Fuel Constrained Bidding Market Rules

Cristy Sanada,
Associate Market Design Specialist, Energy Market Design
New York Independent System Operator

MIWG
February 23, 2016
Krey Corporate Center

Agenda

- Background and Design Overview
- Purpose of this discussion
- Eligibility Rules
- Bid Validation
- Bid Conversion to RT
- Settlements
- Next Steps

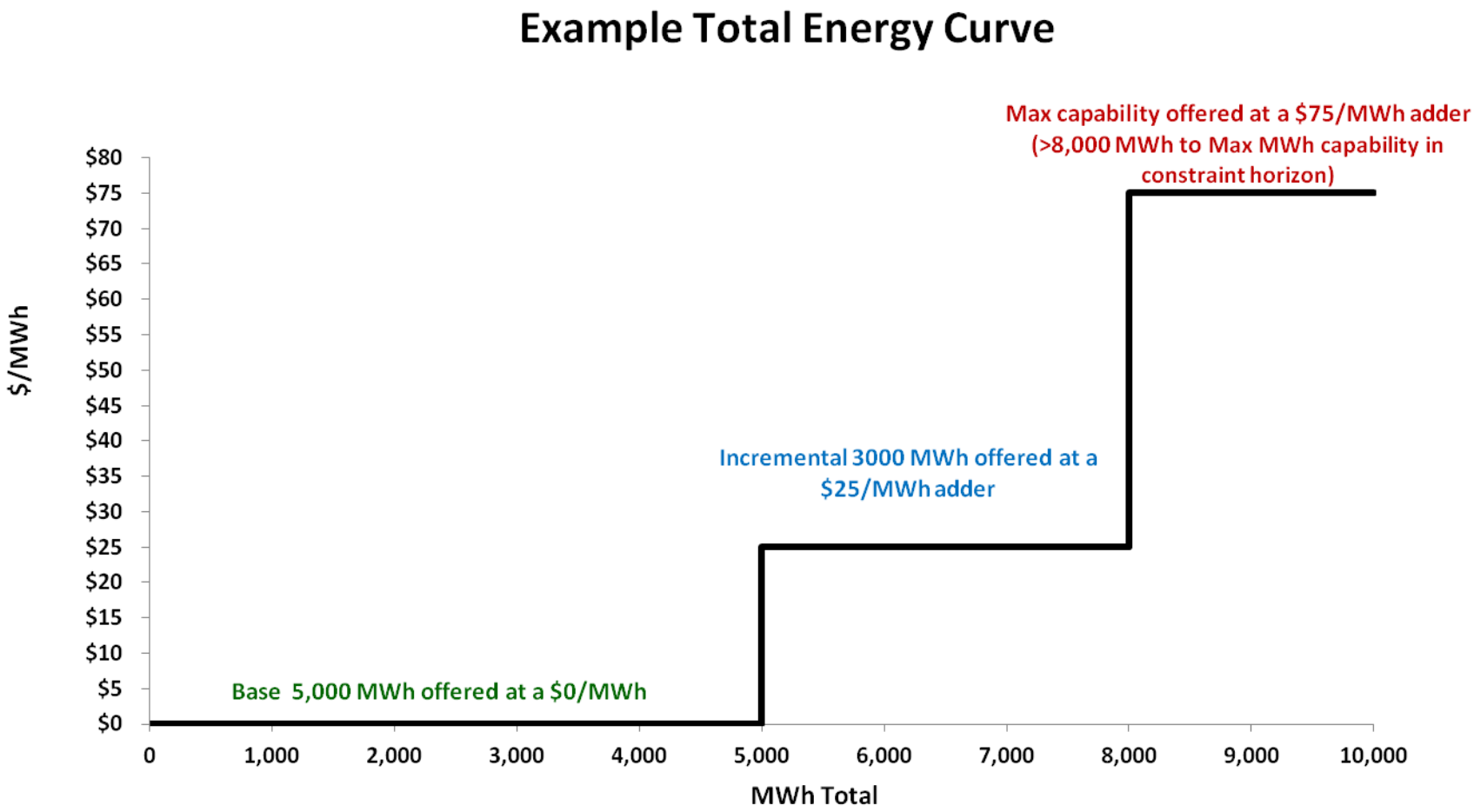
Background

- 2013 and 2014 State of the Market reports recommended allowing suppliers to submit offers that better reflect fuel supply constraints in the day-ahead market
- BIC approved Fuel Constrained Bidding market design in November 2015 (Total Energy Curve for a single generator and portfolio of generators)
- This is a project for 2016 with a Q4 FRS deliverable
- Implementation of this design is not expected until the 2019 timeframe, after the EMS/BMS upgrade completion

