Intermittent Operating Status for Municipal Solid Waste Facilities

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MIWG
9/6/2012
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DRAFT – FOR DISCUSSION PURPOSES ONLY

Background

- NYISO proposes to include Municipal Solid Waste (previously referred to as Refuse Burners) as one type of fuel for Intermittent Power Resources
- MSW facilities would be exempted from Persistent Undergeneration Charges and be eligible for Overgeneration Compensation
- Previous presentations at MIWG 7/3/2012, BIC 7/11/2012, and MIWG 8/23/2012

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Recap

- **All existing MSW burning facilities show incapability of being precisely controlled**
  - ***Onsite Audit***
  - ***Plant Characteristics Review***
  - ***Generation Performance Analysis***

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Address MP feedback

- **The exemption for Undergeneration Penalties and uncompensated Overgeneration will exist only for current MSW.**
- **Cost allocation related to Undergeneration Charges and Overgeneration Compensation can be found:**
  - ***Accounting and Billing Manual, section 8.4, Regulation and Frequency Response Service (Charges)***

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Proposed Tariff Changes - I

- **MST 2.13 Definitions – M**
  - ***Municipal Solid Waste (MSW) Facility:*** *A generation facility in operation as of October 1, 2012 using pre-processed trash or garbage derived from residential, commercial, and institutional sources, not otherwise subject to drying and pelletizing, chipping and milling, or shredding to convert it into refuse derived fuel which is a mass burn facility. for the purpose of generating electricity. A generation facility that uses fossil fuels and MSW to generate electricity shall not be considered a MSW facility unless the use of fossil fuels is limited to startup and/or to maintain the complete combustion of the trash or garbage.*

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Proposed Tariff Changes - II

- MST 2.9 Definitions – I
  - *"Capacity resources that depend upon wind, solar energy or landfill gas for their fuel and that such dependence precludes accurate prediction of the facility's real-time output. Each Intermittent Power Resource that depends on wind as its fuel shall include all turbines metered at a single scheduling point identifier (PTID). Municipal Solid Waste Facilities in operation as of October 1, 2012 shall also be considered to be Intermittent Power Resources.*

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Proposed Tariff Changes - III

- **MST 15.3A.3 Exemptions (from Persistent Undergeneration Charges)**
  - ***"15.3A.3.4 Intermittent Power Resources that depend on landfill gas, solar energy or Municipal Solid Waste as their fuel;"***
- **MST 2.9 Definitions – C**
  - ***"Compensable Overgeneration: …***

    For a generator … which is an Intermittent Power Resource that depends on solar energy, landfill gas or Municipal Solid Waste for its fuel …"

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Next Steps

- **Bring proposed changes to BIC on September 20th**

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APPENDIX

(7/11/2012 BIC Presentation)

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NYCA Refuse Burners (2012)

MIS Generator Name	PTID	Max Winter Operating Limit	Max Summer Operating Limit
CH_MISC_IPPS	23765	9.8	9.8
ONONDAGA_REF_OCCRA	23987	32.4	32.5
NM CENTRAL___NUG	23634	3.4	3.8
PEEKSKILL____	23653	53.3	54
LIPA_MISC_IPP	23656	47.8	55.7
HEMPSTEAD____	23647	73.5	74
AMERICAN_REF_FUEL	24010	34.5	35.3
ADK RESOURCE___RCVRY	23798	11.8	11.8
	Total	**266.5**	**276.9**

Source of the list of generators with refuse fuel type: 2012 NYCA Generating Facilities
http://www.nyiso.com/public/markets_operations/services/planning/documents/index.jsp

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Current Market Participation

- **Three refuse generating facilities have already had their PURPA contracts expired**
- **Undergeneration penalties have been applied on all of the above facilities**
  - ***Penalty settlements has taken away 0.6% ~ 2.8% of the energy market revenue***

