STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of the Application of:	)	
	)	
COVANTA ENERGY CORPORATION	)	Case 03-E-0188
	)	
For Modification of the List of Eligible Resources Included in the Main Tier of New York's Renewable Portfolio Standard Program to Include Energy From Waste (EfW) Technology	)	

VERIFIED PETITION OF COVANTA ENERGY CORPORATION REQUESTING INCLUSION OF ENERGY FROM WASTE (EfW) AS AN ELIGIBLE TECHNOLOGY IN THE MAIN TIER OF NEW YORK'S RENEWABLE PORTFOLIO STANDARD PROGRAM

February 11, 2011

Doreen Unis Saia, Esq.
William A. Hurst, Esq.
Greenberg Traurig, LLP
54 State Street, 6th Floor
Albany, New York 12207
Tel.: (518) 689-1400
Fax: (518) 689-1499

Attorneys for Covanta Energy Corporation

TABLE OF CONTENTS

Page

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of the Application of:	)	
COVANTA ENERGY CORPORATION	)	Case 03-E-0188
For Modification of the List of Eligible Resources Included in the New York Main Tier Renewable Portfolio Standard Program to Include Energy From Waste (EfW) Technology	)	

VERIFIED PETITION OF COVANTA ENERGY CORPORATION REQUESTING INCLUSION OF ENERGY FROM WASTE (EfW) AS AN ELIGIBLE TECHNOLOGY IN THE MAIN TIER OF NEW YORK'S RENEWABLE PORTFOLIO STANDARD PROGRAM

PRELIMINARY STATEMENT

Covanta Energy Corporation ("Covanta"), a subsidiary of Covanta Holding Corporation, hereby submits this Verified Petition seeking the inclusion of Energy-from-Waste ("EfW") as a technology that is eligible to participate in the Main Tier of the New York Public Service Commission's ("Commission") Renewable Portfolio Standard ("RPS") program.[1]

1 See, e.g., Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, "Order Regarding Retail Renewable Portfolio Standard" (dated September 24, 2004) ("Initial RPS Order"); Case 03-E-0188, supra, "Order Approving Implementation Plan, Adopting Clarifications, and Modifying Environmental Disclosure Program" (dated April 14, 2005) ("Initial RPS Implementation Order"); Case 03-E-0188, supra, "Order Establishing New RPS Goal and Resolving Main Tier Issues" (dated January 8, 2010) ("January 2010 RPS Order"); Case 03-E-0188, supra, "Order Resolving Main Tier Issues" (dated April 2, 2010) ("April 2010 RPS Order"); Case 03-E-0188, supra, "Order Authorizing Additional Main Tier Solicitation and Setting Future Solicitation Guidelines" (dated December 3, 2010) ("December 2010 RPS Order").

EXECUTIVE SUMMARY

1. Energy from Waste ("EfW")[2] is a critical infrastructure component of advanced nations worldwide. In addition to being a state-of-the-art approach to solid waste management that is compatible with aggressive recycling efforts and open-space preservation, EfW provides reliable, base load energy generation close to load centers, significant greenhouse gas reductions and important fuel diversity.

- **EfW Produces Net Carbon Reductions**: EfW is the only form of electricity generation that actually reduces greenhouse gas ("GHG") in the environment as it produces electricity. EfW is recognized internationally as a GHG mitigation technology. In fact, the Nobel Prize winning Intergovernmental Panel on Climate Change ("IPCC") identifies EfW as a key GHG mitigation technology for the waste sector.[3] The World Economic Forum's reports of 2009-2010 identify EfW as a key technology for a future low carbon energy system.[4] EU policies promoting EfW as part of an integrated waste management strategy have been an overwhelming success, reducing GHG emissions by over 72 million metric tons per year.[5] EfW facilities,

---

2 EfW is also sometimes referred to as Waste-to-Energy ("WTE").

3 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. A copy of this report is annexed hereto as Exhibit 1.

4 World Economic Forum, *Green Investing: Towards a Clean Energy Infrastructure*, January 2009. A copy of this report is annexed hereto as Exhibit 2.

5 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).

both in the U.S. and abroad, generate and trade GHG credits under Kyoto's Clean Development Mechanism and the Voluntary Carbon Standard ("VCS").[6] China has established both an RPS and feed-in tariff for EfW.

- **EfW Outperforms Landfill Gas to Energy ("LFGTE") Relative to GHG Emissions and Energy Generation**: For every ton of waste processed using EfW in New York State, existing EfW facilities reduce approximately 0.8 tons of carbon dioxide equivalent emissions[7] and generate the equivalent of approximately 540 kilowatt hours ("kWh") of renewable electricity per ton (including steam generation).[8] A new EfW facility would do even better: reducing GHG emissions by one ton for every ton of waste processed and generating up to 750 kWh/ton[9] -- up to 14 times as much energy per

---

6 Clean Development Mechanism Executive Board: "Approved baseline and monitoring methodology AM0025: Avoided emissions from organic waste through alternative waste treatment processes." A copy of this report is annexed hereto as Exhibit 3.

7 Calculation based on New York State specific inputs (i.e., displaced grid GHG intensity, landfill gas collection practices in place at landfills managing New York waste) to the model set forth in B. Bahor, M. Van Brunt, K. Weitz, A. Szurgot, "Life Cycle Assessment of Waste Management Greenhouse Gas Emissions Using Municipal Waste Combustor Data," J. Envir. Engrg. 136:8, 749-755 (2010). Accessible at: http://dx.doi.org/10.1061/(ASCE)EE.1943-7870.0000189. Displaced grid GHG intensity factor average of USEPA eGRID non-base load emission factors for NYCW, NYLI, and NYUP subregions. The Emissions & Generation Resource Integrated Database for 2007 (eGRID 2007) Version 1.1, Year 2005 Summary Tables. December 2008. (http://www.epa.gov/cleanenergy/ebnergy-resources/egrid/index.html).

8 Based on 2009 Covanta operating data. Net electrical equivalent of steam calculated using conversion of 0.85 MWh electricity for every ten thousand pounds of steam exported.

9 New facility electrical generation of 750 kWh/ton based on Covanta design information for current facility proposals.

ton of waste when compared to LFGTE,[10] a technology previously given eligibility status in New York's RPS program. By including LFGTE as an eligible technology under New York's RPS program, the Commission previously has recognized MSW as an eligible feedstock, although LFGTE is far less efficient at converting MSW into electrical energy, and is a known source of GHG emissions.

- **EfW is Fully Compatible with Aggressive Local Recycling Efforts**: As recently noted by the New York State Department of Environmental Conservation ("NYSDEC") in its report on the current state of New York's solid waste management and planning efforts titled, *Beyond Waste*: *A Sustainable Materials Management Strategy for New York*, New York communities with EfW facilities generally have higher-than-average recycling rates. For example, Onondaga County (which hosts one of Covanta's seven (7) EfW facilities in New York) exhibits one of the State's highest recycling rates (51%) while the statewide average recycling rate has stagnated around 20%.[11]

- **EfW Emissions are Comprehensively Monitored and Highly-Regulated**: Due to the implementation of the federal Clean Air Act's MACT standards over the past two decades, most emissions from EfW

---

10 See Kaplan, Ozge P., et al., "Is it Better to Burn or Bury Waste for Clean Electricity Generation?", Environ. Sci. Technol., 1711-1717 (2009). A copy of this report is annexed hereto as Exhibit 4.

11 Dimino, R., *Beyond Waste: A Sustainable Materials Management Strategy for New York*, New York State Department of Environmental Conservation (2010) (hereinafter, "*Beyond Waste*") at 189. A copy of this report is annexed hereto as Exhibit 5.

have been reduced by 88% to 99%.[12] Covanta's EfW facilities in New York routinely operate well below their permit limits, with all emissions (except NOx) being at least 55% below the permitted emission limits, with some, such as mercury, metals and dioxins, being at least 80% below New York's stringent emissions limits.

- **EfW Creates Jobs**: Even assuming a future state of affairs in which New York triples its recycling rate to 60%, new state-of-the-art EfW facilities could still generate 2.3 million base load MWh/year[13] (enough for nearly 200,000 homes),[14] reduce GHG emissions by 3 million tons CO_2, and create approximately 660 jobs.[15] Construction of these facilities would generate nearly 5,000 new direct and indirect construction jobs for three years and provide over $6 billion in economic impact.[16] In contrast, independent reference documents used in assessing the performance of the RPS program identified that LFGTE would create a total of only 167 jobs over a 25 year period for

---

12 United States Environmental Protection Agency, 2007, Letter to Large MWC Docket (EPA-HQ-OAR-2005-0117). A copy of this EPA letter is annexed hereto as Exhibit 6.

13 The current New York State MSW recycling rate is approximately 20% (see *Beyond Waste* at 19). A 60% recycling and 10% landfilling rate applied to New York's estimated MSW generation of 18.3 million tons of MSW (id., at 93) would yield roughly 3 million tons of MSW for energy recovery, beyond that which is already processed in New York's facilities.

14 An average United States household consumes 11,500 kWh/year. See U.S. Energy Information Administration, 2005 Residential Energy Consumption Survey: Household Energy Consumption and Expenditures Table, Table US3. (http://www.eia.doe.gov/emeu/recs/).

15 Covanta Energy Corp., 2009, "Re-birth of the United States Energy-from-Waste Industry: Summary of Environmental, Energy Security and Economic Benefits." A copy of this report is annexed hereto as Exhibit 7.

an average of 6 jobs (both direct and indirect) per year for the entire state of New York with the majority (105) being indirect jobs.[17]

- **Mercury Emissions from EfW Are Comparable to LFGTE and Wood Waste-to-Energy, Both RPS-Eligible Sources:** The combination of changes in waste composition and more sophisticated and effective capture and disposal methods have reduced mercury emissions from EfW facilities in the United States by 96% between 1990-2005.

2. These significant opportunities and benefits will likely be lost to New York if EfW is not deemed eligible under New York's RPS program. Despite its strong benefits in terms of net GHG reductions, job creation, and base load domestic energy production close to load centers, EfW today receives less subsidy and support on a per MWh basis than other renewable energy sources (and even coal). As a result, EfW is not able to compete with these sources. EfW should be an approved source of renewable energy in the RPS program to enable the noted benefits to become a reality in New York State.

