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Sent: Monday, September 28, 2009 12:36 PM
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Cc: david_drexler@dps.state.ny.us; George Bacon; Andrew Bazinet; John H. Paul
Subject: Case 08-T-1245: Article VII Application of Bayonne Energy Center
Attachments: Pure Energy Final Factor Inputs 28Sep09.pdf

In follow-up to our teleconference on Friday, September 29, 2009, attached is a document setting out the assumptions underlying the Dispatch and Environmental Analysis provided by Bayonne Energy Center in Support of its Article VII application.

Regards,

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Factor Inputs

- Load forecast
  - 2012 peak and annual energy with energy efficiency (EE) impacts
  - Two New York load forecasts modeled
- Resource Additions and Retirements
- Transmission Topology
  - Transfer limits within and between zones (including NYC sub-zones)
- Fuel Price Forecast
- Emission Allowance Price Forecast
- Simulation Model
  - MarketSym to forecast dispatch, energy prices, & emissions by zone
- Study Objectives
  - Calculate changes in 2012 market energy costs and power plant emissions

Two Load Forecasts – NYISO

- NYISO 2009 Gold Book
  - 2012 forecast with and without EE impacts
  - LAI adopting load forecast with EE (approx. 1/3 of state target)
  - Emergency Demand Reduction Program modeled as generation

- Historical Average Load Growth
  - Higher growth (~1%) based on historical average load growth

		Zone J	NYCA
LAI: NYISO with EE	Peak (MW)	12,170	33,906
	Energy (GWh)	54,864	166,221
NYISO without EE	Peak (MW)	12,391	34,652
	Energy (GWh)	57,646	171,935
LAI: Hist. Avg. Growth	Peak (MW)	12,307	34,988
	Energy (GWh)	56,104	169,555

Load Forecast – ISO-NE

- ISO-NE 2009 CELT Report
  - Provided without peak load reductions
  - LAI reduced CELT forecast 2% for EE initiatives
  - Demand Response resources modeled as generation

LAI: CELT with EE	Peak (MW)	28,440
	Energy (GWh)	131,335
CELT without EE	Peak (MW)	29,020
	Energy (GWh)	134,015

Load Forecast – PJM

- PJM 2009 Load Forecast Report
  - MAAC+APS region modeled (not PJM west & south)
  - LAI reduced PJM load forecast 2% for EE initiatives
  - Direct Control Load Management and Interruptible Demand modeled as generation

LAI: PJM with EE	Peak (MW)	70,727
	Energy (GWh)	357,011
PJM Load Forecast	Peak (MW)	72,170
	Energy (GWh)	364,297

Additions and Retirements – NYISO

- Information from the 2009 RNA base case
  - Astoria Energy Phase II in-service 2011
  - 2084 MW of Special Case Resources (622 MW in NYC)
  - NRG repowering (June 2012) and Cross Hudson / Bergen 2 CC (June 2012) not included

	Zone	2009	2010	2011	2012
Caithness Long Island CC	K	310			
Riverbay Cogen	J	45			
Empire (Besicorp) CC	F		660		
Poletti dual fuel ST	J		-890		
Blenheim-Gilboa Unit 1, 3 & 4 Pumped Storage	F	30	30	30	
Nine Mile Point Pt. 2 Nuclear	A-E			168	
Astoria Energy II CC	J			557	
Wind (*nameplate*)	A-E	280	299	399	*

** 2012 wind assumed in service after summer peak so effectively zero.*

Additions and Retirements – ISO-NE

- Information from Forward Capacity Auction #2
  - Supplemented with filings for Forward Capacity Auction #3

	Zone	2009	2010	2011	2012
Ansonia Cogen	SWCT		61		
Cos Cob 13 & 14 GT	NOR	37			
Kleen Energy CC	CT		593		
Millstone 3 Nuclear	CT		80		
Waterbury GT	SWCT	94			
Devon LM6000 GT	SWCT		194		
Middtwn LM6000 GT	CT			194	
New Haven LM6000 GT	CT				130
Demand Response	n/a	440	1091	499	
Wind (*nameplate*)	n/a	136	236	212	*