Total Energy Curve Design

- **Day-ahead bidding construct**
- **Functionality will be available year-round and is optional**
- **This design would allow the MP to submit for the electric day or subset of hours in the electric day:**
  - ***Hourly three-part bids for a generator or each generator in a portfolio***
  - ***A cost curve reflecting total energy capability in the timeframe (MWh) and additional cost to produce those MWhs ($/MWh) for the generator or portfolio, called the Total Energy Curve***
    - ***The Total Energy Curve is an "adder curve" or demand curve, reflecting incremental energy costs above base costs reflected in hourly bids***
- **This design will also allow resources flexibility to bid during anticipated OFOs, and allow resources to request a level schedule for a minimum specified MWh**
- **This design allows resources to reflect a constraint on energy output (MWh)**

Total Energy Curve Example



Total Energy Curve Bids	MWh 1	$/MWh 1	MWh 2	$/MWh 2	MWh 3	$/MWh 3
	5,000	$0	8,000	$25	10,000	$75

Note: Existing bid features will not change. Hourly three-part bids for each generator are still submitted in conjunction with this offer

Purpose of today's discussion

- **The purpose of today's discussion is to review the following market rule areas and proposed changes to support Fuel Constrained Bidding**
  - ***Eligibility Rules***
  - ***Bid Validation***
  - ***Bid Conversion to RT***
  - ***Settlements***

Eligibility

- **To use this functionality, individual resources and portfolios of resources must register as a Total Energy Curve Qualified Resource**
  - ***MPs may register resources in bulk for any foreseeable combinations of resources which may incur energy or fuel limitations***
  - ***Defined resources or portfolios of resources with energy limitations facilitates bid to bill tracking of the entity and the creation of reference levels***
  - ***NYISO will review requests to validate that the resources or groups of resources identified do face energy or fuel limitations***
- **If bidding as a portfolio (group of different PTIDs), all resources in the portfolio must be registered with the NYISO under the same bidding and billing entity**
- **If bidding as a portfolio, NYC resources may only be grouped with other NYC resources**
  - ***Different conduct thresholds and mitigation processes currently exist between NYC and Rest of State***
  - ***Resources in an NYC portfolio must all exist in the same load pocket, and same nested load pockets, if applicable***

Eligibility

- **A single resource may belong to only one approved entity/portfolio in a single electric day**
  - ***This rule will be established in this design phase in order for NYISO to gain experience with the deign and degree of usage in production***
  - ***A single resource belonging to more than one entity/portfolio in a day or in overlapping hours will result in extensive changes to downstream processes***

Bid Parameters/Bid validation

- **Existing hourly bid validation rules for three-part bids will not be modified**
- **All bid modes or a combination of bid modes, except bidding all gen-hours Self Committed Fixed, may be used with fuel constrained bidding**
  - ***Price-taking MWhs should not introduce costs into the optimization***
- **The following bid validation rules will be enforced for offers with a Total Energy Curve associated:**
  - ***SUM(Hourly Self Committed MWh) must be priced at $0 on the total energy curve since these are intended to be self-offered, price-taking MWs and should not have a cost associated***
  - ***Last point of the Total Energy Curve must be greater than or equal to:***

    SUM(Hourly UOLe) for ISO Flex/ISO Fixed/Self Flex hours +
    SUM(Hourly Self Committed MWh) for Self Fixed hours

  - ***In other words, the total MWh reflected on the Total Energy Curve must fully reflect available MWhs reflected in hourly offers***