I. EfW SHOULD BE DEEMED AN RPS-ELIGIBLE MAIN TIER RESOURCE.

A. Covanta Energy Corporation.

3. Covanta currently operates seven (7) of the ten (10) EfW facilities that are geographically dispersed across the State of New York.[18] In general, EfW utilizes MSW as a

---

16 Id.

17 KEMA Inc. New York Main Tier RPS Impact & Process Evaluation. Table 35, Page 7-4. March 2009.

18 Specifically, Covanta operates EfW facilities in the following New York counties: Onondaga (1), Niagara (1), Dutchess (1), Nassau (1) and Suffolk (3).

fuel to generate electricity and/or steam, thereby avoiding the need to combust fossil fuels to produce electricity. Unlike other technologies participating in the RPS program, New York's EfW facilities operate on a base load basis. And by processing nearly 4 million tons of MSW annually, New York's EfW facilities generate the equivalent of over two million megawatt-hours ("MWh") of electricity (enough for 187,000 homes) and avoid 3.2 million tons of GHG emissions as carbon dioxide equivalent each year.[19]

B. The RPS Proceeding.

4. Established by the Commission in 2004, the RPS program is New York's primary policy initiative to promote the development of renewable energy resources. Similar RPS programs now exist in 33 states plus the District of Columbia. Of those, 18 states, including the surrounding states of Connecticut, New Jersey, Massachusetts and Pennsylvania, recognize EfW as an eligible RPS technology.[20] EfW is defined as renewable in 25 states -- including New York -- and in numerous statutes and policies, including the American Recovery and Reinvestment Act of 2009, the Energy Policy Act of 2005, the Federal Power Act, and the Federal GHG Accounting and Reporting Guidance.[21]

---

19 See footnote 15, supra.

20 Pew Center on Global Climate Change, Renewable & Alternative Energy Portfolio Standards, last accessed 1/6/2011. (http://www.pewclimate.org/what_s_being_done/in_the_states/rps.cfm).

21 White House Council on Environmental Quality, 2010, *Federal GHG Accounting and Reporting Guidance.* (http://www.whitehouse.gov/administration/eop/ceq/sustainability/fed-ghg). Additionally, under § 1-103(12) of the N.Y. Energy Law, EfW is defined as a renewable energy resource. Similarly, the Commission's January 2010 RPS Order recognized EfW as a predictable, base load generator that offers the "potential to unlock the hedging potential of renewable resources." See January 2010 RPS Order at 12. Indeed, New York State has long recognized waste as a renewable energy source – by including LFGTE in the RPS and, importantly, including a significant amount of existing EfW in the calculation of the baseline of existing renewable capacity.

5. The nearly 13 million tons of waste landfilled, both in and out of state,[22] represents a tremendous renewable energy resource. MSW is an indigenous and renewable source of energy which can help to reduce our reliance on foreign fossil fuels and even foreign biomass fuels. A recent consensus policy statement authored by eleven Berkeley, Dartmouth, MIT, Princeton, and University of Minnesota scientists published in the journal *Science* identified MSW as a biofuel done right: it is identified as one of just five key sustainable alternative fuel feedstocks with significantly lower life-cycle GHG emissions than fossil fuels.[23] Similarly, in evaluating options for a low carbon fuel standard, the Northeast States Center for a Clean Air Future (NESCCAF) identified that "waste is by far the region's most significant resource" for the production of advanced biofuels or electricity generation.[24] The European Union, USEPA and NYSDEC have identified MSW as a valuable energy generation resource which is managed in accordance with regulations protective of human health and the environment. Yet, while this is being accomplished in New York on a daily basis with ~ 3 million tons of MSW being managed at existing EfW facilities, over 13 million tons of non-recycled MSW is still being managed in landfills, in direct contradiction of recognized sustainable practices.

6. The Commission initiated the RPS proceeding in 2003, responding to the 2002 State Energy Plan, which warned of, inter alia, the potential national security and environmental consequences of New York's fossil fuel dependency:

---

22 See *Beyond Waste* at 178.

23 Tilman, D., et al., "Beneficial Biofuels - the Food, Energy, and Environment Trilemma," *Science*, v325, July 17, 2009.

24 Northeast States Center for a Clean Air Future, "Introducing a Low Carbon Fuel Standard in the Northeast: Technical and Policy Considerations," July 2009.

> We are increasingly concerned with the effects on our climate of fossil-fired generation and the security implications of importing [from out of state] much of the fuel needed to supply our electricity needs.
>
> Further, inasmuch as there is a finite supply of natural gas and other fossil fuels, over-dependence on such will leave the State vulnerable to price spikes and possible supply disruptions.[25]

7. Subsequent Commission orders in this proceeding acknowledge "the value of having a diversified energy mix without heavy reliance on one particular fuel source."[26] EfW, which relies on MSW as its feedstock, offers just that kind of fuel source diversity. Indeed, with so many of the RPS awards assigned to wind generating facilities, EfW would provide an important source of fuel diversity within New York's RPS program itself.[27] In addition, in contrast to many of the other RPS-eligible technologies, electricity generated by EfW is not intermittent -- it is a reliable, base load power source. Thus EfW provides both fuel diversity and a more consistent and predictable source of electricity to the grid, close to load centers, thereby reducing the need for additional transmission capacity.

8. The potential magnitude of the diversification to New York's renewable generation is significant. Even if New York's recycling rate tripled, EfW could provide the State with 2.3 million base load MWh/year (enough for 200,000 homes). In addition to providing base load power, EfW would reduce GHG emissions by 3 million tons of CO_2, and create almost 6,000 construction and permanent jobs.

---

25 Case 03-E-0188, supra, "Order Instituting Proceeding" (issued February 19, 2003) at 1.

26 See January 2010 RPS Order at 12.

27 This fact is reflected in the Mid-Course Report issued by Commission Staff on October 26, 2009, which shows that the 28 RPS contracts then held by NYSERDA are expected to contribute up to 2,947,000 MWh per year to the RPS Main Tier Target. Of that amount, fully 2,625,237 MWh is from wind generation. See Case No. 03-E-0188 "The Renewable Portfolio Standard: Mid-Course Report" at 14 (dated October 26, 2009).

9. In order to realize its potential, EfW needs support. According to the Energy Information Administration Office, most forms of energy generation – both fossil and renewable – receive subsidies and support at some level. For example, on a dollars/MWh basis, EfW receives $0.13, while Landfill Gas To Energy receives $1.37, wind receives $23.37, and solar receives $25.34. Even coal receives more support than EfW, at $0.44 per MWh. The FYI 2007 Subsidy and Support for various energy sources (in terms of million 2007 dollars) is $1 for EfW, $8 for LFGTE, $724 for Wind, $14 for Solar and $854 for Coal (Figure 1). While the potential exists for additional renewable energy generation from the EfW sector, the opportunity is tenuous without inclusion as an RPS eligible technology, especially in light of the comparatively low levels of existing financial support for the technology.

Figure 1. Subsidies and Support to Electricity Production[28]

Fuel/End Use	FY 2007 Net Generation (billion kilowatthours)	Alternative Measures of Subsidy and Support	
		FY 2007 Subsidy and Support (million 2007 dollars)	Subsidy and Support per Unit of Production (dollars/megawatthour)
Coal	1,946	854	0.44
Refined Coal	72	2,156	29.81
Natural Gas and Petroleum Liquids	919	227	0.25
Nuclear	794	1,267	1.59
Biomass (and biofuels)	40	36	0.89
Geothermal	15	14	0.92
Hydroelectric	258	174	0.67
Solar	1	14	24.34
Wind	31	724	23.37
Landfill Gas	6	8	1.37
Municipal Solid Waste	9	1	0.13
Unallocated Renewables	NM	37	NM
Renewables (subtotal)	360	1,008	2.80
Transmission and Distribution	NM	1,235	NM
Total	4,091	6,747	1.65

NOTES: Unallocated renewables include projects funded under Clean Renewable Energy Bonds and the Renewable Energy Production Incentive.

NM=Not meaningful. Totals may not equal sum of components due to independent rounding.

10. Additionally, EfW requires far less land than other renewable technologies and does not need new transmission infrastructure. A typical EfW facility requires an average of .7 acres per MW of electricity. By comparison, solar requires 8 acres per MW, wind requires 18 acres per MW and landfill gas to energy requires 27 acres per MW.[29] Thus, EfW is also compatible with open space preservation efforts.

---

28 Energy Information Administration Office of Coal, Nuclear, Electric, and Alternate Fuels, 2008, "Federal Financial Interventions and Subsidies in Energy Markets," 2007, Washington, D.C.

29 NYSERDA, 2005, Wind Power Project Site Identification and Land Use Requirements: (http://www.powernaturally.org/programs.wind/toolkit/13_windpowerproject.pdf); National Renewable Energy Laboratory PV Area Calculator. (http//www.nrel.gov/analysis/power_databook/calc_pv.php). LFGTE density calculated assuming a net electrical generation of 84 kWh/ton and 91% capacity factor, a 30-year duration of landfill electrical generation, waste density of 0.65 tons/yd^3, and landfill height of 100 feet; EfW energy density calculated from average Covanta facility size of 25 acres and electrical capacity of 36 MW.

11. As initially adopted, the Commission established a statewide objective for the RPS program of having 25% of New York State's energy consumption derived from renewable resources by the year 2013.[30] The bulk of the attributes necessary to achieve that goal are obtained under a central procurement model, which relies on competitive procurements of eligible Main Tier renewable resources by NYSERDA as the program administrator (the "Main Tier").

12. Acknowledging that new technologies were under development, and that existing technologies continued to be refined, and thus should have the opportunity to participate in the RPS program when appropriate, the Initial RPS Order directed DPS Staff to, "establish a mechanism to consider and add appropriate resources to the eligibility list,"[31] and to submit, by March 31, 2005, a proposed implementation plan for the RPS program. Among other matters addressed in the implementation plan DPS Staff so submitted were proposed rules, subsequently adopted by the Commission, concerning "a process to establish the eligibility of additional resources not currently eligible for participation in the RPS Program."[32]

13. In 2009, DPS Staff issued its Mid-Course Report, which recommended that the original RPS MWh goal for renewable resources be increased from 25% to 30% of New York's projected total MWh load and extended the term for attaining that goal until 2015. In the

---

30 See Initial RPS Order at 12. The Commission also established a complementary program for "behind-the-meter" applications of renewable generation (the "Customer-Sited Tier"). Id. at 51-52.

31 Id. at 40.

32 See Initial RPS Implementation Order at 3.

January 2010 RPS Order, the Commission, *inter alia*, adopted DPS Staff's recommended 30% goal by 2015.[33]

14. In the Initial RPS Implementation Order, the Commission concluded that "a public process is appropriate for consideration of new technologies and resources for RPS program support or for moving a technology or resource from the Main Tier to the Customer-Sited Tier."[34] Thus, the Commission directed that parties seeking to achieve eligibility status for new or improved technologies, such as Covanta, "should seek appropriate relief from the Commission, in compliance with our filing requirements."[35] The Initial RPS Implementation Order then set forth the criteria to be applied to any such Petition. In addition, in Appendix A of the Initial RPS Implementation Order, the Commission explicitly adopted a "Process for Determining Eligibility of Additional Resources or to Move a Resource from One Tier to Another," which established the applicable criteria, addressed in detail below, to be used by the Commission when making eligibility determinations under the RPS.[36]

---

33 See January 2010 RPS Order at 10. For the first time in the January 2010 RPS Order, the Commission translated the percentage milestone to a specific kWh value, setting the target at 10.4 million MWh by 2015. Id. at 13-14.