** 2012 wind assumed in service after summer peak so effectively zero.*

Additions and Retirements – PJM

- PJM: Information posted for 2012/13 Base Residual Auction
  - 1996 MW of Direct Control Load Management throughout

	Zone	2009	2010	2011	2012
Indian River 1 & 2 Coal	PJME		-91	-91	
Benning 15 & 16 ST	SWMAAC				-550
Buzzard Pt East1 & West1 ST	SWMAAC				-256
Hope Creek 1 Nuclear	PJME		70	30	
Susquehanna 1 & 2 Nuclear	PJMC		86		
Essex GT	PJME			160	
Kearny GT	PJME			132	
Perryman GT	SWMAAC			300	
Riverside ST	SWMAAC			78	
Longwood Coal	APS		530		
Generic GT (*for reliability*)	*as required*				2440
Delta CC	PJME			545	
Wind (*nameplate*)	APS&WMAAC	368	411	228	*

** 2012 wind assumed in service after summer peak so effectively zero.*

Additions and Retirements – Renewables

- New renewable generation added
  - Based on states' Renewable Portfolio Standards, not reliability criteria
  - We assume a national Renewable Energy Standard, if implemented, will not be a major influence on renewables in the Northeast
- Type and location of new Class 1/Tier 1 renewable capacity
  - Predominantly wind additions based on current projects in queue
  - Other tiers/classes not significant and not explicitly modeled