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Onsite Audit - I

- Visited on 6/20/2012
- Plant Process
  - *Regulated by the volume of garbage flowing into the boiler*
  - *Adjustments required every 20 ~ 30 min to keep the MSW flowing to achieve maximum output*
  - *Boiler operated to try and maintain a superheated steam flow of about 68,000 PPH to maximize the Elliott steam turbine efficiency*
- No short-term measures available to lift the output when a drop is observed

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Onsite Audit - II

- **Output Variation Observed**
  - ***While touring the control room, the plant output rose from 10.2 to 11.4 MW over 10 min***
  - ***The load drops much faster than it can come back up due to the thermal momentum of the boiler and turbine***
- **Long-term Fuel Availability**
  - ***Generally 700 to 1000 tons of MSW arrive each day***
  - ***Maintains about 5 ~ 6 days' supply of MSW in the pit at any time***

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Plant Characteristics Review

- **Refuse facilities' energy supply output is variable**
  - ***Their output is determined by the quality and quantity of the fuel***
  - ***Fuel quality is a large uncertainty (refuse type, moisture content, outdoor conditions)***
  - ***Burning of the refuse is managed to meet air quality standards***

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Variety of Fuel Quality

- **Refuse Type**
  - *Restaurant: food with significant liquids*
  - *Industrial: paper, cardboard, containers*
  - *Residential: mix of the above, batteries, small appliances (effected by local Recycling policies)*
- **Moisture Content**
  - *Increasing moisture content of the garbage will leave un-burnt garbage from the boiler, which reduces the potential power output*
- **Outdoor Conditions**
  - *Snow and ice result in increasing moisture content*

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Variety of Fuel Quantity

- **Environmental Obligation**
  - ***Meeting air quality standards and requirements is one principal concern for all refuse facilities***
  - ***Refuse facilities monitor emissions using Continuous Emissions Monitoring (CEM) system and manage the burning refuse to meet those standards***
- **Fuel Feeding Process**
  - ***Incoming trucks deposit the refuse into pits, where cranes mix and move it to the charging hopper to feed the boiler***

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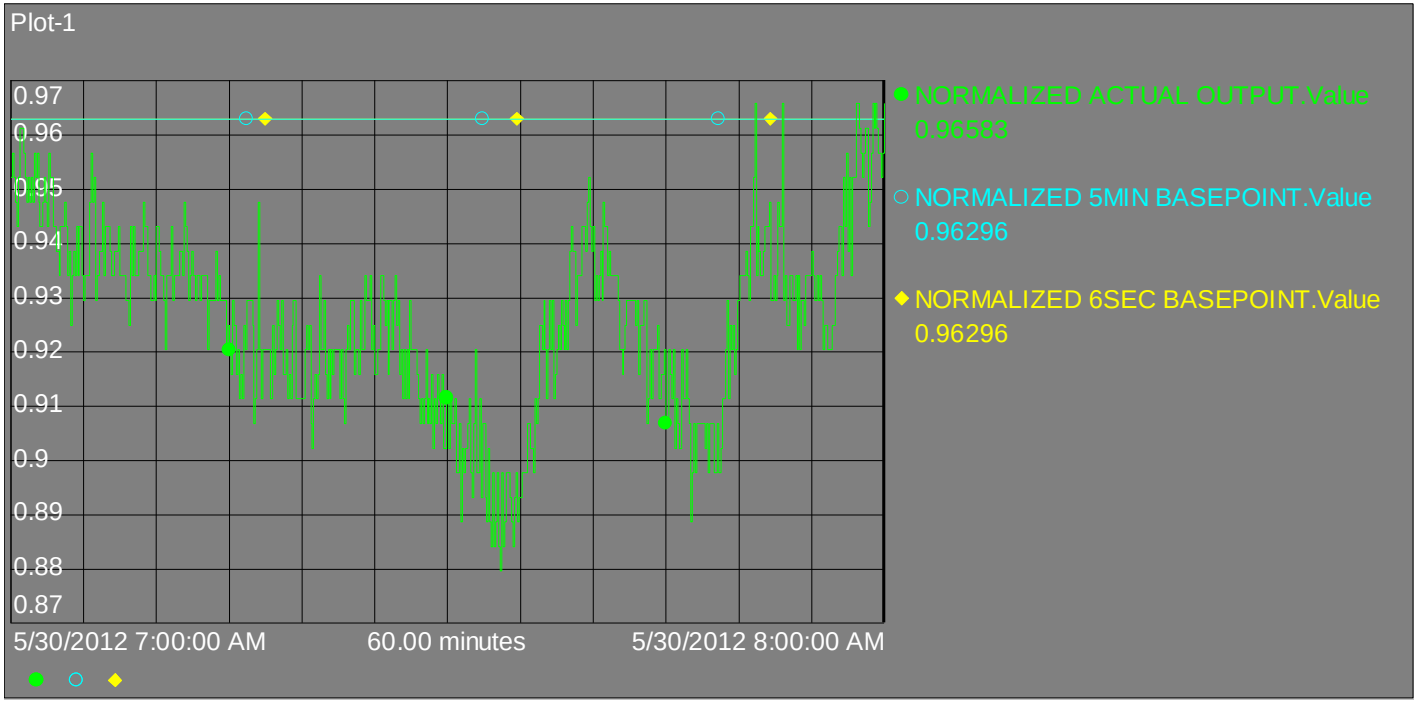
Actual Output Profile