34 See Initial RPS Implementation Order at 35.

35 Id.

36 Id. and Appendix A. The RPS Implementation Plan (Appendix A) states that "the criteria for evaluating whether an additional or modified resource should be eligible to receive RPS Program support in either the Main Tier or the Customer-Sited Tier will consist of:

- the origin and composition of the generation fuel;
- the extent to which the resource will result in new and incremental renewable energy;
- the nature of the process transforming that fuel into electricity;
- the totality of the environmental and other impacts of the generation process, such as air emissions and waste products;

15. Pursuant to the Commission orders in this proceeding, applications to obtain eligibility for new or modified technologies to be included on the list of RPS-eligible resources are to be considered on a rolling basis, thus allowing the program to take into account new technologies as they develop, or, as is the case here, technological changes to existing technologies which cause them to be suitable for recognition under RPS. Indeed, recognizing the challenges presented by the aggressive 30% renewables goal,[37] the Commission's December 2010 RPS Order re-affirmed the Commission's "intent[] to establish an RPS process that is not only flexible and sustainable but also able to attract the most MWhs of renewable resources at the lowest reasonable cost to the public."[38]

16. EfW offers diversity and growth in New York's renewable generation that is attainable with strong environmental performance and with efficiencies that exceed some existing RPS eligible sources. As demonstrated in subsequent sections of this document, the "state-of-the-art" for EfW technology unquestionably has advanced in terms of emissions profile and conversion efficiency. Furthermore, climate change and GHG emissions, important areas in which EfW offers substantial and internationally well recognized benefits, have become a major policy focus both internationally and in New York and other states. Recognizing EfW as an RPS-eligible technology -- one which uses otherwise discarded materials that have not been reused or recycled as a fuel source to generate electricity on a base load basis using a highly-efficient, closely controlled process -- unquestionably helps the State meet its twin Regional

---

- the degree of development of the resource; and
- the probable cost of providing RPS Program support for that resource."

37 See, e.g., January 2010 RPS Order (Curry, dissenting) at 3.

38 See December 2010 RPS Order at 14.

Greenhouse Gas Initiative ("RGGI") and RPS program goals of reducing GHG emissions and increasing renewable generation. Thus, the Commission should grant Covanta's petition to include the EfW as a technology that is eligible to participate in the Main Tier RPS program.[39]

C. Origin and Composition of Generation Fuel.

17. The NYSDEC's 1987 Solid Waste Management Plan established a goal of reducing, reusing or recycling 50% of the State's waste stream in ten years, and established a solid waste hierarchy, codified into law in 1988, that placed priority on waste prevention, reuse and recycling, followed by EfW - exactly as proposed here - and, finally, landfilling as the lowest priority.[40] Accordingly, current law expresses a preference for EfW facilities over landfills for the management of solid waste that cannot be reused or recycled, or which is present in such small quantities that recycling is not economical.[41]

18. Two decades after publication of NYSDEC's Solid Waste Management Plan, New York State continues to landfill 12.7 million tons of waste, 6.7 million tons of which is being disposed of in New York landfills, while another 6 million tons is being exported for

---

39 As to SEQRA review, a Short Form Environmental Assessment ("SEAF") is submitted herewith. Notably, none of the prior Orders authorizing the RPS program identified additional SEQRA review as a prerequisite in the context of modifying the list of eligible resources, and no technology subsequently deemed eligible to participate in, or added to, the RPS program has ever been required to conduct any enhanced SEQRA review. The reason seems clear -- even assuming that such a modification to the eligibility rules qualifies as a SEQRA "action," a finding of eligibility would have virtually no environmental impact for existing EfW facilities. To the extent that a determination of WTE eligibility might incentivize new construction, the environmental impacts of that construction would be taken into account by the lead and involved agencies on a site-specific basis. Indeed, in the Commission's recent order approving the use of clean wood separated from C&D debris at an approved processing facility for use as biomass fuel in the RPS program, the Commission concluded that the action was "within the overall action previously examined by us and will not result in any different environmental impact than that previously examined." See Case 09-E-0843, Case 03-E-0188, supra "Order Approving Petition with Modifications" (dated November 22, 2010) at 19. The same analysis should pertain here.

40 See *Beyond Waste* at 3.

41 N.Y. EVTL. CONSER. LAW § 27-0106 (McKinney 2007).

disposal out-of-state.[42] Indeed, the NYSDEC acknowledges that "[T]wenty-two years later, the majority of the materials generated are managed by the lowest priority strategy, and the state is still striving to achieve its recycling goals."[43] Waste reduction and recycling are laudable goals and are properly encouraged, yet, in reality, statewide recycling rates have been stagnant or increased only slightly in recent years, even for the materials traditionally considered recyclable - steel, aluminum and PET plastic containers.[44] Should the State achieve higher recycling rates, such as that achieved in Onondaga County, there would continue to be significant quantities of MSW generated in New York requiring disposal. According to the statutory hierarchy and the statewide goals of reducing GHG emissions and increasing generation of renewable energy, the non-recycled MSW should be processed for energy recovery using modern technologies, not placed in landfills.

19. MSW represents a tremendous energy resource, the use of which for the production of energy is *expressly contemplated* by the state's solid waste hierarchy. MSW is an indigenous source of energy which can help to reduce our reliance on foreign fuels. The use of EfW for energy production would help to meet the following goals of the NYSDEC Solid Waste Plan:

- minimize waste disposal
- create green jobs
- maximize the energy value of materials management
- minimize the climate impacts of materials management
- reemphasize the importance of comprehensive local materials management planning

---

42 See *Beyond Waste* at 178.

43 Id. at 19.

44 Id.

- minimize the need for export of residual waste [45]

20. Since the early development of EfW, improved combustion design and operational practices, air pollution control equipment, more stringent environmental regulations, as well as changes in waste composition, have resulted in significant reductions in emissions. For example, the use of mercury in the United States decreased from more than 2,500 tons per year in 1970, to less than 400 tons per year by the end of the Twentieth Century.[46] As a result, there is simply less overall mercury in consumer products disposed of as MSW than in previous decades. Covanta consistently supports legislative efforts to remove even more mercury from the waste stream, and also supports improved consumer electronic waste disposal methods to remove mercury and other metals from the waste stream. The net effect of these efforts is a cleaner source of renewable power. In fact, in a 2003 letter, the U.S. EPA stated that EfW facilities generate electricity "with less environmental impact than almost any other source of electricity."[47]

21. While some have claimed that EfW facilities frustrate recycling efforts, usually based on a perception that the high BTU value of plastics is beneficial to the EfW process, the opposite is true. In fact, the throughput of waste at an EfW facility is constrained by the heating value of the trash and the amount of steam which can be generated. MSW containing significant amounts of high BTU recyclable materials results in the release of elevated amounts of energy

---

45 See *Beyond Waste* at 27.

46 United States Environmental Protection Agency, 1997, Mercury Study Report to Congress Vol. II: An Inventory of Anthropogenic Mercury Emissions in the United States. (http://www.epa.gov/ttn/oarpg/t3/reports.volume2.pdf).

47 U.S. EPA, 2003, Letter to Maria Zannes, Integrated Waste Services Association (now Energy Recovery Council). A copy of this letter is annexed hereto as Exhibit 8.

that would require a reduction in the overall waste feed rate in order not to exceed the heat input capacity of the boiler. Facility economics are more influenced by plant throughput of waste than power revenues. High BTU feedstock results in a need to reduce plant throughput, thus negatively impacting power generation and, by extension, the revenues generated thereby. Put simply, there is no financial incentive for EfW facilities to utilize high BTU fuels such as otherwise recyclable plastics or paper.

22. Recent data confirms the fallacy of any alleged incompatibility between EfW and recycling. Indeed, whereas average recycling and reuse levels have stagnated statewide, available data demonstrates that the New York communities which currently host EfW facilities have increased these practices.[48] Specifically, in New York, where the average recycling rate for MSW is 20%, Onondaga County recycles 51%, the Town of Islip recycles 40%, the Town of Hempstead recycles 40%, and the Town of Babylon recycles 32%,[49] *i.e.*, all well in excess of the statewide average, coupled with the presence of fully functioning EfW facilities. At the same time, these communities have converted substantial amounts of the remaining MSW which is not recycled or reused into valuable base load renewable electrical energy with resulting in net GHG emissions reductions, rather than directing it to landfills, oftentimes out-of-state, with the associated management and transportation impacts and methane emissions caused thereby.

---

48 See *Beyond Waste* at 189. See also Citizen's Campaign for the Environment, "Long Island Recycling Report Card," (dated September 2009) A copy of the Report Card is annexed hereto as Exhibit 9.

49 See Suffolk County Solid Waste Management Report, 2009.

D. The Totality of the Environmental and Other Impacts of the Generation Process.

1. EfW Converts MSW to Energy More Efficiently Than LFGTE While Providing a Net Reduction in GHG Emissions.

23. New York State includes LFGTE as an RPS eligible technology. When EfW uses the same MSW as fuel it is 9 to 14 times more effective at extracting electricity from that fuel than is LFGTE. An EfW facility generates between 550 and 750 kWh of renewable electricity per ton of MSW processed, while LFGTE only extracts 60-70 kWh from that same ton of MSW (Figure 2).[50] Further, when MSW is used as a generation fuel at an EfW facility instead of being landfilled, significant methane emissions are avoided. Even the most modern landfills in this country cannot capture 100% of the methane they generate when the landfill gas system is in operation and landfills are not required to collect methane over the entire life of the landfill. For example, emissions from the working face of the landfill are completely unregulated for up to five years after waste is placed in a cell to install gas collection, and gas collection systems are allowed to be terminated based on non-methane organic compound emissions ("NMOC"), well before the anaerobic decomposition process is finished.[51]

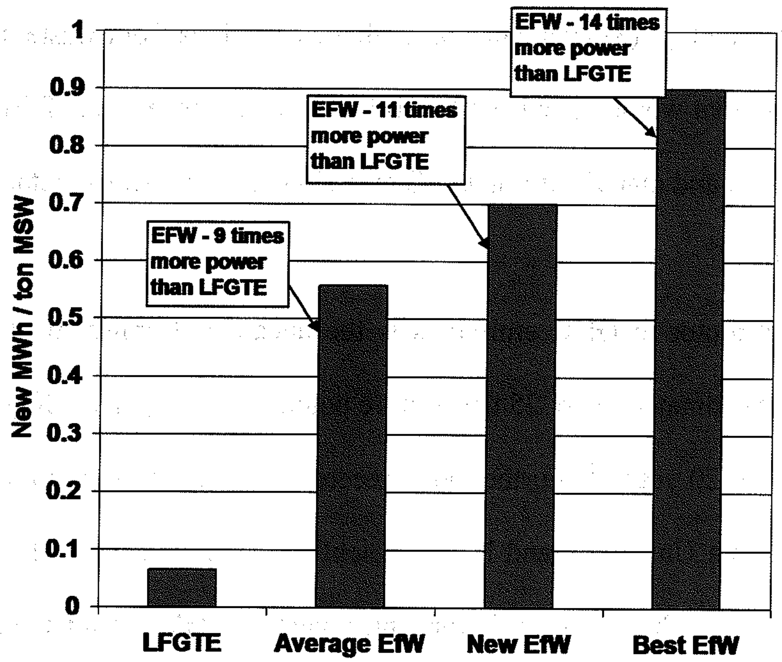
24. The Commission has explicitly approved MSW as an eligible generation fuel by previously designating LFGTE as an eligible technology under New York's RPS program. It should now approve EfW as a technology which utilizes that fuel more efficiently to produce more electricity, while generating no methane emissions whatsoever.