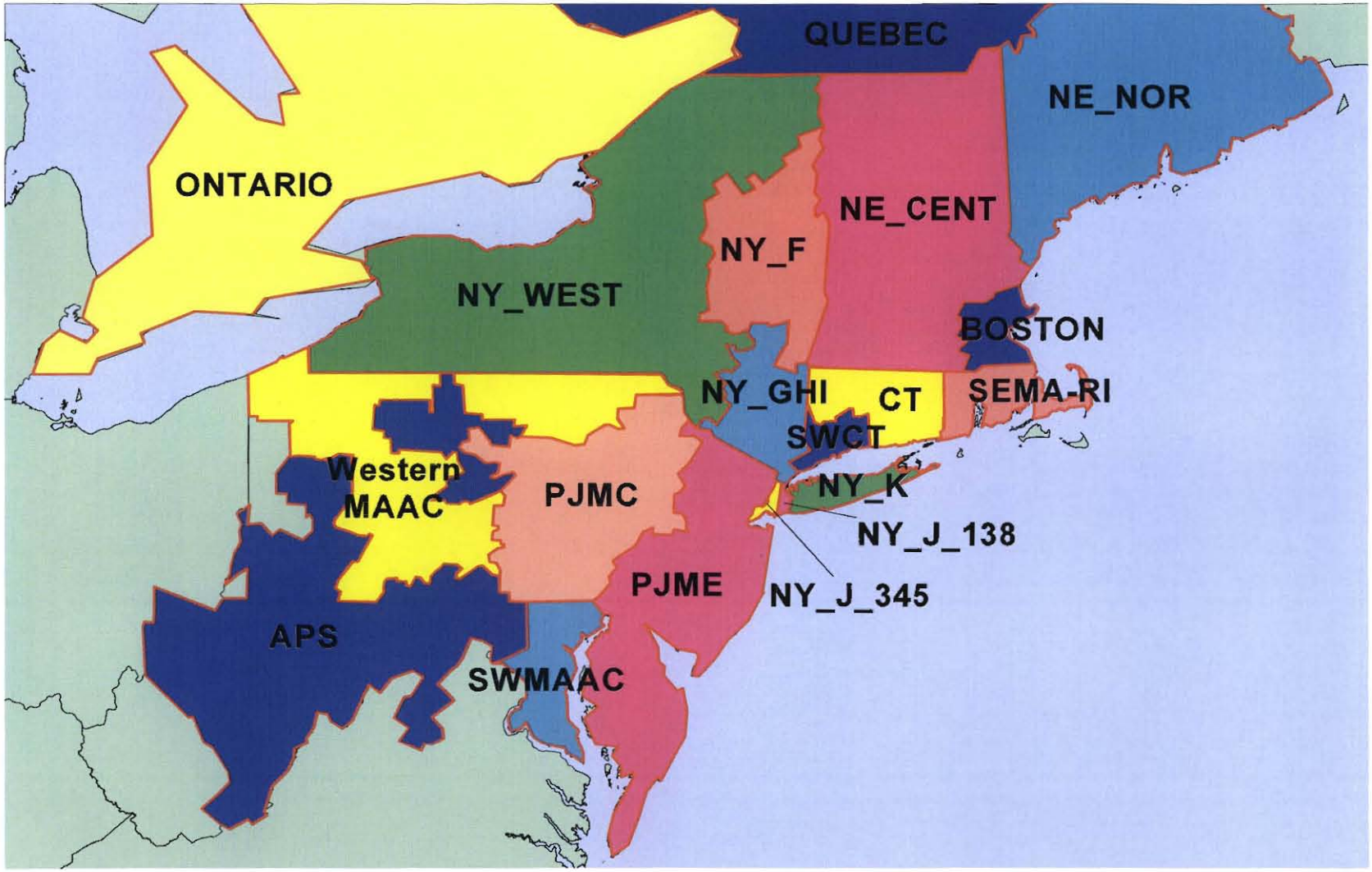
Transmission Topology – Transfer Limits

- Transfer limits updated to reflect latest ISO-published data
- NYISO: 2009 Reliability Needs Assessment
  - ConEd M29 cable will increase transfer capability from Zone I to Zone J by 325 MW to 4400 MW
  - Linden VFT into Zone J of 300 MW (energy only)
- ISO-NE: PAC Meeting of March 31, 2009
  - Transfer limits for transportation models (e.g. MarketSym)
- PJM: RPM Planning Parameters for 2011/12 & 2012/13
  - TrAIL (502 Junction – Loudoun) in 2011
  - Susquehanna – Roseland in 2012
  - Other backbone projects (MAPP, PATH, etc.) after 2012