- **Follow up the trends of AGC base points, with large variations**



Above: Historical generation output from a refuse burning generator in NYCA, with 5 min and 6 sec base points from the ISO. All values are normalized by the maximum operating limit.

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Dispatch Investigation

- None of the refuse generating facilities are currently receiving base points
  - *Local TO reason: "The units involved are not controllable so we do not transmit base points to them. Also they are not set up to receive base points. They are either on or off."*
- However, all of them consistently bid as either Self Committed Fixed or ISO Committed Fixed
  - *Indicating they wouldn't perform any better even if they were receiving base points*

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Performance Analysis - I

- **Variables to analyze**
  - ***Average actual energy output over an RTD interval***
  - ***Average ramped RTD base-point per RTD interval***
  - ***Control error tolerance for non-regulating units***
- **Correlation between actual energy outputs and RTD schedules**
- **Proportion of under/over generation**
- **Deviation of actual energy output**

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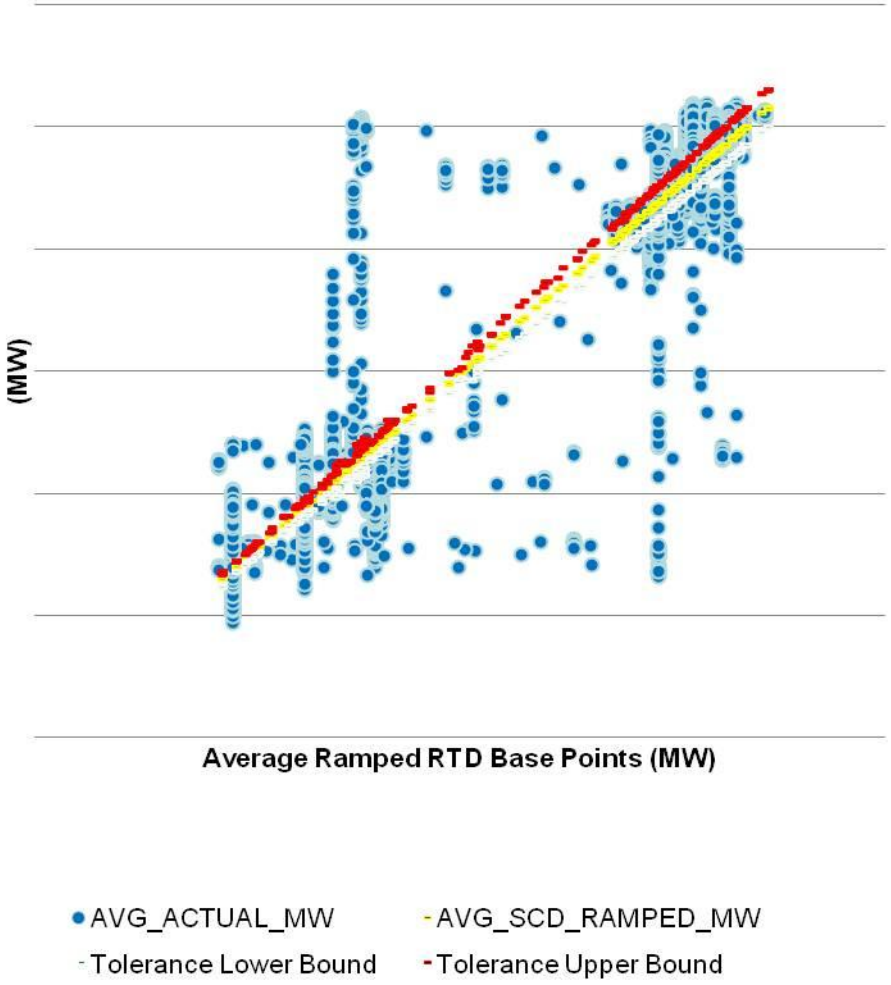
Performance Analysis - II