---

50 See Kaplan, supra, at 1711-1717.

51 See 40 CFR § 60.752(b)(2)(ii) and 60.757(e).

Figure 2. Energy Generation per Ton for Post Recycled Waste Management Options



25. The objective of the RPS program is grounded, in part, by the recognized need to control, and dramatically reduce, GHG emissions.[52] In August, 2009, Governor Paterson issued Executive Order 24, establishing a state goal of reducing GHG emissions 80% below 1990 levels by 2050, and directed NYSERDA and NYSDEC to develop a climate action plan. Thus, Executive Order 24 marks a shift in policy by acknowledging that while waste management may have been primarily a local issue, its interaction with global warming justifies statewide coordination and cooperation.[53]

26. EfW mitigates four major greenhouse gas related processes (Figure 3): (1) anthropogenic, or fossil CO_2, caused by GHG emissions from combustion of waste components (plastics, textiles, etc.) made from fossil fuels such as oil and natural gas; (2) avoidance of CO_2

---

[52] See Initial RPS Order, at 23-24 (identifying the RPS objective to "improve New York's environment by reducing air emissions, including greenhouse gas emissions.").

from fossil fuel fired power plants on the local grid which is replaced by the renewable electrical power generated by the EfW facility; (3) avoidance of methane emissions from waste, including factoring-in methane capture, that would have been landfilled in the absence of the EfW facility; and (4) avoidance of extraction and manufacturing GHG emissions due to ferrous metal recovery and recycling at EfW facilities.[54]

27. A major contributor to GHG emissions is the uncaptured emission of methane from landfills, a GHG that is estimated to be 25 times more potent than CO_2 on a 100 year basis, and 72 times more potent over 20 years.[55] Furthermore, recent research published in the journal *Science* by a team of Columbia University and NASA scientists has found that, when indirect aerosol effects are included, the 100 year global warming potential ("GWP") for methane was actually 34 - a finding that was 62% higher than the value reported by IPCC in 1995.[56] EfW technology avoids methane emissions -- a potent GHG – entirely.

---

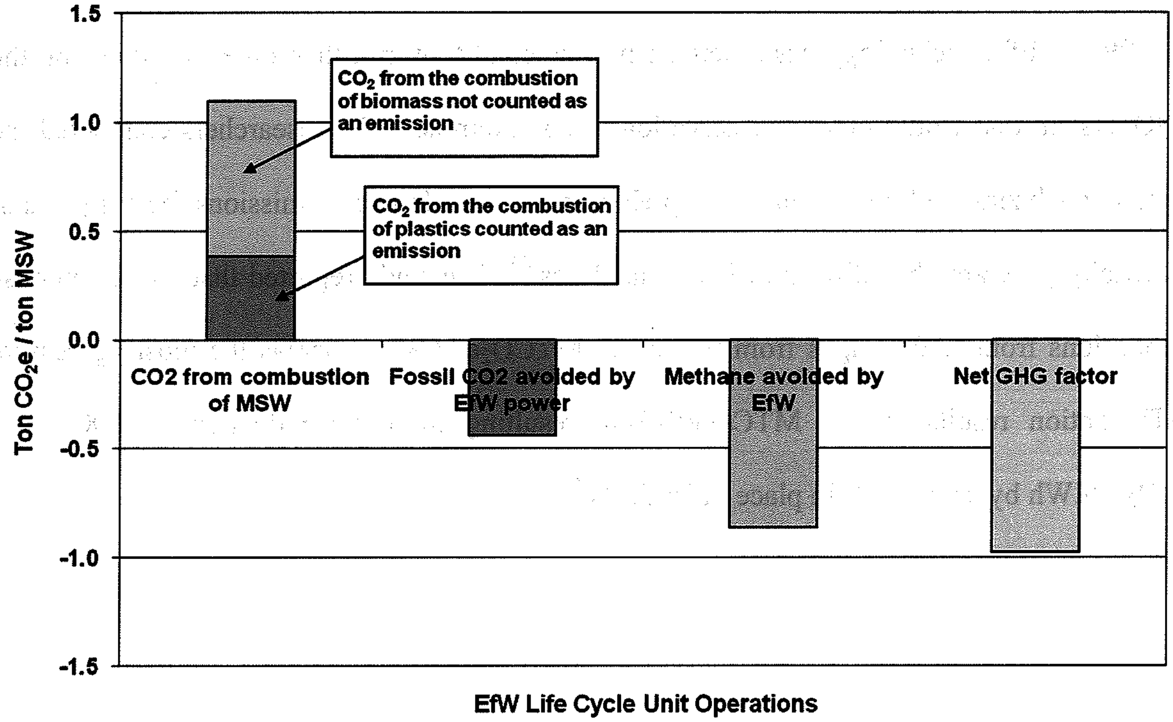
53 cf. January 2010 RPS Order at 15 (characterizing solid waste management and disposal as a predominately local issue).

54 See generally, Bahor, footnote 7, supra.

55 Solomon, S. *et al.*, 2007: Technical Summary in: "Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change" [Solomon, S., *et al.* (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY.

56 Shindell, Drew T., Greg Faluvegi, Dorothy M. Koch, Gavin A. Schmidt, Madine Unger, Susanne E. Bauer, Improved Attribution of Climate Forcing to Emissions, *Science*, **326**, 716-718.

Figure 3. GHG Mitigation of Energy from Waste



28. Based on national averages, current EfW facilities avoid one ton of CO_2 for every ton of MSW processed.[57] Given New York State's reported landfill gas capture and landfill gas to energy rates, as well as lower carbon intensity power grid, current EfW in New York State is estimated to save 0.8 tons of CO_2 for every ton of MSW processed.[58] With their higher efficiencies, new EfW facilities could avoid roughly one ton of CO_2 per ton processed, even accounting for increased landfill gas capture. Even assuming a future state of affairs in which

[57] B. Bahor, M. Van Brunt, K. Weitz, A. Szurgot, "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).

[58] See footnote 15, supra.

New York triples its recycling rate to 60%, new state of the art EfW facilities used to process the remaining waste could reduce GHG emissions by 3 million tons CO_2.[59]

29. EfW technology has a better environmental footprint than other resources on the NYISO system that would otherwise serve load. For example, EPA researchers conducted the first study analyzing and presenting a comprehensive set of life-cycle emissions factors per unit of electricity generated by EfW and LFGTE facilities.[60] The study reported that the greenhouse gas emissions from EfW ranges from 0.4 to 1.5 $MTCO_2e/MWh$, whereas the most aggressive LFGTE option results in 2.3 $MTCO_2e/MWh$, resulting in a net reduction of 0.8 – 1.9 $MTCO_2e/MWh$ by using EfW in place of landfills.[61]

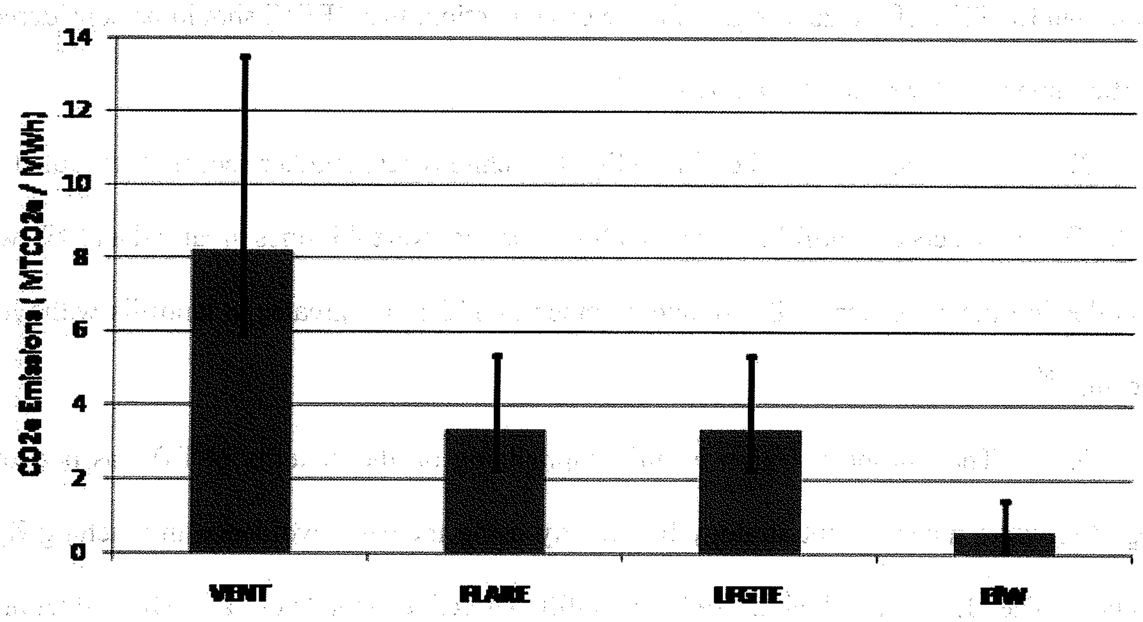
---

59 A 60% recycling and 10% landfilling rate applied to New York's estimated MSW generation of 18.3 million tons of MSW would provide roughly 3 million tons of MSW for energy recovery beyond that already processed in New York's current facilities.

60 Kaplan, footnote 4, supra. See also Eschenroeder, A., "Greenhouse Gas Dynamics of Municipal Solid Waste Alternatives," Harvard School of Public Health, 2001. See generally Bahor, B., et al., "Modern Waste-to-Energy as an Energy and Environmental Management System," Covanta Energy Corp. Copies of the Eschenroeder and Bahor studies are annexed hereto as Exhibits 10 and 11, respectively.

61 Id.

Figure 4. Comparison of GHG Emissions per MWh Generated[62]



30. In terms of energy efficiency, the Kaplan report concluded:

> Hypothetically, if 166 million tons of MSW is discarded in regional landfills, energy recovery on average of ~10 TW h or ~65 (kWh)/ton of MSW of electricity can be generated, whereas [an EfW] facility can generate on average ~100 TW h or ~600 (kWh)/ton of MSW of electricity with the same amount of MSW (Table 3). ***[EfW] can generate an order of magnitude more electricity than LFGTE given the same amount of waste.*** LFGTE projects would result in significantly lower electricity generation because only the biodegradable portion of the MSW contributes to LFG generation, and there are significant inefficiencies in the gas collection system that affect the quantity and quality of the LFG.[63]

---

62 Data extracted from Kaplan, et al., supra. The Kaplan report, a copy of which is annexed hereto as Exhibit 4, contains a broader comparison of potential energy generation methods, including fossil fuel-fired facilities, and, in addition to the above, concludes that EfW outperforms traditional fossil fuel sources in terms of the quantity of pollutants emitted per MWh.