Bid Parameters/Bid validation

- **The following validation will be enforced for offers with a minimum level MWh:**
  - ***The min MWh specified must be less than or equal to the total resource or portfolio capability any hour covered by the constraint***
- **Total Energy Curve offer will allow up to 11 price-quantity pairs**
- **Any combination of sums of cost offers on the Total Energy Curve and hourly energy offers curve shall not exceed the offer cap or be below the negative offer cap**
  - ***There will also be a +/- $1000/MWh cap on the individual TEC offers***
  - ***The +/- $1000/MWh cap on the individual Incremental Energy and Min Gen Rate offers will still exist (Min Gen Rate is calculated by MIS)***

Bid Conversion to RT

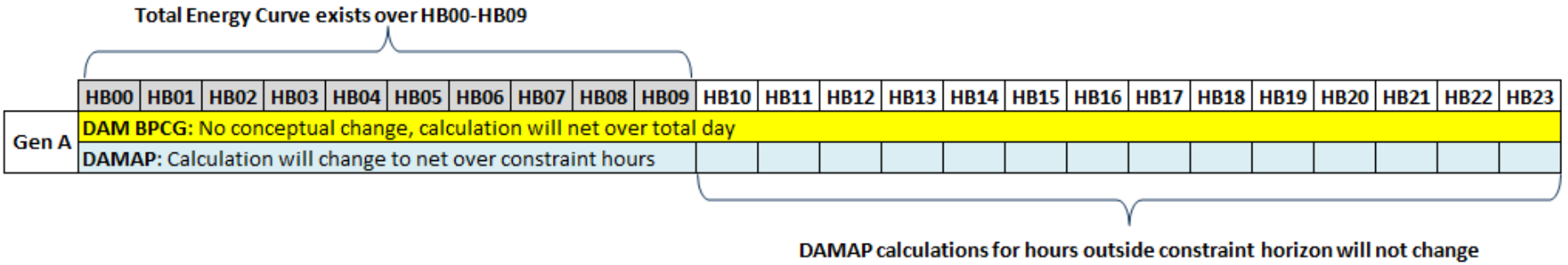
- **Whether or not an adder cost is incurred based on a resource's or resources' DAM schedule, DAM bids will be converted to RT bids with no additional adders**
- **MPs will be responsible for updating RT bids to reflect different costs than DAM bids if necessary**
  - ***Existing RT hourly bid validation rules will still apply to all real-time hourly bid updates***
  - ***DAMAP eligibility rules associated with increasing bids in real-time will be modified to account for this reflection of DAM incurred costs into RT bids***
  - ***DAMAP eligibility will be discussed in subsequent slides***

Settlements – Concept of Portfolio Settlements

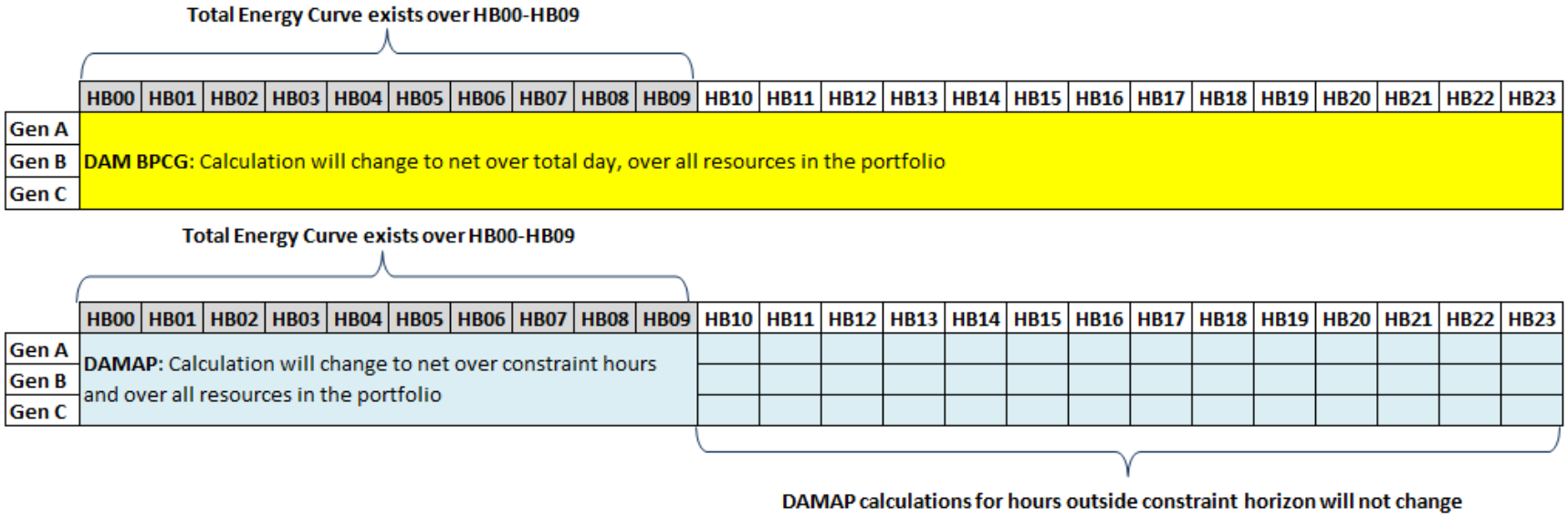
- **If a single resource submits a Total Energy Curve, hours covered by the constraint will be used to calculate net settlements**
  - ***This change will impact DAMAP calculations***
  - ***DAM BPCG remains a daily net calculation for the single resource***
- **If resources are bid as a portfolio in the market day, costs are linked together through the inter-temporal offer and net settlements will center around the grouped entity**
  - ***This change will impact DAMAP calculations***
  - ***DAM BPCG will remain a daily calculation, but will be netted over all resources in the portfolio***

