ministry of the Environment stated that "...waste incineration plants and co-incineration display the greatest potential for reducing emissions of greenhouse gases." The report concluded that the use of waste combustion with energy recovery coupled with the reduction in landfilling of biodegradable waste will assist the European Union-15 in meeting its obligations under the Kyoto Protocol. In a 2008 briefing, the European Environment Agency attributes reductions in waste management

greenhouse gas emissions to waste-to-energy.

Under the Kyoto Protocol, by displacing fossil fuel-fired electricity generation and eliminating methane production from landfills, waste-to-energy plants can generate tradable credits (Certified Emission Reductions [CERs[6]]) through approved Clean Development Mechanism protocols. These CERs are accepted as a compliance tool in the European Union Emissions Trading Scheme.

In summary, waste-to-energy is recognized as a greenhouse gas mitigation technology that is eligible for offsets through independent approved protocols. Treatment of waste-to-energy as a source of greenhouse gas emissions would be inconsistent with internationally accepted science and accounting procedures. Just as importantly, it would put the United States at a disadvantage in meeting CO_2 reduction targets because an important tool used by other countries would not be available domestically.

Waste-to-energy is Compatible with Recycling

Statistics compiled for nearly two decades have proven that waste-to-energy and recycling are compatible despite many attempts by naysayers to conclude otherwise. Since research on the subject began in 1992, communities that rely upon waste-to-energy maintain, on average, a higher recycling rate than the national EPA average.

Communities that employ integrated waste management systems usually have higher recycling rates and the use of waste-to-energy in that integrated system plays a key role. There are several factors why the recycling rates of communities with waste-to-energy facilities would be higher than those without. First, communities with waste-to-energy plants tend to be more knowledgeable and forward thinking about recycling and MSW management in general. Second, communities with waste-to-energy plants have more opportunities to recycle since they handle the MSW stream more. Third, the municipal recycling program can be combined with on-site materials recovery at the waste-to-energy plant (e.g. metals recovered at a waste-to-energy plant post-combustion usually cannot be recycled curbside and would otherwise have been buried had that trash been landfilled).

In a paper entitled, "A Compatibility Study: Recycling and Waste-to-Energy Work in Concert, 2009 Update," Eileen Berenyi with Governmental Advisory Associate, Inc. researched the recycling characteristics surrounding 82 waste-to-energy facilities in 22 states. Recycling data was obtained from 567 local governments, as well as statewide data from the 22 states covered in the report. In 2009, the report shows that communities with waste-to-energy have an average recycling rate of 33.2%. The national average for recycling as estimated by EPA is estimated at 32.5%, while BioCycle/Columbia University estimate it to be 28.6 %. However, Berenyi has calculated an "adjusted" recycling rate for EPA that more closely tracks the recycling rates calculated by others. (Berenyi, 2009)

The unadjusted U.S. EPA computed national recycling rate (32.5%) is computed using a waste stream model and includes certain commercial/industrial components and yard waste. These

[6] CDM protocol (AM0025 v7) and associated memorandum, "Avoided emissions from organic waste through alternative waste treatment processes."

materials are often excluded in individual state and local recycling tonnages. In order to juxtapose comparable statistics, it is appropriate to use Berenyi's adjusted EPA rate of 27.8%. Regardless of what factor you use, communities with waste-to-energy outperform communities without waste-to-energy when it comes to recycling. If you compare the rate to BioCycle or the Berenyi adjusted EPA rate, it is a difference of approximately five percentage points. This is borne out by the recycling rates of European countries as it relates to their reliance upon waste-to-energy or landfilling. The most progressive countries recycle a lot, recover energy as much as possible, and landfill little. Less advanced countries landfill as much as possible, recycle and combust almost nothing.

While recycling is an important waste management option, nationally over 50 percent of the waste stream was still diverted to landfills in 2007[7]. Waste-to-energy capacity has remained constant over the years, highlighting the fact that when recycling rates fall, landfilling rates increase. Waste-to-energy, however, works in tandem with strong recycling efforts. Waste-to-energy facilities prefer a feedstock source that provides a more consistent BTU rate. Items such as plastics significantly increase the calorific value of MSW, slowing down the facility's throughput. A stream that limits or does not include these items, allows for more efficient business production. The recycling of high BTU items is, consequently, preferable for waste-to-energy operations.