63 Id. (emphasis added).

31. The Kaplan report ultimately determined that, "[EfW] appears to be a better option than LFGTE. If the goal is greenhouse gas reduction, then [EfW] should be considered as an option under U.S. renewable energy policies"[64]

32. As compared to other RPS-eligible technologies, another recent study concluded that the GHG impacts of landfilling, over a 30-year period, were 45 times greater than EfW when gas collection methods were utilized, and as much as 115 times greater in landfills without gas collection.[65]

33. The European Union is fully capitalizing on the benefits of EfW as part of an integrated waste management strategy by directly using methane avoidance in reaching Kyoto targets. The European Union 1999 Landfill Directive mandates a 65% reduction in biodegradable waste landfilled by 2014.[66] EU member states are meeting this mandate by managing waste in line with the EU's waste hierarchy, which favors (in order) reuse, reduction, recycling, and energy recovery over landfilling.[67] High landfill taxes, and an outright ban on new landfill construction in Germany, serve to deter reliance on landfills even further. The European Environment Agency ("EEA") already attributes considerable reductions in waste management GHG emissions to increased levels of recycling and EfW.[68] The Landfill Directive and other waste management policies have been a overwhelming success in Europe's efforts to

---

64 Id. (emphasis added).

65 See Eshenroeder, footnote 60, supra.

66 EU (European Union) (1999) Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste. *Official Journal of the European Communities*. L182, **42**, 1–19.

67 European Union, EU (2008) Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. *Official Journal of the European Union*. L312, **51**, 3-30.

68 European Environmental Agency (2008) Better management of municipal waste will reduce greenhouse gas emissions. (http://www.eea.europa.eu/publications/briefing_2008_1/EN_Briefing_01-2008.pdf)

reduce GHG emissions, reducing over 72 million metric tons per year in 2007 relative to 1990 -- a 34% reduction in the sector -- the highest percentage reduction of any sector in the EU.[69]

2. EfW Emissions Performance Has Improved Significantly and Generally Outperforms LFGTE and Biomass Energy, Two RPS Eligible Technologies, On a per MWh basis. New Facilities Will Offer Even Higher Levels of Performance.

34. Since the early development of EfW technology, the application of improved combustion design, operational practices, air pollution control equipment and changes in waste-load composition have resulted in a dramatic decrease in all pollutants, including criteria pollutants, heavy metal emissions and others. In fact, the Commission's past expressions of concern regarding air emissions from EfW facilities appear to have been aimed at data derived from earlier EfW operations or even incineration (combustion without energy recovery), and do not reflect EfW facility operations that utilize modern environmental controls, such as those operated by Covanta in New York today.[70]

35. Nationally, as part of the Clean Air Act, the industry implemented extremely effective controls and operational procedures as part of the implementation of the Act's Maximum Achievable Control Technology ("MACT") emissions standard. In 2007, the U.S. EPA noted that "the performance of the MACT retrofits has been outstanding" outlining the emissions reductions in Table 1.[71]

---

69 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_90).

70 See, e.g., Initial RPS Order at 8; April 2010 RPS Order at 14-15.

71 See Letter to Large MWC Docket, footnote 12, supra.

Table 1. Emissions Performance of Energy from Waste Facilities, 1990 to 2005

Pollutant	1990 Emissions (tpy)	2005 Emissions (tpy)	Percent Reduction as %
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
HCL	57,400	3,200	94
SO2	38,300	4,600	88
NOx	64,900	49,500	24

* dioxin/furan emissions are in units of grams per year toxic equivalent quantity (TEQ), using 1989 NATO toxicity factors; all other pollutant emissions are in units of tons per year.

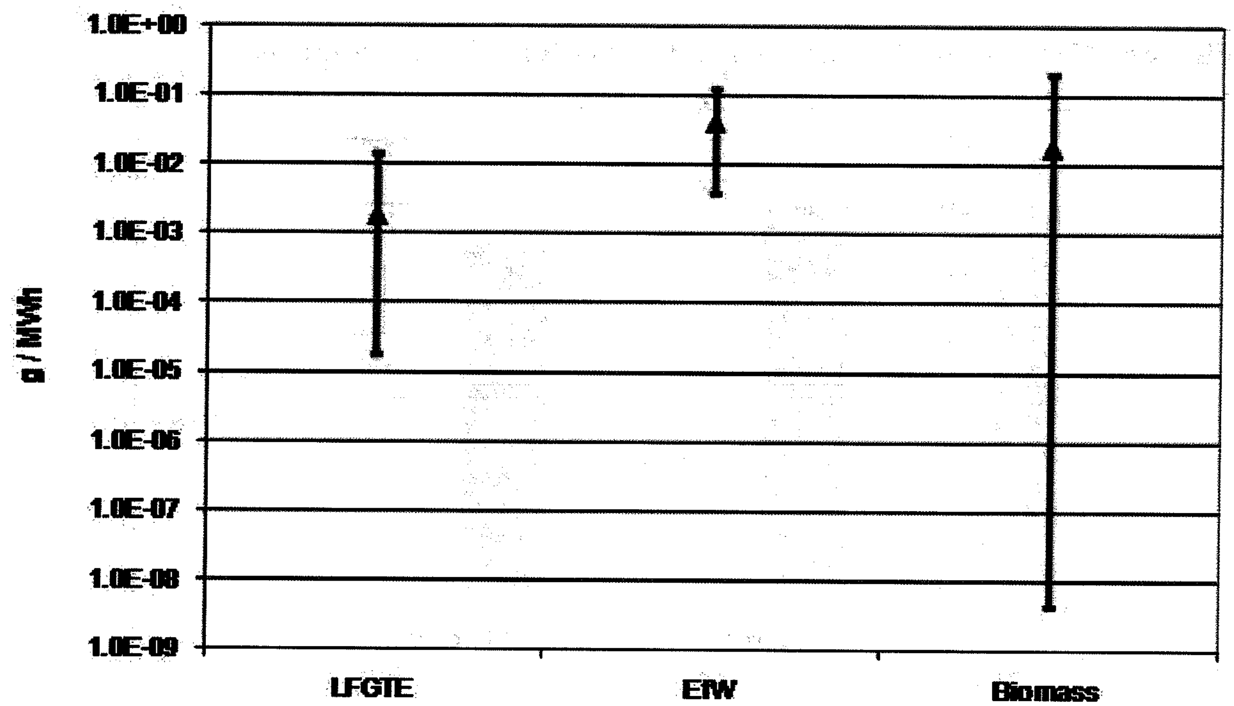
36. Changes in waste composition and more sophisticated and effective capture and disposal methods have significantly mitigated the concerns expressed during prior stages of this proceeding.[72] Specifically, the use of mercury in the U.S. decreased from over 250 tpy in 1970 to less than 400 tpy nationwide by 1996.[73] Accordingly, there is dramatically less mercury being used in commerce or being released into the environment. That factor, when coupled with advanced emissions controls and best management practices, reduced mercury emission from EfW facilities in the U.S. 96% from 1990-2005.[74] Thus, mercury emissions from EfW, on a per MWh basis, are comparable to those from both LFGTE and wood waste to energy, both RPS-eligible sources (Figure 4).

72 See Initial RPS Order at 36.

73 United States Environmental Protection Agency, 1997, "Mercury Study Report to Congress Vol. II: An Inventory of Anthropogenic Mercury Emissions in the United States." (http//www.epa.gov/ttn/oarpg/t3/reports/volume2.pdf).

74 See Letter to Large MWC Docket, supra.

Figure 5. Comparison of Covanta's New York EfW Facilities Hg Emissions Factors with RPS Eligible Sources[75]



Notes: NYS EfW emission factors based on stack test data from 2006 – 2009. LFGTE and WWTE factors adopted from US EPA AP-42, *Compilation of Air Pollutant Emission Factors.*

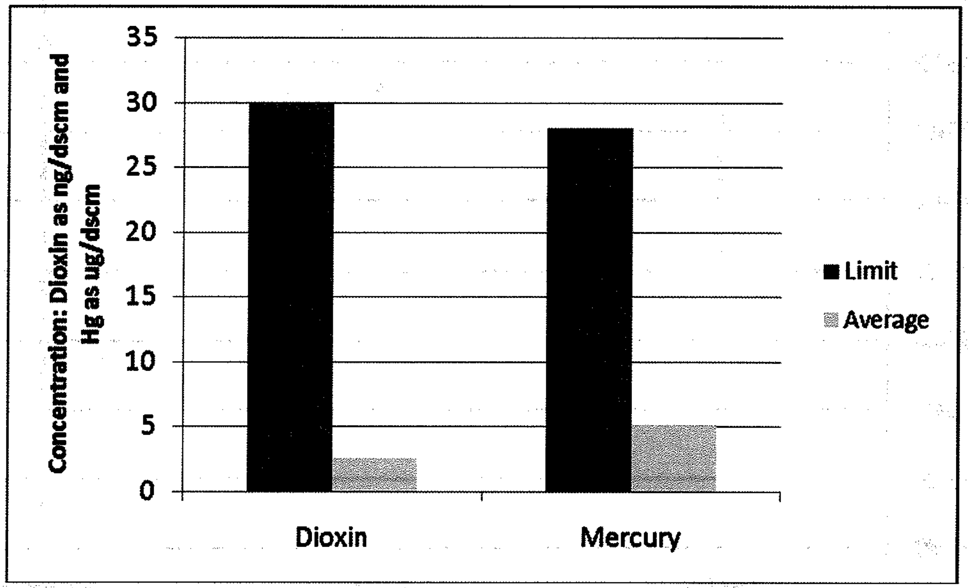
37. Federal limits for mercury emission from EfW were reduced from 80 μgμ/dscm to 50 μgμ/dscm in 2006. However, New York's limit of 28 μgμ/dscm is the most stringent stack emission limit imposed on Covanta's New York fleet. To comply with this stringent limit, Covanta's air pollution control equipment captures 95% of mercury emissions, removes it from the flue gas, and converts the recovered mercury into a stable reaction product in the ash residue. Due to the pozzolanic nature of the ash residue, the mercury is fully contained and stored for proper disposal. As a result, emissions from Covanta's EfW facilities are less than 20% of the most stringent standard, New York's, and the reaction products are stable. By way of contrast,

---

75 See footnote 15, supra. Range of EfW Hg emissions factors represent Covanta stack test data and actual net energy generation as electricity from 2006 - 2009.

landfills emit mercury from both stacks and as fugitive emissions; however, flares, engines, and turbines used for emission control at landfills do not control mercury emissions.