- ***Historical operations data between 02/01/2012 00:00:00 EST and 05/01/2012 00:00:00 EDT***

  (MW values are removed as market sensitive data)



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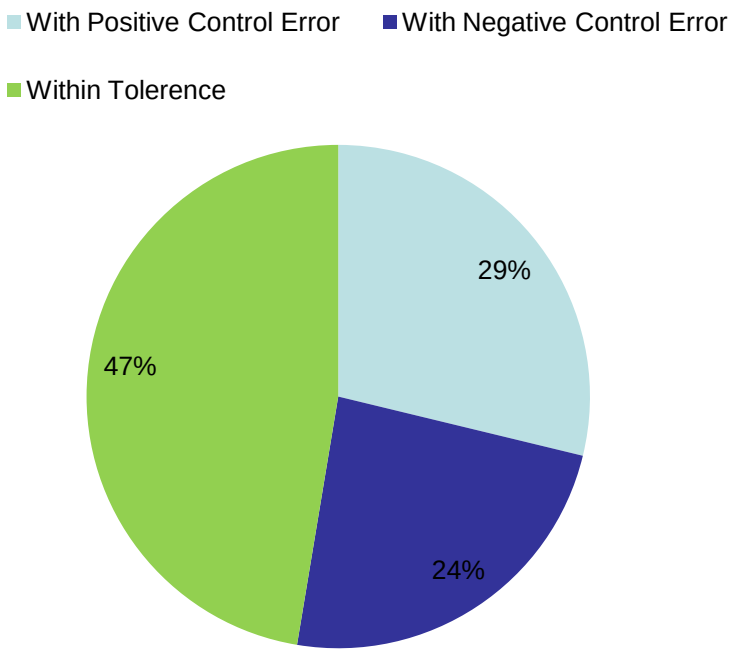
Performance Analysis - III

- **Subject to Persistent Undergeneration Charges for 24% of all RTD intervals without the exemption**