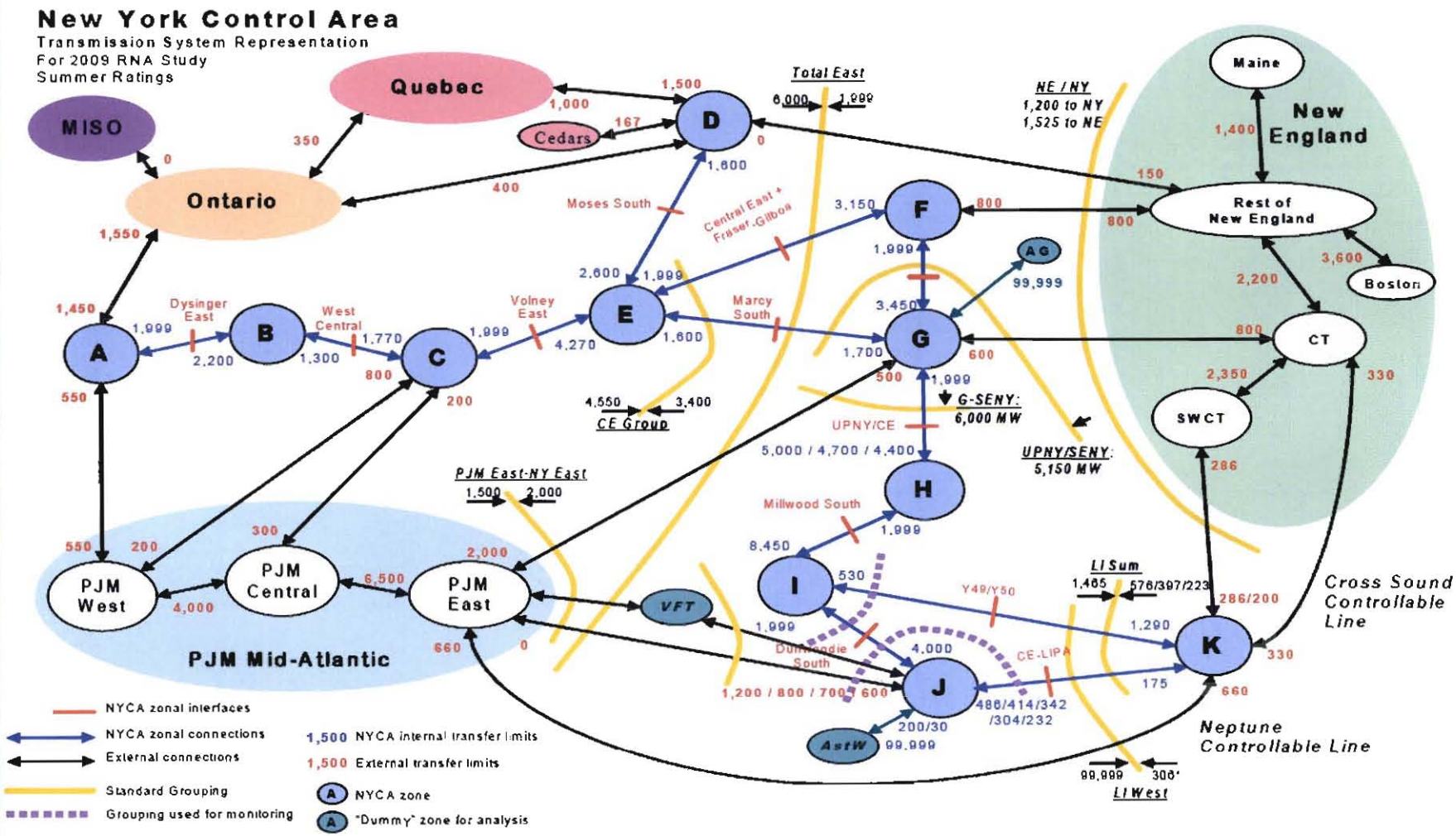
Transmission Topology

- NYISO modeled as six zones:
  - NY-West, F, GHI, J 138kV, J 345kV, and K
- ISO-NE modeled as six zones:
  - Boston, CT, SWCT, SEMA-RI, NE-NOR, and NE-Central