Figure 6. Comparison of Hg and Dioxin Limits with NYS Permit Limits[76]



38. This significant improvement in emissions is highlighted in the aforementioned lifecycle report authored by EPA researchers. The report concluded that EfW produces significantly lower lifecycle NO_x emissions than LFGTE,[77] with typical SO_2 levels also being lower than LFGTE.[78] Again, this empirical evidence shows that EfW has an improved environmental footprint with less impact on the environment then other resources on the NYISO system.

---

76 Average Covanta stack test emissions for New York State facilities 2006 - 2009.

77 Kaplan, supra, at 1714.

78 Id. The Kaplan report further concludes that SO_x emissions from EfW are approximately 10 times lower than the SO_x emission from coal- and oil-fired power plants employing modern flue gas controls.

Figure 7. Comparison of Emissions of Nitrogen Oxides (NO_x) per MWh Generated[79]

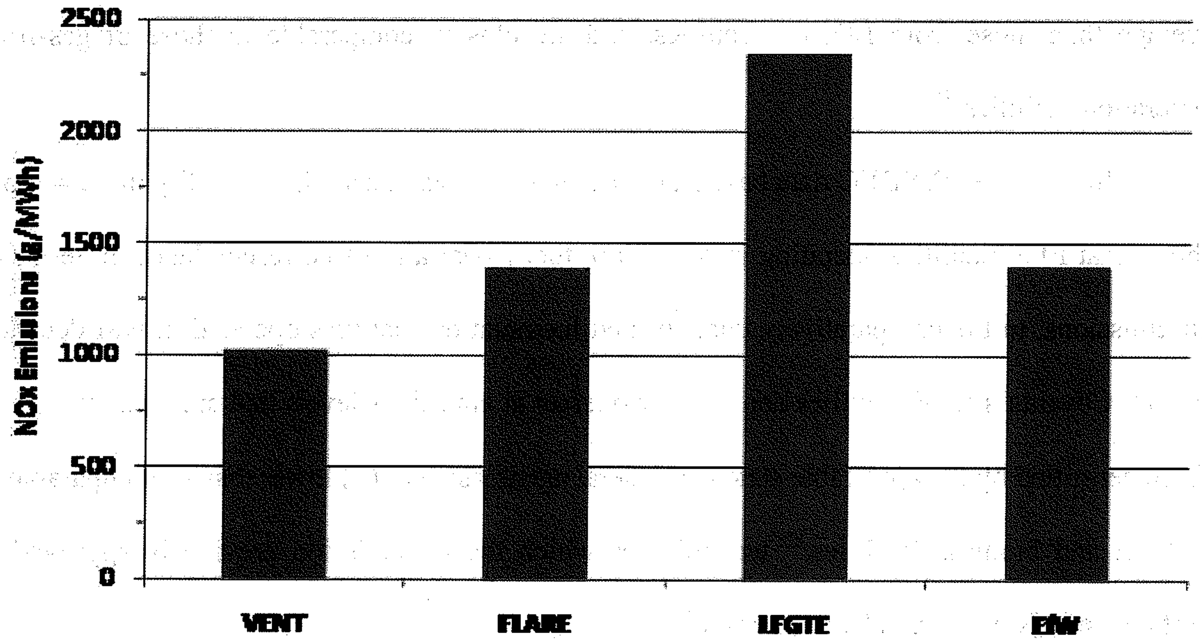
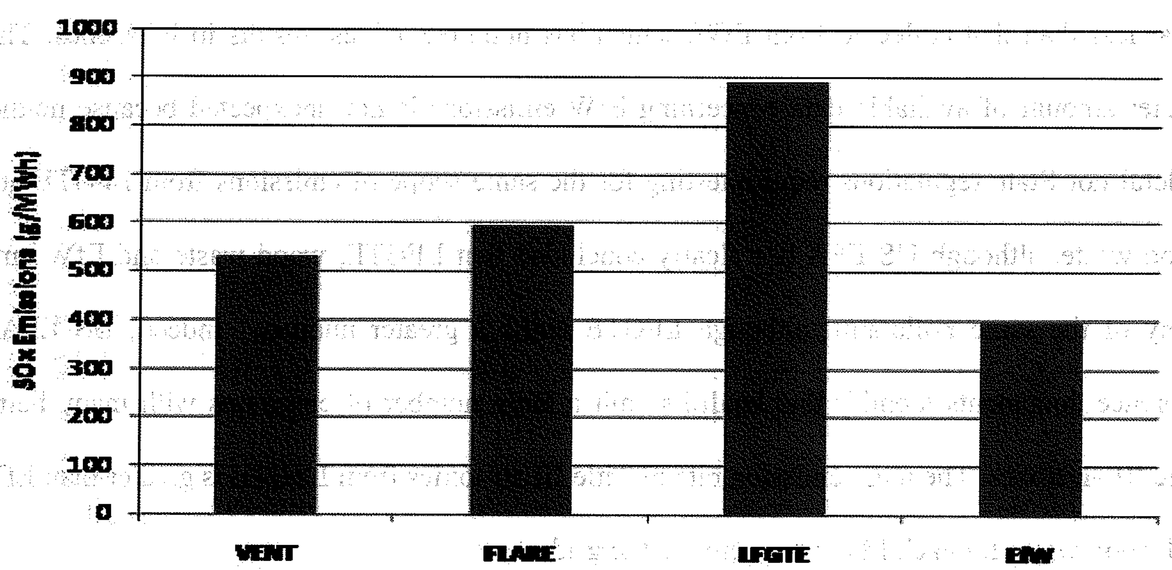


Figure 8. Comparison of SO_x Emissions per MWh Generated[80]



---

[79] See footnote 62, supra. *cf.* Initial RPS Order, pp. 39-40 (purporting to compare EfW to traditional fossil fuel burning plants).

[80] See footnote 62, supra.

39. Life-cycle particulate matter ("PM") emissions from EfW are also 75% lower on average than those from LFGTE facilities, and are closely comparable to those of gas-fired generation facilities.[81]

40. The NYSDEC data base from compliance tests at each EfW facility in New York shows that EfW facilities operating in New York today bear almost no resemblance, in terms of air emissions, to the comparatively uncontrolled incineration facilities operated in past decades. In fact, Covanta's EfW facilities consistently operate at emissions levels that are (i) a fraction of those permitted by the applicable state and federal agencies; and, (ii) lower than or comparable to LFGTE and biomass facilities,[82] technologies which the Commission previously approved to participate in New York's RPS program.[83]

41. A comparison of emissions from EfW, wood waste to energy and LFGTE is difficult because the amount of emissions data collected from LFGTE and wood waste to energy is far less than that collected from EfW, which has hundreds of test results in EPA files. This greater amount of available data concerning EfW emissions is not unexpected because neither Federal nor State regulations require testing for the same scope of emissions from LFGTE and wood waste, although US EPA has clearly concluded that LFGTE, wood waste and EfW emit many of the same pollutants, although LFGTE emits a greater number. Indeed, US EPA's reference documents identify that landfills emit a large number of emissions with many being Title III air toxics. The mass emission rate of Title III air toxics from LFGTE is greater than EfW and wood waste for each MWh delivered to the grid.

---

81 Id.

82 EfW emissions are also either less than, or highly competitive with, the emissions levels from traditional fossil fuel-fired facilities.

83 Initial RPS Order at 8.

42. Table 2 below, prepared from Covanta emissions data from 2000 - 2008 and the US EPA emission factors database AP-42 shows that LFGTE emits over 500 times the amount of combined non-methane organic compounds and total hydrocarbons when compared with EfW.[84] This is not surprising given that EfW is a sophisticated combustion process with automated combustion controls to maximize energy recovery, whereas LFGTE do not have the same level of control or any comparable air pollution control technology. The same USEPA emission factor references reveal that EfW has the same or better environmental performance than wood waste and LFGTE. In addition, wood waste and LFGTE emit additional pollutants not produced by EfW.[85]

[84] United States Environmental Protection Agency, 2003, AP 42, "*Compilation of Air Pollutant Emission Factors; United States Environmental Protection Agency, 2008, AP 42, Compilation of Air Pollutant Emission Factors*"; *United States Environmental Protection Agency, "An Inventory of Sources and Environmental Releases of Dioxin-like Compounds in the United States for the Years 1987, 1995 and 2000," EPA/600/P-03/002F/, November 2006.*

[85] Table 2 also establishes that when EfW and the other processes emit the same pollutants, EfW equals or improves upon the performance of those processes. It is also notable that the emission characteristics of wood waste, landfill gas combustion and EfW are not equally documented because LFGTE and wood waste are not required to conduct annual stack tests for dioxin required of EfW facilities despite general knowledge that both emit dioxins and furans and many other organics.

Table 2.

Parameter	EfW	LFGTE	WWTE
USEPA's AP-42 Listed Pollutants			
Total Count	13	171	91
Number of Title III Air Toxics	8	44	41
Emission factor as grams/MWh[86]			
Title III Air Toxics	0.4	253	57
NMOC (Includes THC from Combustion)	23	11,903	No Data
PAH	0.003	0.254	0.636
BaP	5.1E-06	1.9E-05	0.01
Vinyl Chloride	ND	3.6	0.09
Dioxin as TEQ[87]	3.7E-07	5.6 E – 08 to 9.7E-12	5.2E-07
Megagrams/year/million MWh			
Mass Emission Rate for NMOC	23	11,903	No Data

43. In 1987, before more stringent environmental regulations were enacted, EfW facilities in the United States emitted 8,900 grams (as toxic equivalent quantity - TEQ) of dioxins annually.[88] Today, the total annual dioxin emissions from the nation's 87 EfW plants are only 15

86 In AP 42, LFGTE emission factors are presented in units of ppmv and biomass emission factors are presented in units of lb/MMBtu heat input. LFGTE factors converted into g/MWh assuming a lifetime collection efficiency of 46% (see Bahor, et al., 2010), a lifetime methane potential of 100 m3 CH_4 / Mg MSW, 50% CH_4 content in landfill gas, and a net assumed generation of 104 kWh/ton MSW. Biomass emission factors converted into net generation using an assumed heat rate of 11,000 BTU/kWh and a wood HHV of 4,500 BTU/lb, both from New York State 2009 EIA 906/920 data. EfW emissions factors represent Covanta New York facilities, except for vinyl chloride. Vinyl chloride results from Covanta's Essex County facility, which receives waste from New York City.

87 Dioxin is presented as a range due to the small database in the United States and to recognize additional data from the United Kingdom Department for Food, Environment and Rural Affairs ("DEFRA")Department for Environment, Food and Rural Affairs (U.K.), Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes, March 2004.

88 United States Environmental Protection Agency, "An Inventory of Sources and Environmental Releases of Dixon-Like Compounds in the United States for the Years 1987, 1995 and 2000," EPA/600/P-03/002F/, November 2006.

grams TEQ T oz.[89] -- ***a total reduction in dioxin/furan emissions of 99.8%.***[90] Consequently, after conducting a comprehensive study of emissions from EfW facilities nationwide, the USEPA determined that there has been a 99.9% reduction in dioxin and furan emissions from EfW since 1990.