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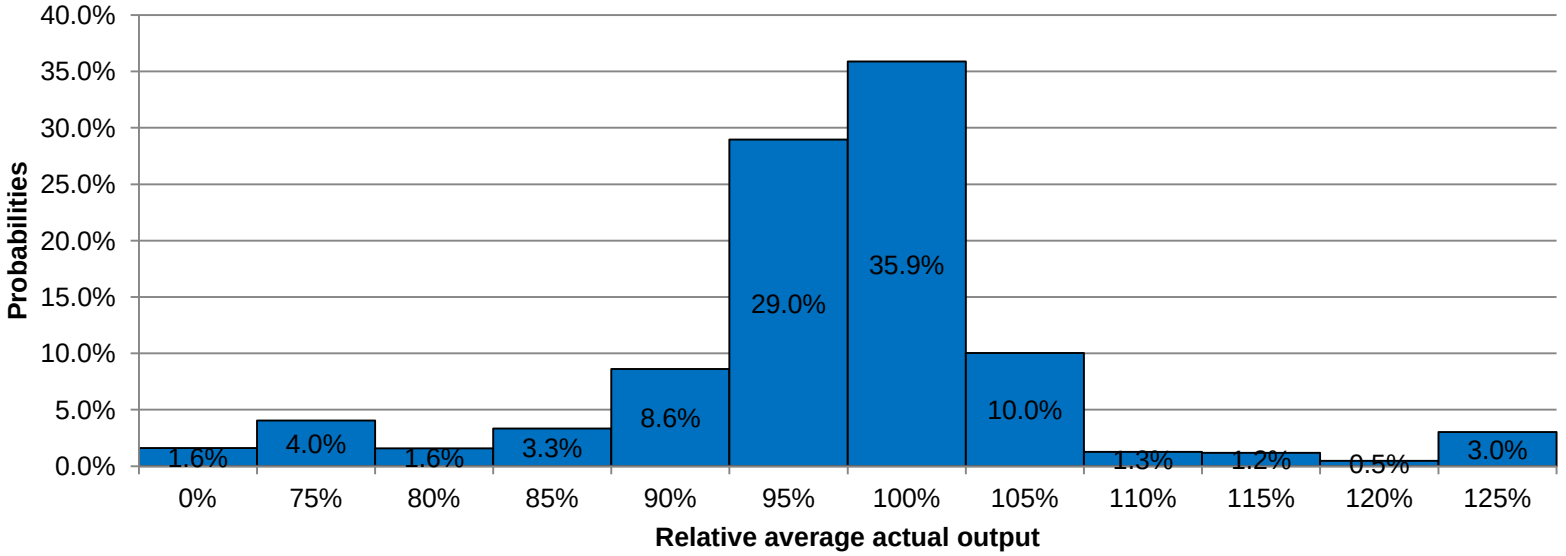
Performance Analysis - IV

- Relative actual output is defined as the average actual output divided by the average ramped RTD base point, by RTD intervals
- Standard deviation = 12.1%



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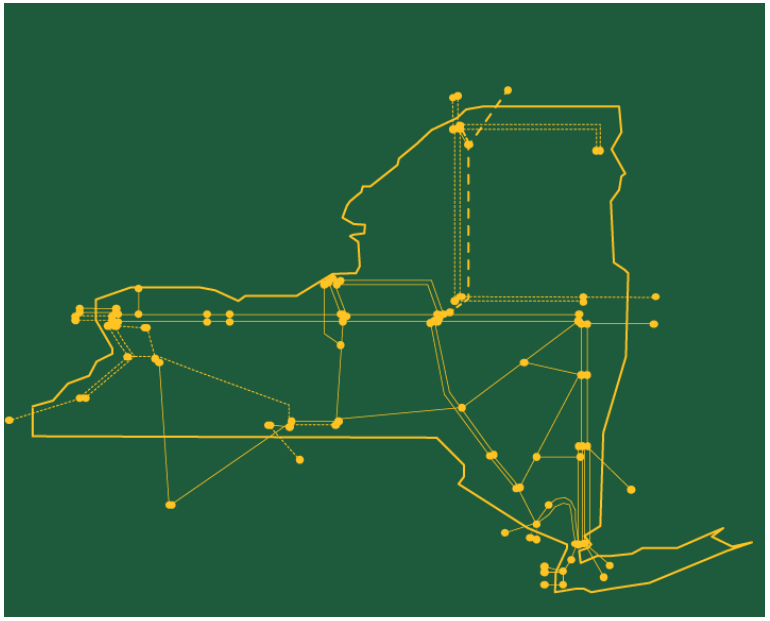

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