- PJM modeled as five zones within MAAC + APS:
  - PJME, PJMC, PJMW, SWMAAC, and APS
- Quebec and Ontario for imports / exports

Transmission Topology



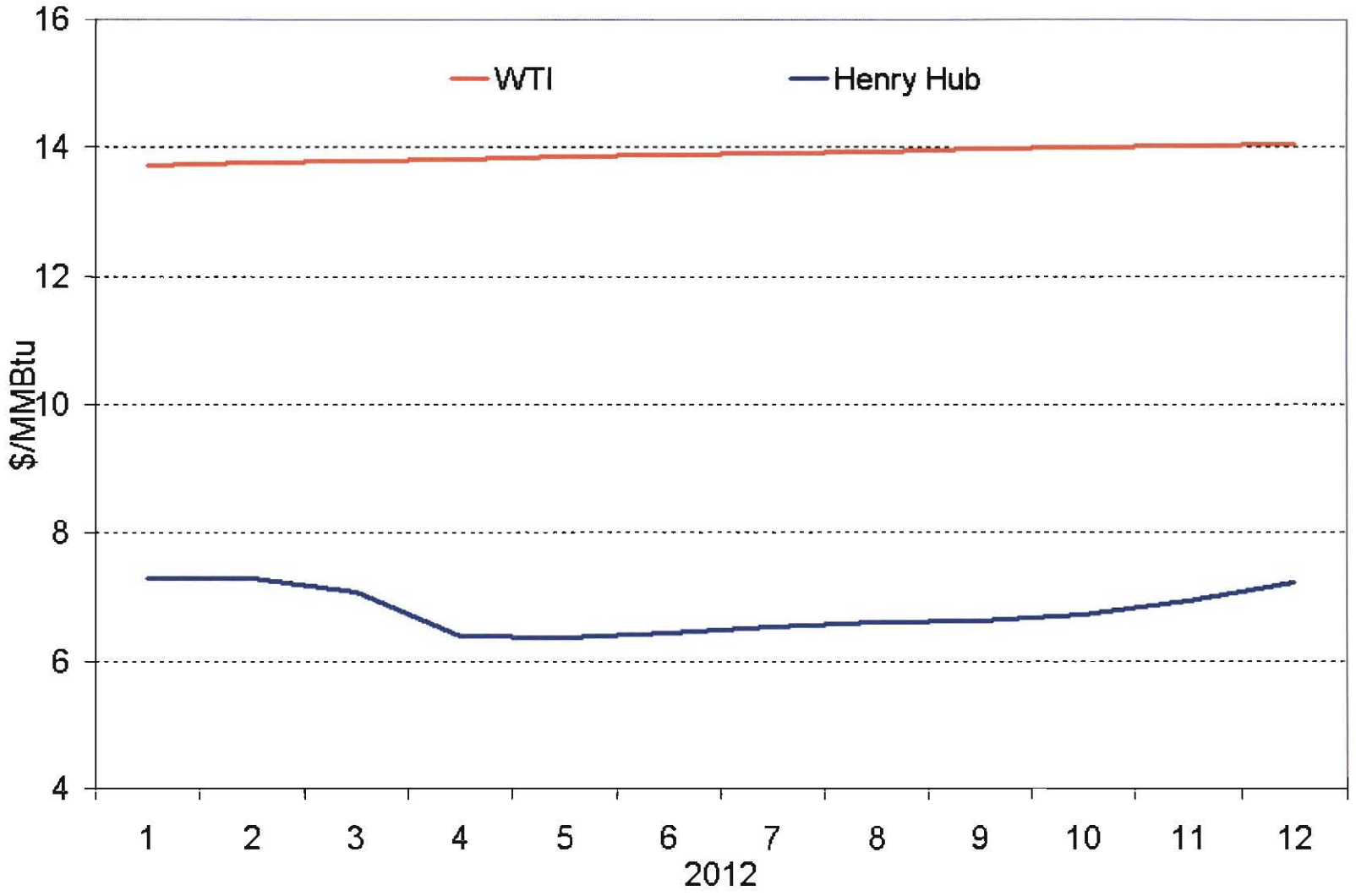
Transmission Topology – NYISO Interfaces