44. New EfW facilities will offer even higher levels of performance, as a result of new emissions control technology, better and more efficient boiler design, and improved combustion control systems. For example, Covanta's patent pending Very Low NO_x (VLN) technologies can achieve 0.8lb/MWh emission factors.[91] New scrubber technology can yield SO_2 emission factors in the 0.1 lb/MWh range.[92] Each MWh generated by EfW avoids a significant amount of these pollutants, both of which are known precursors for the formation of fine particulate (PM 2.5) in the atmosphere. Ten counties in New York are designated as being in nonattainment of the 2006 PM 2.5 National Ambient Air Quality Standard, with several of these counties having EfW operations. Therefore EfW is already helping to reduce ambient PM 2.5 concentrations by avoiding increases which would occur from coal based operations in those areas.

89 See Letter to Large MWC Docket, footnote 12, supra.

90 Id.

91 Van Atten, C. et al., 2008, "Benchmarking Air Emissions of the Largest Electric Power Producers in The United States." (http://www.nrdc.org/air/pollution/benchmarking/default.asp).

92 Id.

E. The Extent to Which the Resource Will Result in New and Incremental Renewable Energy.

45. Today, 6.7 million tons of MSW are landfilled in New York State annually, and another 6 million tons are exported for disposal.[93] This high level of landfilling is directly associated with a low recycling rate: New York's MSW recycling rate is only 20%.[94] This continued burial of the waste resource represents a tremendous lost opportunity. Even assuming a future state of affairs in which New York triples its recycling rate to 60%, new state of the art EfW facilities could generate 2.3 million base load MWh/year (enough for nearly 200,000 homes)

46. In prior stages of this proceeding, the Commission questioned the compatibility of EfW and recycling, expressing the concern that recycling rates could potentially decrease as EfW capacity increases.[95] This hypothesis is apparently based on the erroneous and outdated assumption that communities which commit to a long-term plan with capital investment in EfW will forego recycling to assure that there is adequate MSW for the EfW facility. In fact, the opposite has proven to be true. Data reveals that communities which host EfW facilities appear to be more likely to engage in aggressive and effective recycling programs.[96] The New York Solid Waste Management Plan came to the same conclusion, noting that "communities with MWCs ("EfWs") tend to have slightly higher recycling rates than average," and "success in

---

93 Id.

94 See *Beyond Waste* at 178.

95 See April RPS Order at 13.

96 Berenyi, E.B., "Recycling and Waste-to-Energy: Are They Compatible?" A copy of this report is annexed hereto as Exhibit 12.

recycling in NYS has a stronger correlation to the level of investment in recycling outreach, education and infrastructure . . . than the type of facility."[97]

47. The issue of compatibility of EfW with local recycling efforts was independently evaluated in 1993[98] and again in 2003,[99] with both reports generally concluding that EfW and recycling are indeed compatible. Some of the reasons why the two processes are compatible include:

- Communities with recycling programs are more accountable and responsible in managing their waste through competent long term planning, instead of sending it out of state for disposal by the lowest cost option, landfilling.
- EfW facilities do not want MSW with high levels of plastic or paper and also do not want segregated deliveries of these materials because their high calorific value can reduce the mass throughput of a facility, which translates to reduced revenue from tipping fees. As a result, a community that has high recycling rates coupled with EfW has a win-win through separation of components for recycling and recovery of energy from remaining non-recycled components.[100]

48. Recent data also supports a finding that EfW is not a deterrent to comprehensive and effective source-separation and recycling programs. For example, in 2004, the average recycling rate for communities with EfW facilities was 34%, whereas the national average at that

---

97 *Beyond Waste* at 189-190.

98 Kiser J.L., "Recycling and Waste-to-Energy: Working Well Together," Solid Waste & Power (1993) (cited in, Bahor, et al., supra., "Modern Waste-to-Energy As An Energy and Environmental Management System" at 7-8). A copy of this report is annexed hereto as Exhibit 13.

99 Kiser J.L., "Recycling and Waste-to-Energy: the ongoing compatibility success story," May/June 2003 MSW Management (cited in, Bahor, et al., supra., "Modern Waste-to-Energy As An Energy and Environmental Management System" at 7-8). A copy of this report is annexed hereto as Exhibit 14.

100 Bahor, et al., supra., "Modern Waste-to-Energy As An Energy and Environmental Management System" at Table 10.

time was 31%.[101] In New York State, Onondaga County - host to one of Covanta's EfW facilities - has one of the highest recycling rates in the State at 51%.[102] Similarly, a recent study of recycling rates in Long Island communities conducted by Citizen's Campaign for the Environment ("CCE") rated those communities in which Covanta's EfW facilities were located (*i.e.*, the Towns of Hempstead [B+], Babylon [A], Huntington [A+], and Islip [A+]) as having among the highest recycling rates - none of which rated less than a "B+" on the CCE rating scale.[103] In other words, EfW and comprehensive and effective recycling efforts appear to go hand in hand. This observation is consistent with trends in the United States[104] and the European Union where EfW has not been found to be a deterrent to recycling. In fact European Union Member States with the highest recycle rates use EfW instead of landfilling whereas, by way of contrast, Member States that rely on landfilling have the lowest recycle rates.[105]

49. This objective data demonstrates that modern EfW facilities can stand alongside recycling efforts to form a critical part of an integrated solid waste management plan. EfW compliments the three R's, and adds an additional element – Recovery. As noted in the NYSWMP, EfW also contributes to the recycling of 95,470 tons of metals -- 2.4% of the waste stream -- which would otherwise have been lost to recycling by being landfilled.[106]

---

101 Kiser, J.L., "Understanding Why Recycling and Waste-To-Energy are Compatible in the U.S." (2005) (http://www.energyrecoverycouncil.org/userfiles/file/IWSA_2007_Directory.pdf) (cited in, Beyond Waste, supra, at 189.

102 *Beyond Waste*, at 189 and Appendix C.

103 See "Long Island Recycling Report Card," footnote 48, supra.

104 Berenyi, E., footnote 96 supra.

105 European Environment Agency, 2007, Europe's environment: the fourth assessment Copenhagen. (http://www.eea.europa.eu/publications/state_of_environment_report_2007_1).

106 See *Beyond Waste*, at 185.

50. The Commission recently addressed the potential deterrent effect of RPS-eligible technologies on local reuse and recycling efforts in another context in this proceeding and concluded that those concerns were unfounded:

> We share DEC's and NiGen's concerns that clean wood recovered from C&D debris should be used appropriately and in concert with the priorities set for New York. While it seems appropriate to assure that all clean wood materials be recycled or reused that can be, assuring that such occurs can be difficult. If sufficient markets do not already exist to support full reuse and recycling of valuable C&D debris materials, it seems reasonable that increasing market demand for those products for energy generation could act to promote the increased development of C&D processing facilities, and a resulting increase in uses of the clean wood produced in them. ***Assuming that the parties' apparent agreement that granting NiGen's proposal would likely reduce the amount of clean wood currently going into landfills, it seems reasonable to postulate that the proposal would likely not act too strongly to divert the clean wood waste stream away from competing reuse and recycling.***[107]

51. As the Commission observed, "the act of putting the material into the . . . waste stream indicates that it has been deemed as 'unrecyclable for its intended use' at the source and therefore it can be used for the production of energy."[108] There is no reason that this same rationale should not apply equally to EfW, and its relationship to recyclable materials, particularly in light of the current plateau in recycling levels statewide.

52. In sum, recycling and EfW belong in the same conversation, exactly as contemplated by New York's solid waste hierarchy; which states that the preferable disposal method for waste that is not recycled or reused is energy production through combustion in an EfW facility.

---

107 See Case 09-E-0843, 03-E-0188, "Order Approving Petition with Modifications," (issued November 22, 2010) at 11-12. (Emphasis supplied).

108 Id. at 12.

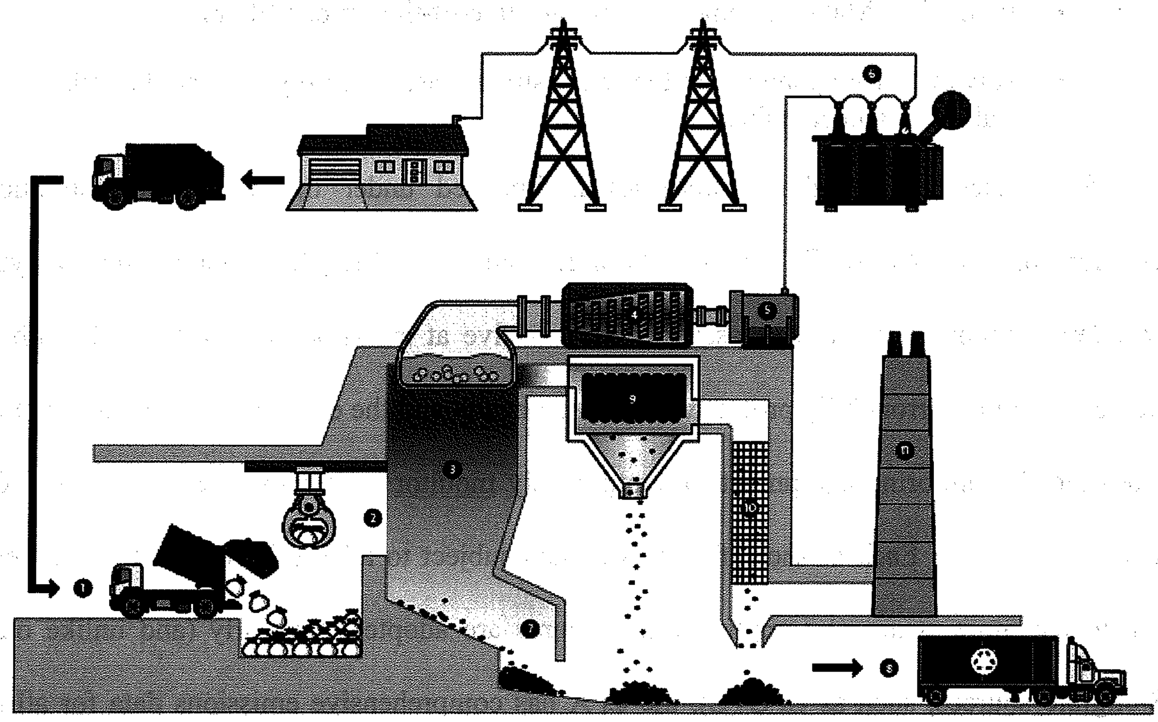
F. The Nature of the Process For Transforming Fuel Into Electricity.