Settlements – Concept of Portfolio Settlements

- **Single resource bidding with a Total Energy Curve**



- **Portfolio of resources bidding with a Total Energy Curve**



Settlements – Concept of Portfolio Settlements

- **DAM BPCG Eligibility**
  - ***Existing BPCG eligibility logic will still be assessed across individual resources bid under an inter-temporal constraint***
    - **Currently, if a single resource is committed in the DAM in any hour as a result of a Self Committed Fixed or Self Committed Flex bid, the resource is ineligible for a DAM BPCG payment**
  - ***In a portfolio, if any individual resource BPCG eligibility criteria is not met, the portfolio will be ineligible for DAM BPCG for the market day***
    - **Costs are now linked across resources through the multi-hour, multi-unit offer**

Settlements – Concept of Portfolio Settlements

- **DAMAP Eligibility**
  - ***DAMAP eligibility rules will be modified to account for multi-hour and multi-unit offers***
    - **If a single resource meets any of today's criteria (where increasing bid cost criteria will be modified for resources bidding a Total Energy Curve as described below) defining DAMAP ineligibility in a single gen-hour, all gen-hours in the constraint horizon will be ineligible for DAMAP**
  - ***The DAMAP eligibility rule pertaining to increasing bid costs on scheduled MWs will be modified so that resources in the portfolio can increase costs on DAM scheduled segments of the Incremental Energy Curve and maintain DAMAP eligibility as long as:***
    - **Any single increase in bid cost does not exceed the max adder $/MWh incurred in DAM**
    - **Any total increase in bid cost on all constraint hours for scheduled segments does not exceed the total bid cost incurred in DAM from the Total Energy Curve**
    - **If the portfolio does not meet either of the above criteria the resource will be ineligible for DAMAP for the constraint horizon and +/- 2 hours surrounding the constraint horizon**

Settlements- Open Items

- **When applicable, adder costs will be prorated to reliability-committed hours to appropriately calculate uplift and determine local and statewide allocation of uplift**
  - ***Proposed methodologies to be discussed at subsequent MIWGs***
- **Multi-hour, multi resource settlements will impact existing invoicing and DSS structure**
  - ***NYISO is requesting MP feedback***

Next Steps

- **Currently soliciting MP feedback**
  - *Please e-mail any questions or comments to csanada@nyiso.com*
- **March - April**
  - *Continuation of discussions on market rules*
  - *Present findings of fuel cost and efficiency curve design research*
- **Q2-Q3 2016**
  - *Tariff language development*
  - *BIC Vote on Market Design and Tariff Language*
- **Q4 2016**
  - *Draft and approve functional requirements*