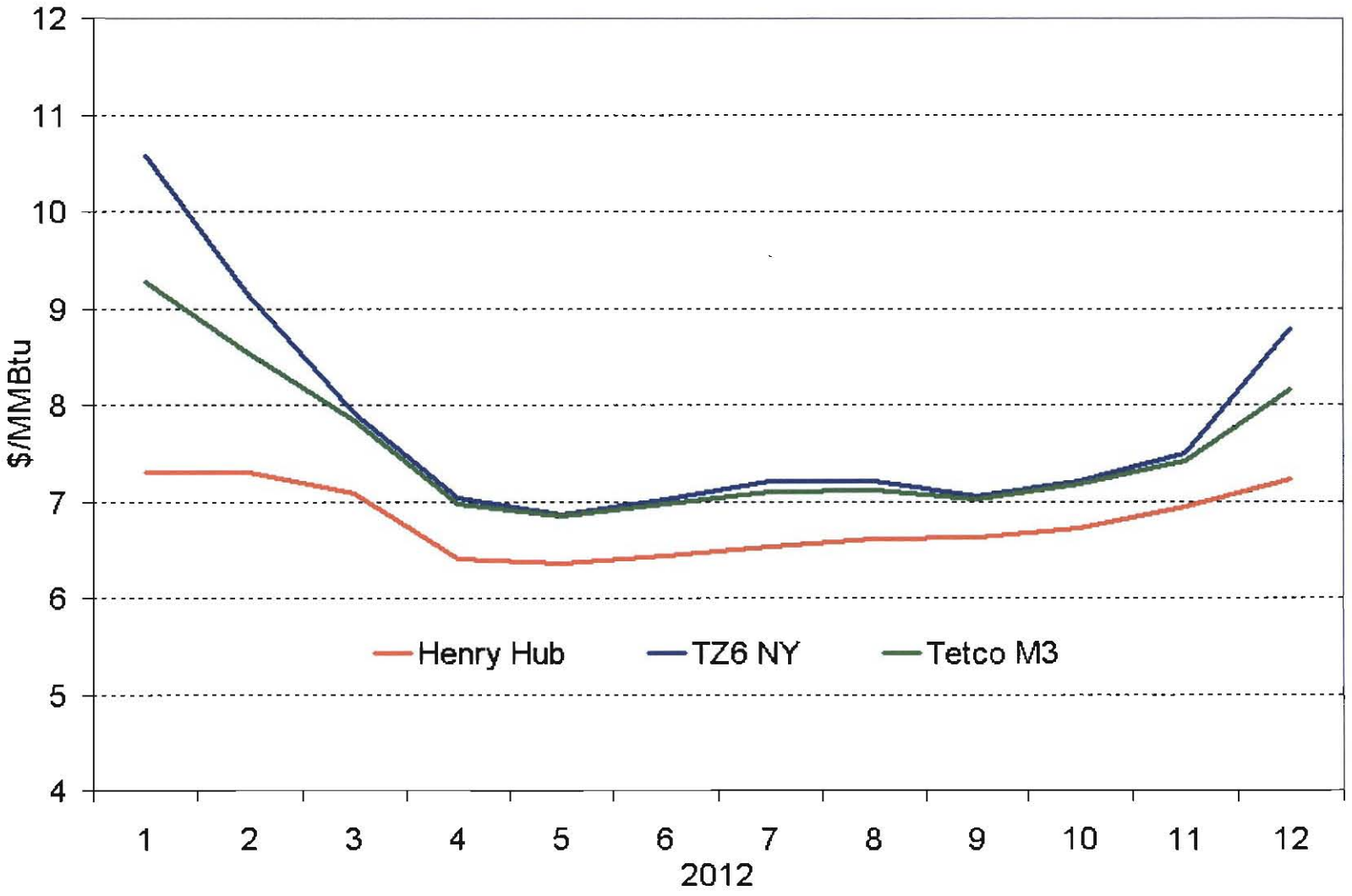
Fuel Forecast

- Henry Hub gas price from NYMEX forward curve
  - Basis adders for key pricing points (Transco Zone 6, etc.)
  - Available basis swaps used for calibration
  - LDC adders as required (25¢ winter / 10¢ summer, etc.)
- Oil prices based on NYMEX crude oil forward curve
  - West Texas Intermediate (WTI) is NYMEX crude benchmark
  - Linear regression to derive ultra-low sulfur distillate (ULSD), No. 2, and No. 6 oil product prices
  - Delivery costs added as required
- Coal prices forecast using proprietary cost-based model
  - Central Appalachian (CAPP) and Powder River Basin (PRB) prices based on NYMEX forward curve
  - Northern APP (NAPP) and Illinois Basin (ILB) prices per LAI forecasting model
  - Delivery costs based on historic data