53. EfW relies on a reliable, highly-engineered and controlled process design to maximize the amount of energy recovered while minimizing emissions and other environmental impacts. All flue gases from the process are directed to a series of sophisticated air quality control systems for cleaning. Prior to their emission from the stack, flue gases are closely monitored using advanced continuous emissions monitoring systems ("CEMS"). CEMS are a combination of equipment, instruments, and data management that provide virtually continuous information on certain emissions from each unit at an EfW facility. Continuous, reliable and accurate data is available for criteria pollutants (nitrogen oxides [NOx], sulfur dioxides [SO2], carbon monoxide [CO] and particulate matter [PM]) that are controlled to certain levels deemed fully protective of human health and the environment. Other RPS-eligible technologies with emissions either have no CEMS requirements (i.e. LFGTE), or less stringent monitoring requirements (i.e. biomass to energy). Further, after any non-combustible residue (ash) from the EfW process cools, magnets and other mechanical devices pull metals from the ash for further recycling. This is an important step, since EfW plants thereby recycle thousands of tons of metals from its ash.[109]

---

[109] *Beyond Waste* at 185.

Figure 9. EfW Process for Turning MSW into Renewable Electricity



How energy from waste works

1
Municipal waste is delivered to our facilities and stored in a bunker.

2
The waste is transferred to a combustion chamber where self-sustaining combustion is maintained at extremely high temperatures. We maintain the building around the tipping and bunker area under negative pressure and use this air in the combustion process to control odor.

3
The heat from the combustion process boils water.

4 & 5
The steam from the boiling water is used directly or more frequently, the steam drives a turbine that generates electricity.

6
Electricity is distributed to the local grid.

7
Ash from combustion is processed to extract metal for recycling. It is then combined with residue from the air pollution control process (see items 9 and 10).

8
The combined ash is either disposed of in a monofill that receives only that waste, used as cover material at a conventional landfill, or landfilled with other waste.

9
All gases are collected, filtered, and cleaned before being emitted into the atmosphere. We manage gas from the combustion process with state-of-the-art air pollution control technology that operates to state and federal standards.

10
We control emissions of particulate matter primarily through a baghouse (fabric filter).

11
We monitor criteria and other pollutants and operating parameters to ensure compliance with permit conditions.

54. Further, EfW facilities, particularly since enactment of the federal Clean Air Act Amendments of 1990 and 2000, meet some of the most stringent environmental standards in the world and employ the most advanced emission control equipment available.

- NOx emissions are controlled by urea or ammonia injection or via processes such as Covanta's LowNOx and VeryLowNOx technologies
- Dioxins and mercury are removed through activated carbon injection and the semi-dry scrubber process

- HCI and SOx are removed through lime injection
- Particulate Matter is removed through state-of-the-art bag filters
- Any mercury remaining in the waste stream (ash) is safely isolated, bound, stabilized and contained.

55. Each of the above processes is imposed under the close and continuous supervision of the NYSDEC. First, NYSDEC conducts SEQRA review and analyzes independently prepared health-risk assessments to arrive at emissions limits deemed (with an adequate margin for error) fully protective of human health and the environment. NYSDEC then uses advanced monitoring equipment to continuously monitor emissions of SO_x, NO_x and CO from EfW facilities. Each of these facilities is also subject to a Title V review every 5 years during which more stringent compliance procedures are adopted. Similarly (and unlike other RPS-eligible sources, such as LFGTE), the EPA has comprehensive emissions data for all the operating EfW facilities in the United States as a result of annual stack testing required by the CAA, the very purpose of which is to ensure that the permitted limits actually cover all applicable pollutants and remain sufficiently protective of human health and the environment. In sum, EfW is an engineered process with continuous controls, dedicated air pollution control systems and continuous monitoring of operations and emissions, all of which are closely regulated by the EPA and NYSDEC.[110]

G. The Degree of Development of the Resource.

56. As previously stated, relegating MSW to land-based disposal is environmentally harmful, particularly given its GHG emissions impacts, as compared with utilizing it as

---

[110] In contrast, it is difficult to quantify emissions from landfill processes with any degree of certainty since emissions from biological processes are difficult to predict, occur over multiple decades, and are distributed over a relatively large area covered by the landfill. See Kaplan, supra, at 1711.

feedstock for energy generation in EfW facilities. Furthermore, land disposal, while often less expensive than EfW when considering near term costs, presents a significant financial liability associated with a long term (100+ year) biologically and chemically active system, including continued operation and maintenance, and risk of groundwater contamination. It is important to remember that landfills are forever with legacy issues being passed on to future generations.

57. As demonstrated at length herein, EfW technology has undergone major efficiency improvements and emissions reductions. Indeed, its process, in its entirety, produces substantial net carbon reductions. Moreover, unlike other RPS-eligible technologies, such as biomass, which have encountered difficulty ensuring adequate and consistent fuel supplies, EfW has a predictable fuel source, which can be utilized effectively and on a complementary basis in concert with local source separation and recycling efforts.

H. The Probable Cost of Providing RPS Program Support for that Resource.

58. EfW technology is already in widespread use in New York and is closely monitored by the EPA and NYSDEC. Thus, the cost of its inclusion in the RPS program will be limited to Main Tier awards granted to EfW facilities.

II. THE APPLICATION OF OTHER CRITERIA THAT WERE NOT FORMALLY ADOPTED ALSO SUPPORTS A FINDING OF ELIGIBILITY.[111]

A. The Potential for Widespread Application of EfW Technology.

59. EfW technology is already in widespread use both in the United States and internationally, and is thus fully-understood. Covanta currently operates 41 EfW facilities in the U.S. alone, with 350 employees (about 50 employees per facility) in New York and a $28

[111] See Initial RPS Implementation Order at 34-35 ("We will not formally adopt the evaluation criteria suggested by Plug at this time, although these criteria might provide useful guidance.").

million per year payroll in New York State. It pays approximately $3 million per year in local property taxes and host payments. A typical, 1,500 ton per day EfW facility creates 1,000 construction jobs and 100 permanent primary and secondary jobs.[112] There is also a significant trickle down to the local community due to full time jobs, purchasing of commodities by the facility and community outreach which is a common practice at each of our facilities.

B. The Potential for Significant Environmental and/or Energy Security Benefits.

60. In the Initial RPS Order, the Commission adopted for the RPS Program, *inter alia*, the objective of "Generation Diversity for Security and Independence," which it described as "diversify the generation resource mix of energy retailed in New York State to improve energy security and independence, while ensuring protection of system reliability."[113] EfW, which relies exclusively on the substantial amounts of indigenous MSW available in New York State as its principal feedstock, helps to ensure energy independence. For example, based on national averages, one ton of MSW processed at an EfW facility offsets:

- 1 barrel of oil
- ¼ ton of coal[114]
- 1 ton of GHG emissions[115]

---

112 See Covanta Energy Corp., Re-Birth of the United States Energy-from-Waste Industry, supra.

113 Initial RPS Order, P 23.

114 Themelis, J.N., Millrath, K, "The Case for WTE as a Renewable Source of Energy," Presented at North American Waste to Energy Conference (NAWTEC) 12, Savannah, Georgia, May 2004. A copy of this report is annexed hereto as Exhibit 15.

115 B. Bahor, M. Van Brunt, K. Weitz, A. Szurgot, "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).

61. To date, New York's RPS program has been dominated by wind generation awards.[116] EfW, a technology that is base load in nature, also will provide important fuel diversity and energy security within the RPS program itself.

62. Further, EfW is the only resource that provides net carbon reductions -- one ton of MSW processed in an existing New York EfW facility reduces 0.8 ton of CO_2 equivalents when compared to landfilling with new state of the art facilities capable of reducing emissions by 1 ton CO_2 equivalents for every ton of waste processed.[117] EfW can process a ton of MSW in an hour, rather than having it reside in a landfill forever, biologically and chemically active for 100 years or more.[118] EfW technology avoids 100% of the harmful methane emissions generated by landfill disposal, and generates far more net electrical power per ton of MSW processed than any RPS-approved landfill process. Thus, the environmental and security benefits of EfW are tangible, and far outpace those of technologies, such as LFGTE, that have already been deemed eligible to participate in the RPS Program.

C. Whether the Technology is Technically Mature.

63. Since the early development of EfW, improved design and operational practices, air pollution control equipment, more stringent environmental regulations including the Clean Air Act and subsequent amendments, changes in waste composition, and, in the case of Covanta, an increased focus on environmental performance through the Company's Clean World Initiative, have resulted in significant reductions in emissions. For example, as of 2005, the EfW industry has reduced emissions of dioxins from EfW facilities by more than 99% relative to

---

116 See footnote 15, supra.

117 See footnote 15, supra.

118 See Gentil, et al., 2010, "Models for waste life cycle assessment: Review of technical assumptions, " Waste Management 30 (12) 2636-2648. A copy of this report is annexed hereto as Exhibit 16.

1990, and has reduced mercury emissions by 96%. These technologies have proven to be reliable, and the resultant emissions reductions are both sustainable and enforceable. New facilities will exhibit even better levels of environmental performance.

64. Analyzing recent data reveals that the technology is technically mature, uniquely provides net carbon reductions and offers New York State a reliable, base load source of power.

D. Whether the Technology is Capable of Commercialization With Incentives in the Range Needed by the Technologies That Are Already Eligible.

65. Not applicable.

E. The Level of Participation by Already Eligible Technologies.

66. Not applicable.

F. If There Were More Applications Than Funds Available, Whether More Technologies Should Not Be Added Without a Compelling Reason.

67. Not applicable.

CONCLUSION

How best to manage the discarded portion of the waste stream, after reduction, recycling and reuse, remains a critical concern in New York State. Taking into consideration the impacts and benefits that derive from its process as a whole, EfW technology stands alone in its ability to achieve net carbon reductions. In contrast to other RPS technologies, EfW is not intermittent in nature and is a reliable base load supply of renewable energy that decreases dependence on fossil fuels while increasing diversity of energy generation in New York State as a whole as well as within the RPS program itself. In addition to providing base load fuel diversity, as demonstrated above, EfW generates substantially more electricity than LFGTE -- an RPS eligible technology -- while using the same amount of waste, and does so in a more environmentally efficient manner. Accordingly, EfW should be deemed an eligible technology under New York's RPS program.

DATED: February 11, 2011
Albany, New York

Doreen Unis Saia, Esq.
William A. Hurst, Esq.
Greenberg Traurig, LLP
54 State Street, 6th Floor
Albany, New York 12207
Phone: (518) 689-1400
Fax: (518) 689-1499

Attorneys for
Covanta Energy Corporation

1,430,349v1

VERIFICATION

STATE OF NEW JERSEY)
) ss.:
COUNTY OF MORRIS)

Kirk J. Bily, being duly sworn, deposes and states that she/he is the Vice President + D.G.C of the Covanta Energy Corporation, the petitioners in the above-captioned proceeding; that she/he has read the foregoing Petition and knows the contents thereof; that the same is within her/his knowledge true, except to matters therein stated upon information and belief, and as to those matters deponent believes them to be true. The grounds of her/his knowledge are a review of Covanta's books and records and other publicly available reports and studies, and the results of her/his own investigation.

Kirk J. Bily

Sworn to before me
this 4th day of ~~January~~ February, 2011

Jane Gross
Notary Public

Jane Gross
Notary Public, State of New Jersey
Passaic County
Notary No. 2097574
My Commission Expires Feb. 25, 2012