The actual content of non-recycled MSW changes due to many variables. Nationally approximately 65 percent of the combustible portion of MSW comprises biomass materials[8], such as post-recycled paper, wood, and food scraps. This is based on extensive stack testing at waste-to-energy facilities that use sophisticated radiocarbon dating techniques specified by the U.S. EPA for its greenhouse gas reporting program.[9] The remaining 35 percent is composed of plastic, synthetic textiles, and other materials containing fossil-based carbon.

Waste-to-Energy Emphasizes Health and Safety

Waste-to-energy facilities, like all other workplaces, must meet these tough standards put in place by the U.S. Occupational Safety and Health Administration (OSHA). The waste-to-energy industry takes tremendous pride in its health and safety programs and often goes beyond what is required by law. Great importance is placed on developing and implementing successful programs that protect the people working in the plants.

OSHA has recognized the stellar accomplishments of 51 waste-to-energy facilities in the United States with the designation of STAR status under the Voluntary Protection Program (VPP). VPP STAR status is the highest honor given to worksites with comprehensive, successful safety and health management systems. STAR sites are committed to effective employee protection beyond the requirements of federal standards and participants develop and implement systems to effectively identify, evaluate, prevent, and control occupational hazards to prevent injuries and illnesses. The keys to health and safety success under VPP are the employee engagement and

[7] www.gcsusa.com/energymsw.htm
[8] B. Bahor, M. Van Brunt, K. Weitz, A. Szurgot, (2010), "Life Cycle Assessment of Waste Management Greenhouse Gas Emissions Using Municipal Waste Combustor Data" J. Envir. Engrg. 136: 8, 749-755. http://dx.doi.org/10.1061/(ASCE)EE.1943-7870.0000189
[9] 40 CFR §98.34(d)

ongoing involvement in on-site health and safety program development combined with long-term commitment and support from management. Facilities that achieve STAR status routinely incur injury and illness rates that are at or below the state average for their specific industry.

Impressively, 51 of the 86 waste-to-energy facilities in the United States have earned VPP STAR status. While only a small fraction of one percent of all worksites in the United States is enrolled in VPP, more than 59% of U.S. waste-to-energy facilities have achieved STAR status. This illustrates the commitment of this sector to health and safety.

Maryland Elevates Waste-to-Energy in its RPS

On May 19, 2011, Maryland Governor Martin O'Malley signed into law legislation that makes waste-to-energy a Tier 1 renewable energy resource under the state's renewable portfolio standard. This legislation creates opportunities for waste-to-energy to provide Marylanders with reliable and sustainable waste management options, while generating clean, renewable electricity. The legislation will provide necessary incentives to promote waste-to-energy in the state. It also paves the way for waste-to-energy to contribute much needed baseload power to the state's renewable portfolio, and aligns Maryland with what the most environmentally progressive European nations are doing.

In a statement, Governor O'Malley recognized that his state needed to rely on a diverse fuel mix if it will achieve its future energy goals. He also acknowledged that despite the state's best efforts to recycle, "Marylanders generate tons of solid waste each and every day. If there is no waste-to-energy facility available, these tons of trash are simply dumped into landfills, no value is derived from the waste, and our State continues to rely on coal-fired generation to account for 55% of our energy needs."

This new law became effective this month. Waste-to-energy facilities in Maryland can now sell Tier 1 renewable energy credits on their robust renewable market. Their decision to boost the incentive for waste-to-energy sends a strong signal that waste-to-energy can provide the energy, environmental, greenhouse gas, and economic benefits that are valued and in demand.

Conclusion

ERC strongly believes that New York City can benefit greatly from utilization of waste-to-energy. Adoption of waste-to-energy will allow the City to manage its waste in a sustainable fashion while promoting an energy source that is clean, reliable, abundant, and reducing our carbon footprint. Energy is too scarce, waste is too abundant, and jobs are too precious to ignore the benefits of waste-to-energy.