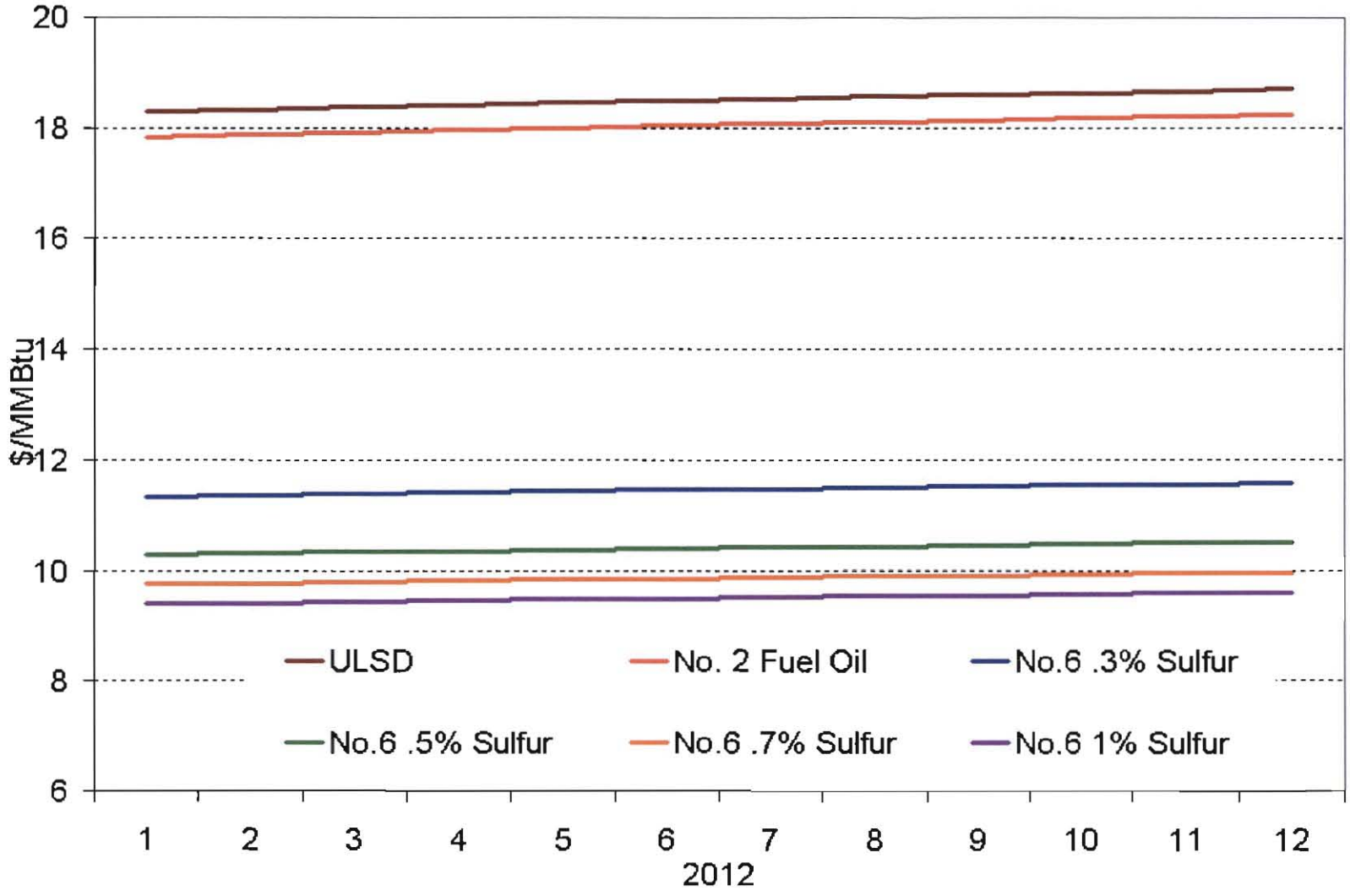
Fuel Forecast – Underlying NYMEX Forwards



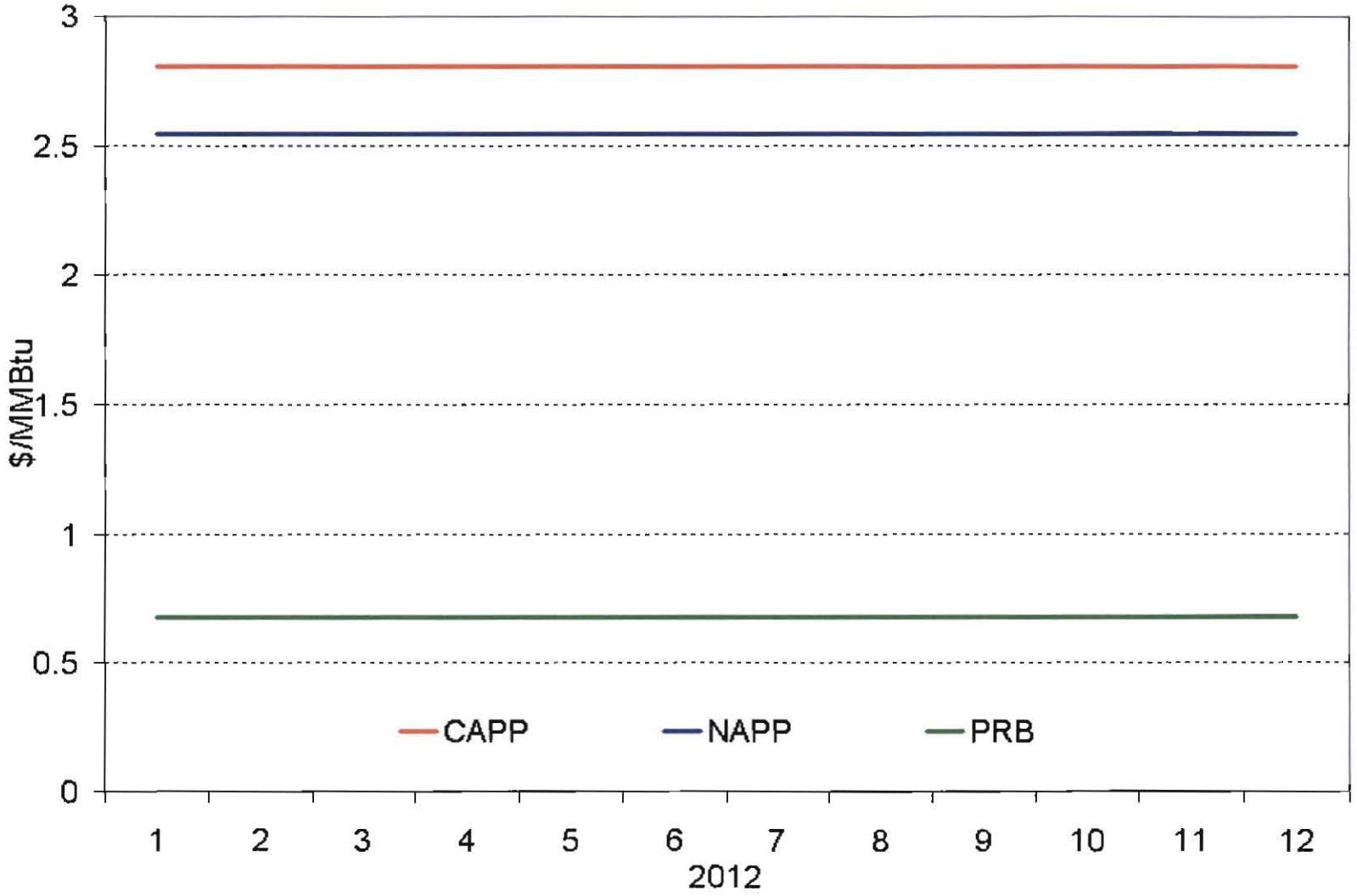
Fuel Forecast – Gas Prices



Fuel Forecast – Oil Products



Fuel Forecast – Coal Prices



Emission Allowances – Carbon Cap & Trade

- Regional Greenhouse Gas Initiative (RGGI)
  - Implementation date: Jan. 1, 2009
  - CT, DE, ME, MD, MA, NH, NJ, NY, RI, and VT
- Some 2012 vintage allowances have been auctioned, but price reflects low demand and legislative uncertainty
  - RGGI Auction 3 (3/18/08) $3.05/ton
  - RGGI Auction 4 (6/17/09) $2.06/ton
- If HR2454 enacted, federal cap & trade to begin 2012
  - Narrowly passed in House; Senate action in fall; outlook uncertain
  - EPA model forecast $12/ton in 2012, about $2 above reserve price
  - RGGI allowances could be exchanged at prior auction clearing price
  - LAI will use a risk-adjusted CO_2 allowance price of $6/ton

Emission Allowances – SO_2, NO_x

- SO_2 Allowance Price
  - Based on EvoMarkets forward price curve
  - 2012 price approx. $41/ton
  - Reflects current oversupply of banked allowances

- NOx Allowance Price
  - Extrapolated from EvoMarkets quotes for prompt 2 year vintages
  - Seasonal (State Implementation Plan / SIP) approx. $150/ton
  - Annual (Clean Air Interstate Rule / CAIR) approx. $250/ton

Energy Price Forecast

- 2012 forecast will use MarketSym
  - Include known generation additions and retirements
  - Transmission interfaces to calculate hourly LMPs by zone
  - Multiple gas transport bases across region
  - Variable costs include emission allowance prices

- Unit-specific commitment logic, dispatch restrictions
  - Three-part bid structure (start, min load, incremental energy costs)
  - Bid production cost guarantees (uplift payments)
  - Min load, min run time, min down time, etc.
  - Commitments to provide spinning reserve

Study Objectives

- Calculate changes in 2012 market energy prices and emissions due to Bayonne
  - Present results for Zone J, NYCA, and PJME
  - Change in market energy prices *when Bayonne dispatched*
  - Zone J hedged supply contracts not factored into market price effects calculation
  - Changes in CO_2, SO_2, and NOx power plant emissions